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Triggers of innovativeness in publicly and privately driven agricultural value chains: Case study of cocoa and pineapple in Ghana

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Abstract

This paper uses the multiple case study design approach to assess situations under which actors in the cocoa and pineapple value chains show evidence of innovativeness. Open-ended interviews were conducted with a range of actors in the two case studies. A survey of small-scale pineapple and cocoa farmers was also conducted in the two respective study areas, Akuapem South District and the Tafo Cocoa District, to triangulate findings from the qualitative data. The results showed how private sector leadership in value chain functions and service provision had promoted choices and created more space for complex systems of interactions and learning behaviours for actors to translate their challenges into innovative activities. The paper concludes that the capacity of actors in the value chains to exhibit innovativeness is a function of their resourcefulness and the quality of value chain linkages. The implications for policy are that a gradual reduction in public sector participation in value chain functions and support services and a steady expansion of the space for the participation of private sector actors such as processors, and input suppliers, may hold the key to building the capacity of actors to show more evidence of innovativeness to become more competitive.

Keywords: Innovativeness; triggers; cocoa; pineapple; value chains; publicly and privately driven

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1. Introduction

The literature on agricultural development discusses various models of ensuring innovation. The emerging debate has focused attention on models that will guarantee the kind of innovativeness necessary to make agricultural industries more competitive. The history of innovation started from the popular linear models, exemplified in the Technology Supply Push Model (Roling, 2010; Miller and Cox, 2006; Rogers, 2003; Clark et al., 2003; Chambers et al., 1989) and the Market Propelled or Induced Model (Roling, 2010; Roling et al., 2004; Newell et al., 1979; Hayami et al., 1985), then to a long debate on Farmer-driven Innovation (Millar, 2005; Roling et al., 2004; Rey and Water Bayer, 2001; Van de Ploeg and Long, 1994) and participatory approaches such as the Participatory Technology Development Model (Roling, 2010; Kotler and Andrease, 2003; Campbell and Salagrama, 2000; Biggs, 1989; Chambers and Jiggins, 1987). The discussion has taken a new dimension to Interactive Models of Innovation and more recently, to Innovation Systems Perspective and Convergence of Sciences (Spielman et al., 2009; Hall et al., 2006; Van Huis et al., 2005; Leeuwis, 2004; Nederlof, 2006). The debate appears to be gathering more momentum as we progress towards an increasingly globalised economy. However, in spite of the amount of work done in the area of innovation studies and innovativeness, in particular, the fact remains that the dynamics of innovative activities in the agricultural sector are far from being fully understood.

This paper adopts, the methodological framework for the agricultural innovation system developed by Hall et al. (2006), which proposes that the capacity for continuous innovation in a given agricultural commodity value chain is a function of *linkages*, *working practices* and *policies* that promote knowledge flow and learning among all actors within the chain. Using the multiple case study design approach, the study examines the cocoa and pineapple value chains in Ghana with a view to gaining in-depth understanding of how the policy environment promotes public or private sector leadership in an agricultural industry and how that leadership triggers innovativeness in agricultural commodity value chains.

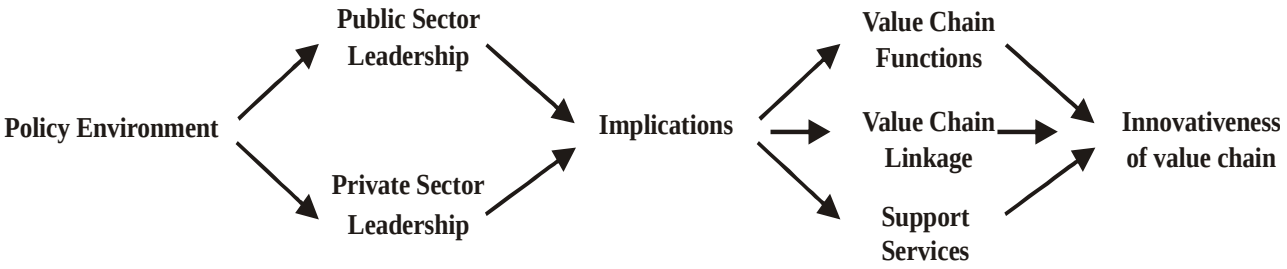

Figure 1. Model Showing how the Policy Environment Promotes Innovativeness in an Agricultural Commodity Value Chain (Source: Fieldwork 2011)

Conceptually, the study makes the assumption that actors in agricultural commodity value chains do face challenges in the course of executing value chain functions, requiring that such actors develop the capacity to respond to these challenges. This capacity of actors is conceptualized by this paper as innovativeness. The assumption is that the existing policy environment may promote private sector leadership or public sector leadership, which may influence value chain functions (production, input supplying, processing and

marketing), the nature of linkages (vertically or horizontally) among value chain actors and the provision of support services (extension support, research and development, financial etc) to the value chain and consequently, the innovativeness of actors. This is visually presented in Figure 1.

Policy support for innovation, according to Mytelka (2000), is not the outcome of a single policy, but a set of policies that work together to shape innovative behaviour. This means there is a need for a wide range of policies that affect innovation and seek ways to coordinate these policies. Furthermore, habits and practices and institutions interact with policies. Therefore to design effective polices, it is necessary to take into account the habits and practices of actors (Mytelka, 2000). Hall et al. (2006), in reinforcing this point, note that the introduction of more participatory approach to research is often ineffective unless the habits and practices (and incentives) of scientists are also changed. To them, the habits and practices so critical to innovation are themselves learnt behaviours which shape approaches and arrangements and which are continually changing in both incremental and radical ways.

Policies, on the other hand, can encourage innovations by providing the desired incentives, resources (including new knowledge from research) and support structures (education, financial system etc). In doing an analysis of the agricultural innovation system, Hall et al. (2006) note that it is necessary to examine the impact on farmers and other actors of policies that directly affect the agricultural sector (agricultural research and extension arrangements), as well as of policies that are designed to affect the inputs to the sector (industrial policies and education policies), the incentives to producers and to companies (tax policies, land use policies, transport policies, tariff policies) as well as policies that affect the opportunities for learning and competition in the domestic market (intellectual property rights, foreign investment policies). Additionally, Hall et al. (2006) note that policy changes in the global environment will impact on local innovation systems; and international market structures, new rules and discipline being negotiated at the WTO and in other bodies will also shape the parameters within which choices about learning, linkages and investment will be made.

A case study from Ghana as cited by Rajalahti et al. (2008), describes how pineapple exports developed in response to improved market opportunities. Policies that favoured market liberalization and improved availability of finance enabled entrepreneurs to invest in pineapple export. The enabling environment is considered an important promoter of innovation capacity, as such; it influences how the actors in a sector can put this knowledge to use. However, according to Rajalahti et al. (2008), an enabling environment alone may not be sufficient when the sector is not well coordinated and when attitudes and practices among actors work against it. Evidence suggests that even when an enabling environment exists, the range of actors and the attitudes and practices in a sector may constrain the development of sustainable innovative capacity in a more fundamental manner. This school of thought suggests that policy interventions aimed at creating an enabling environment for innovations may often be ineffective if they are not accompanied by efforts to change prevailing attitudes and practices (World Bank 2006).

Policies have to be coordinated because there is no one innovation policy, but a set of policies must be relevant to the local context and the habits and practices of actors whose behaviour the policies are designed to influence (Hall et al., 2006). Value chain actors adopt certain behaviours and practices, and forge linkages

and networking depending on the implications of the policy environment, which also determine their capacity to respond to challenges, i.e., innovativeness.

Actors may be more or less dependent on the research and extension system, they may be more or less aggressive in searching for viable options to addressing challenges, they may exhibit more or less creativity, or they may be more or less conscious about quality issues depending on the influence of the prevailing policy environment. Besides, actors may also engage in certain practices as a result of the implications of the policy environment. They may engage more in the activities of associations and groupings as a way of sharing useful information, pooling resources or ideas together to address common challenges or articulating concerns with one strong voice for the attention and information of policy makers. They may also make more use of ICT tools such as the mobile phone to get more access to information from service providers such as extension agents and input suppliers.

Conceptually, the policy environment may have implications for the nature of linkages, networking and interactions among actors, which in turn, may influence their capacity to respond to challenges. Since actors in the value chain do not typically possess all the requisite capabilities and resources, they integrate into networks or partnerships and interactions with one another in order to contribute resources and expertise towards addressing inadequacies (Rycroft and Kash, 1999; Christensen and Raymor, 2003). Thus, a successful innovation process is determined by the extent to which actors in the value chain establish linkages to form networks, and how these networks gather sufficient variations in capabilities and resources from diverse agents. The effectiveness of the network is dependent on the collective capacity to facilitate exchange of information and resources. In the technology of network analysis, Buchman (2002**),** describes this capacity as the networks 'navigability' and notes that this capacity depends on the existence of central actors (i.e. well-connected actors) interacting among themselves and on the environment (i.e. laws or markets) on which the networks operate. Network effectiveness also depends on the ability of networks to search for and use existing information, and when it is not available, ability to generate it. This is in turn, influenced by the network's ability to develop their organizational capabilities or the individuals, technologies, shared norms and organizational routines needed to communicate information and coordinate resources (Dosi et al., 2000, Zander and Kogut, 1995, Bailey and Ford, 2003).

2. Materials and methods

2.1. Description of study areas

The study was generally conducted nation-wide; however, the Eastern Region was purposively selected as the specific location for the study. The Eastern Region is noted to be an important cocoa and pineapple production area in Ghana. It is acknowledged that the Eastern Region has the best soils and other environmental requirements for cocoa. (Appiah et al., 1997; Ahenkorah et al., 1987). Out of the five cocoa growing regions in the country (Western, Ashanti, Eastern, Brong Ahafo and Volta), the Eastern Region, based on figures from the Ghana Cocoa Board as of the 2009/2010 cocoa season, occupied the fourth

position in terms of production figures, after Western, Ashanti, and Brong Ahafo. Historically, cocoa cultivation in the country started from the Eastern Region where Tetteh Quarshie, a native of Osu, Accra after returning from Fernado Po with Amelonado cocoa pods in 1879, established a cocoa farm at Akuapem Mampong.

In terms of pineapple, there are three main pineapple growing geographical regions producing especially for the export market; namely, Eastern, Central and Volta regions, with marginal production from the Ashanti, Western and Greater-Accra regions. Of the three main regions, Eastern Region is one of the leading pineapple growing areas in Ghana.

Two districts of the Eastern Region were purposely selected as the specific information-rich locations for the study. With regard to pineapple, the Akuapem South District was selected, while the Tafo Cocoa District was the focus for cocoa.

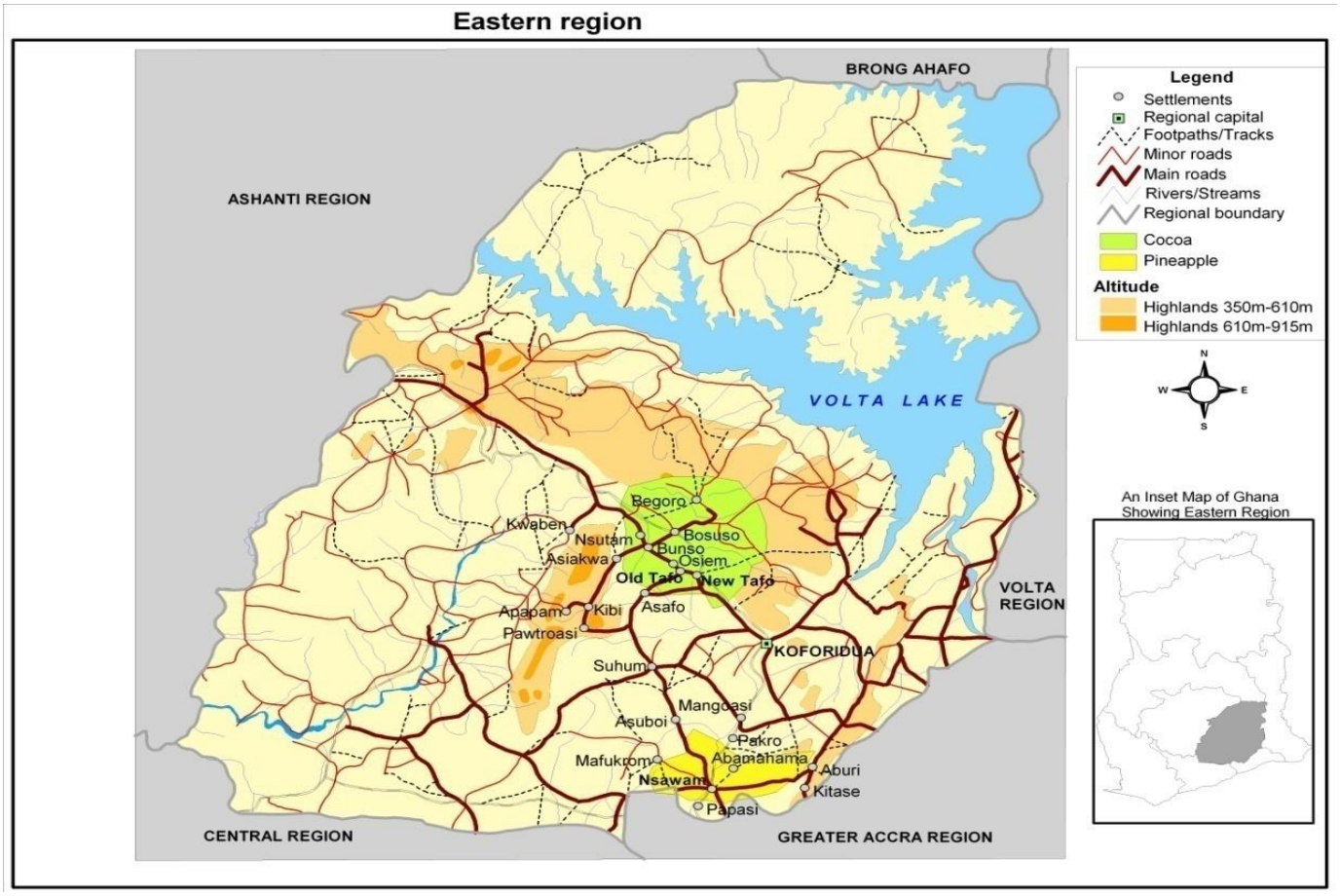

Figure 2. Map of Ghana showing the Eastern Region with the two districts (Source: Institute for Scientific and Technological Information, Accra, 2011)

2.2. Data gathering methods

The research design was generally qualitatively inclined, using the multiple case study design approach with the cocoa and pineapple value chains being selected as the case studies. Using a combination of quantitative

and qualitative data gathering methods for the purpose of triangulation and thus increasing internal validity, the study thus employed both probability (stratified random sampling) and non-probability (purposive sampling) sampling methods.

The multiple data gathering methods included:

- Eight Focus Group Discussion sessions (four sessions with small-scale pineapple and four sessions with small-scale cocoa farmers) at the two respective study locations-Tafo Cocoa District and Akuapem South District.
- One-on-one in-depth interview sessions with three categories of value chain stakeholders, namely **Value Chain Actors** (chain of actors who deal directly with the product i.e. input suppliers, farmers, buyers and processors); **Value Chain Supporters** (group of actors who offer support to the value chain) i.e. research institutes working on cocoa and pineapple, extension agencies, certification agencies); **Value Chain Influencers** (the regulatory framework, policies, infrastructure etc)
- Survey of 310 small-scale pineapple and 325 cocoa farmers in the two respective study areas using structured questionnaires
- Document investigation
- Visits (to some of the cocoa and pineapple farms, and processing firms)

2.3. Data analysis

Qualitative data (from the focus group and in-depth interview sessions) were analyzed through the development of case description. A descriptive framework for organizing the two case studies was developed for the case study write-ups. Two types of analysis: Within Case Analysis and Cross Case Analysis. For the quantitative data (survey of small-scale pineapple and cocoa farmers using structured questionnaire), the windows version of the Statistical Package for the Social Sciences (SPSS) 17.0 was used for the analysis. Analysis was univeriate and done by way of descriptive statistics i.e. frequencies and percentages.

3. Results and discussions

The results are presented in three parts. The first part discusses key factors that trigger evidence of innovativeness among actors in the cocoa and pineapple value chains. The second part discusses the cross case comparison of the two value chains and particularly highlights how the nature of leadership in value chain functions and service provisions enhances the capacity of actors in agricultural value chains to show evidence of innovativeness. The third part concludes the paper and highlights policy implications of the findings.

3.1. Triggers of innovativeness

Innovativeness may generally not be exhibited in a vacuum, and may usually be in response to a challenge, demand, competition, crisis, needs and market opportunities (Daane et al., 2009). Hall and Clark (2009)

recounted how Ugandan farmers responded to the outbreak of the ACMV Disease of cassava through various means of innovativeness; the thrust of which involved certain adaptations to their cropping, social and biological systems. The farmers coped with the major crisis to their livelihoods by mobilizing whatever ideas and resources they had at their disposal to adapt the way they produced their crops to earn a living. The two case studies provide evidence to suggest that actors in the cocoa and pineapple value chains show evidence of innovativeness in response to competition, demands of the export market, market challenges, crisis situations, and production challenges consistent with some of the conditions identified by Daane et al. (2009).

3.1.1. Competition

The introduction of private sector participation in the local marketing of cocoa beans in 1992 appeared to have broken the monopoly of the state-owned Produce Buying Company, and introduced intense competition in the enterprise (Anthonio and Aikins, 2009). In line with theories of public choice, the involvement of private sector actors in an enterprise generally engenders multiplicity of choices and lends itself to competition (Ayres, 1995).

The case study showed that the involvement of the private sector in the local purchases of cocoa beans had given cocoa farmers many choices, and offered them greater freedom to decide which Licensed Cocoa Buying Companies (LBCs) to offer their cocoa beans for sale. Based on figures from the Ghana Cocoa Board, as of 2011, there were as many as 23 LBCs (22 privately owned and one publicly owned) competing to buy cocoa beans locally (Manu, personal communication, 2011).

The cocoa value chain case study showed that some LBCs had responded to this competition by introducing innovative buying arrangements some of which included the offer of gifts on every bag of cocoa delivered, special awards, free technical advice or extension service and offer of credit to loyal cocoa farmers. All these arrangements were designed to serve as motivation to get individual cocoa farmers to sell to particular LBCs and by extension, strengthen the capacity of LBCs to survive the competition.

Competition in any enterprise may generate more resourcefulness and may enhance efficiency. However, the case study showed that competition, engendered by the privatization of local marketing of cocoa in Ghana, had in its wake compromised the quality of cocoa beans delivered by farmers for sale to LBCs. In view of the competition, LBCs were ready to buy any quality of cocoa beans offered by farmers for sale and later recondition them to the required standard. This was because once a particular LBC rejected cocoa beans offered for sale on grounds of poor quality; the next LBC would be waiting to accept these poor quality beans. What this meant was that LBCs knew the quality standards, however, for fear of losing farmers, some LBCs allowed quality standards to go unchecked. Farmers were, for instance, expected to dry their cocoa beans to 7-8%. However, some of them dried their cocoa beans to 10-11% and offered them for sale to some LBCs, who rather than rejecting the poorly dried cocoa beans, accepted them and continued with the drying to the required level of 7-8%. The responsibility of cocoa farmers in assuring the quality of their cocoa beans was thus passed on to LBCs (Addo, personal communication, 2011).

3.1.2. Demands of the export market

Cocoa and pineapple, being export commodities, thrive on farmers' ability to meet the demands of the market. Farmers therefore strive to produce to satisfy the demands of the market. The sudden change in preference from the traditional smooth cayenne variety to the MD2 variety altered the demands of the export market for pineapple. In their effort to respond to the demands of the export market with regard to MD2 pineapple, farmers in the study area had to invest in knowledge and skills' acquisition through training and field demonstration offered by stakeholder institutions. The survey of small-scale pineapple farmers in the Akuapem South District showed that within the last five years, as many as 93% and 80% of farmers claimed to have ever taken part in training and field demonstration respectively, important platforms for building their knowledge and skill base. This showed the aggressiveness on the part of pineapple farmers to broaden their knowledge base as far as the pineapple business was concerned.

KORANCO farm, one of the commercial pineapple farms in the study area had hired the services of experts from Costa Rica to transfer the technology of MD2 production (Koranteng, Personal Communication, 2011). This initiative represented a case of investment in technology transfer, which had made KORANCO farm one of the leading farms in Ghana as far as the production of MD2 for the export market was concern. There is the trickle-down effect of such investment as out grower farmers of KORANCO farm also benefit from such technology transfer.

Similarly, the demand for organic cocoa and pineapple by some importing countries generally had largely influenced the direction of husbandry practices among some growers of the commodities. Such practices that had involved increasing use of organic manure and limited or none use of agrochemicals had featured prominently in the husbandry practices of farmers.

For cocoa, the introduction of certification had required some adaptations in services provided by the Ghana Cocoa Board system, both in terms of ensuring traceability to certified individual producers, and in terms of the necessity to pay a differential price for organically certified cocoa beans.(Kolavalli and Vigneri, 2010). Pineapple producers and exporters, on the other hand, have had to respond to Global Good Agricultural Practices (GLOBALGAP) certification; having to go through internal and external audits to qualify for certification. These are stringent international standards, which the smallholder producer, in particular, may not have the wherewithal to meet. It is instructive to note the important collaboration such state-owned organizations as the Ghana Standards Authority have with producers through the provision of support services in chemical residue analysis.

A key external factor that has influenced the export market in recent times has been the global trends in social accountability and human rights, and one of the emerging social issues for the cocoa industry, in particular, is that of rights of the child (Essegbey, 2008). For cocoa as an export commodity, the issue of child labour on cocoa farms has become so vital that the Ghana Cocoa Board has established child labour desks at the Head Office and in all Regional Offices to monitor child labour in the cocoa sector, advise management on issues relating to the worst forms of child labour and collaborate with other stakeholders in an effort to mitigate the practice (COCOBOD, 2007). This intervention of the Ghana Cocoa Board appears to be in reaction to recent concerns about the use of children on cocoa farms, particularly in the West African sub-region and the possible ramifications for countries indulging in Worst Forms of Child Labour (WFCL) and Forced Adult

Labour (MMYE, 2007). WFCL is one of the conditions for fair-trade certification, which enables selected cocoa farmer groups to obtain premium prices for their cocoa.

3.1.3. Crisis situation

The switch in export variety presented a crisis situation that threw some pineapple farmers, especially smallholder farmers, out of business. From the onset of the introduction of MD2, some farmers lacked knowledge about the technology of its cultivation. Additionally, some small-scale farmers did not have the wherewithal to invest in the MD2 technology, which was more capital intensive compared with the traditional smooth cayenne variety (Jacob and Soman, 2006; Danso et al., 2008; Whitfield, L., 2010). Pineapple farmers, especially smallholder ones, had to devise means of responding to the crisis situation brought about as a result of the shift in preference from smooth cayenne to MD2.

Some pineapple farmers responded to the crisis situation by exploring market opportunities in the local processing industry and local market for fresh pineapples. The smooth cayenne variety is said to be a good raw material for pineapple processing; processors such as Blue Skies, therefore encourage farmers to grow more smooth cayenne variety, although some processors use MD2 as their raw material (Azaglo, personal communication, 2010). Small-scale pineapple farmers therefore, directed their efforts towards local pineapple processing firms such as Blue Skies, taking advantage of the market opportunity offered by the processing industry.

This explained why Blue Skies commanded the biggest share of the small-scale fresh pineapple market in the Akuapem South District with as many as 70% of small-scale farmers selling to the processing firm. From the survey, just 2% of small-scale pineapple farmers in the area sold to the export market; a situation attributed to their inability to survive the stringent requirements and demands of the export market, especially with respect to MD2. The new and ever changing regulations, according to Kibwika *et al.* (2009), are making export of vegetables from Uganda, especially to the European markets more difficult. They explain that this situation has made many Ugandan vegetable exporters explore the local market, but with a new quality attractive to the elite community in and around urban areas. Firms innovatively package an assortment of vegetables in one basket to make it easy for supermarket shoppers.

The case study also showed that other small-scale pineapple farmers in the area had responded to the crisis situation by channeling their produce to the local market for fresh pineapples selling to market women. The survey showed that 13% of pineapple farmers in the study area sold to the local market through market women.

3.1.4. Marketing challenges

For highly perishable commodities such as pineapple, marketing presents a peculiar challenge to producers. Producers therefore have to devise innovative means to respond to the challenge of finding timely and competitive market for their produce to survive in the industry. For small-scale pineapple farmers, this is quite instructive as they may not have the resources to invest in marketing infrastructure such as cooling facilities, compared with their counterparts who produced on commercial scale. In the case of the horticultural industry, and pineapple in particular, the need for good marketing infrastructure is particularly

acute with a perishable product having high demand for post-harvest handling (NRI, 2009). MD2 pineapple variety, for instance, is a temperature sensitive product that must be cooled within 1-3 hours of harvest. This is a very difficult condition when trying to collect produce from large numbers of small farms, scattered over a wide area and accessed by poor quality roads (NRI, 2009). According to Fold and Gough (2008), every hour of delay in cooling can reduce shelf-life by one day in the EU.

One of the ways small-scale pineapple farmers have responded to marketing challenges is to forge linkages and sell as a group in order to increase their bargaining power and guarantee the needed quality. The important role of pineapple farmer-based organizations (FBOs) in the marketing of fresh pineapples is quite instructive. These pineapple FBOs have introduced demand-driven principles to market their fresh pineapples by first looking for potential buyers, and entering into a memorandum of understanding with such buyers before planting. This way, they can be sure that a greater percentage of suckers they put in the soil would produce fruit which will be sold. The pineapple FBO plays an important role in this marketing innovation. The Fotobi Cooperative Pineapple Growers and Marketers Society, for instance, has a Marketing Committee which negotiates for better terms for its members. Besides, the Committee has the responsibility for exploring possible markets and facilitating the signing of Memoranda of Understanding between potential buyers and farmers who are members of the association. The Committee further monitors farmers and ensures that they meet the requirements of the market. Kibwika *et al.* (2009) also recounted how farmer organizations in Uganda had reduced over-exploitation by traders through the setting up of minimum prices for banana and coordinating the marketing of the commodity at the farm level.

The cost of quality certification is beyond the reach of most small-scale pineapple farmers. A pineapple farmer has to pay the equivalent of about 1700 US$ to be able to go through certification from the Kenyan-based Africert, an accredited agent of GLOBALGAP (Mensah, personal communication, 2010). Besides, as the requirements for certification, the farmer needs to go through series of training and open up his farm for inspection. The farm must be equipped with basic logistics such as first aid box, protective equipment etc. Pineapple farmers who produce on medium to large-scale basis usually may have the resources to be able to afford the cost. Small-scale pineapple farmers, who are mostly less endowed, have therefore used horizontal linkages as a means to address the high cost of certification. Pineapple FBOs pool resources together and occasionally seek support from donor agencies such as GTZ to be able to receive certification. The Ministry of Food and Agriculture (MoFA) also supports by running trainings for such farmers preparing for certification. For the small-scale pineapple farmer, certification has become a necessity in view of the requirement of GLOBALGAP certification from oversea buyers and commercial processing companies. The Fotobi Cooperative and Pineapple Growers and Marketers Society, for instance, is a GLOBALGAP certified out grower to Blue Skies, a pineapple processing company, thanks to the training received by members of the association from USAID-sponsored Trade and Investment Programme for a Competitive Export Economy (TIPCEE) through the MoFA.

3.1.5. Production challenges

Evidence from the case studies showed how actors in the two value chains had surmounted various production challenges in the industries by collectively employing new ideas, some of which were derived from experiences gained on the job, interactive learning through training and field demonstrations and new knowledge from research and development activities. Some large-scale pineapple farmers had developed the capacity to undertake their own research to generate knowledge which could be applied to address particular production challenges. Such innovative activities included experimental trials on fertilizer or pesticide dosage carried out on experimental plots located on-farm.

Cocoa farmers, on the other hand, had realized the obvious benefits of having a united front; a situation which had led to a growing trend towards farmer group formation in the study area. Most of the production challenges mentioned by farmers had been contained somehow through the forging of linkages. First, through cocoa FBOs, farmers had improved their accessibility to modern farming technologies. It is much easier to create a platform for knowledge sharing and transfer when farmers are organized in groups, rather than individual farmers loosely knitted. This explained why the activities of the Cocoa Research Institute of Ghana (CRIG) were observed to be better felt in communities where farmers were more organized. The CRIG produces a farmers' newspaper, which disseminates information on cocoa to cocoa farmers and other stakeholders. Not all members of FBOs are literate; hence at meetings of FBOs, executives read and pass on the information in local dialect to members who cannot read. Some of the information in the newspaper is discussed at such meeting, offering a good platform for information sharing and knowledge acquisition.

Second, input supplying shops were noted to be sparsely distributed in cocoa growing communities, and were farther apart from farming communities. Consequently, door-to-door services were usually not common. Farmer groups therefore organized themselves to solicit the services of input suppliers who used the platform also for education on the correct application of inputs. Through this innovative arrangement, input supplying services had become more accessible to farmers who hitherto had to travel long distances to access such services.

4. Cross case comparison and discussions

The policy environment in terms of research and development support, extension service delivery, credit, and provision of physical infrastructure may either engender public sector leadership or private sector leadership in the activities of value chains. As shown in table 1, while value chain functions and support services in the case of the pineapple value chain were observed to be principally led by private sector actors such as input suppliers, pineapple processors and commercial pineapple farmers, that of the cocoa value chain were characterized largely by the activities of public sector actors such as the main government regulatory agency, the Ghana Cocoa Board with its subsidiary divisions (the Cocoa Research Institute, Cocoa Swollen Shoot Virus Disease Control Unit, Quality Control Division, Seed Production Unit and the Cocoa Marketing Company).

Table 1. Nature of Leadership in the various Value Chain Functions and Support Services for Cocoa and Pineapple

CASE STUDY	VALUE CHAIN FUNCTION	NATURE OF LEADERSHIP	SUPPORT SERVICE	NATURE OF LEADERSHIP
Cocoa	Production	Private	R & D	Public (CRIG)
	Input supplying	Private-public	Extension	Public-private
	Processing	Private	Pest/Disease Control	Public-private
	Marketing	Public-private	Finance	Private
Pineapple	Production	Private	R & D	Private-public
	Input supplying	Private	Extension	Private-public
	Processing	Private	Pest/Disease Control	Private
	Marketing	Private	Finance	Private

Source: Field Work, 2011

Note: Public-Private = Public outweighs private; Private-public = private outweighs public

Generally, value chain linkages create more space for complex systems of interactions, networking and learning behaviours for actors to build their capacity to respond to situations in the industry. Actors in the pineapple and cocoa value chains do not possess all the requisite capabilities and resources and therefore integrate into network to address possible inadequacies. Such network creates the platform for convergence of resources towards addressing situations in the industry consistent with the innovation systems thinking (Spielman et al., 2009; Hall et al., 2006; Van Huis et al., 2005).

The two case studies showed that private sector leadership in value chain functions and service provision generally created more space for value chain linkages and interactions as evidenced by the preponderance of activities of pineapple FBOs and other value chain actors. The survey of small-scale farmers showed that while 96% of pineapple farmers claimed to belong to one FBO or the other, 42% of cocoa farmers claimed membership of cocoa FBO. Similarly, whereas farmer-processor linkages in the pineapple value chain, according to the survey stood at 90%, that for the cocoa value chain was 41% as shown in table 2.

Actors in the pineapple and cocoa value chain who were better resourced in terms of capitalization, expertise, and experience tended to have better capacity to address situations in the industry. For instance, commercial pineapple farmers were noted to be better resourced to respond to the challenges of quality assurance through their investments to secure GLOBALGAP certification. This was not the case with small-scale pineapple farmers, most of whom did not have the resources to secure quality certification and virtually had to abandon the export market to channel their produce to the local market and local processing industries. Some of the small-scale pineapple farmers however had to enhance their capacity to address the

challenges associated with GLOBALGAP certification by strengthening linkages among themselves via pineapple FBOs and with some stakeholder institutions. These linkages allowed the farmers to pool resources, financial, human, material or otherwise to surmount the challenge of raising resources to go through GLOBALGAP certification.

Table 2. Farmers' perceptions of linkages within the cocoa and pineapple value chains

Nature of Linkage	COCOA		PINEAPPLE	
	Frequency	%	Frequency	%
Farmer-to-Farmer	144	42	296	96
Farmer-to-Input Supplier	147	43	257	83
Farmers-to-Buyer	144	42	276	89
Farmers-to-Processor	141	41	280	90

Fieldwork, 2011

The effectiveness of such linkages or networks according to Bailey and Ford (2003), depends on the ability to develop organizational capabilities and to communicate information and other resources. Rycroft and Kash (1999) also suggested that the performance of networks depended on the core capabilities of actors, their internalized complementary assets and organizational learning routines, factors which are largely influenced by the policy environment. Additionally, Klerkx et al. (2010) study, which was confirmed by De Lauwere et al. (2006) and Meijeret et al. (2007), suggested that internal project factors such as economic developments and policy discontinuities can induce interaction cycles.

5. Conclusions and policy implications

The study shows that private sector leadership in value chain functions and service provision can promote choices and create more space for complex systems of interactions and learning behaviours first, for actors to build their capacity to respond to situations in the industry, and second, for them to show more evidence of innovativeness The capacity of actors in the value chains to exhibit innovativeness is a function of their resourcefulness (capital, expertise, and experience), and value chain linkages (horizontal as in FBOs or vertical as in linkages with support service providers and other value chain actors). The implications for policy are that a gradual reduction in public sector participation in value chain functions and support services and a steady expansion of the space for the participation of private sector actors such as processors, input suppliers and commercial producers, may hold the key to building the capacity of actors to trigger innovativeness in the industry to become more competitive.

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