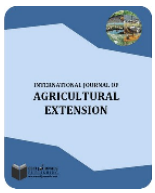

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IMPLICATIONS OF POLICY ON PUBLICLY AND PRIVATELY DRIVEN AGRICULTURAL INDUSTRIES: CASE STUDY OF COCOA AND PINEAPPLE VALUE CHAINS IN GHANA

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A B S T R A C T

This study sought to assess the implications of policy on the cocoa and pineapple value chains in Ghana. Using the multiple case study design approach, the study was derived from analyses of documents and interviews with different actors in the two case studies with emphasis on the value chain as a whole. The intention was to obtain the perceptions, knowledge and behaviors and their bases of the actors as perceived and interpreted in their own context. Results showed that policy environment that promoted public sector leadership in value chain functions and service provision, offered fewer incentives for smallholder producers in the value chain to translate their challenges into innovative behaviors. The study further showed stronger desire on the part of actors in the pineapple value chain to forge linkages and interact more strongly. This had translated into making service provision to the value chain more demand-driven and pluralistic. The study makes a case for greater space for private sector involvement in value chain functions and service provision, which is more likely to offer the platform for more interactive learning towards systems innovation

Keywords: Policy, cocoa, pineapple, value chain, publicly driven industries and privately driven industries.

INTRODUCTION

In Ghana, the agricultural export sector is driven by two main types of export: traditional and non-traditional. While the traditional agricultural export sector is led by cocoa, pineapple represents one of the leading commodities in the non-traditional export sector. These commodities have been strategic given their potential to contribute towards national export drive, foreign exchange earnings and poverty alleviation, especially for smallholder producers. For instance, much of the growth in foreign exchange earnings derived from agriculture, which was estimated at US$ 1,187.4 million (31.9%) in 2006, US$ 1,103 million (26%) in 2007, US$ 1,502 million (28.5%) in 2008, US$ 1,866 million (31%) in 2009, and US$ 2,285.2 million (27%) in 2010, was driven largely by contributions from the cocoa, timber and non-traditional export, including pineapple (ISSER, 2010). Based on figures from the Ghana Statistical Service, cocoa contribution to Ghana's economy in terms of Gross Domestic Product (GDP) has been increasing steadily from 2009 to 2013, and its contribution has been comparable to the entire crop sector as reflected in Table 1. In terms of employment, the cocoa industry employs about 60% of the national labour force (Appiah, 2004); a situation which makes opportunities offered by the commodity one of the keys to government's drive at job creation in the rural areas. Ghana's pineapple export sub-sector, though fairly young in comparison with cocoa, grew from virtual non-existence between 1990 and 2004 to 68,000 metric tonnes, becoming the country's first horticultural export product (Danielou & Ravry, 2005). Besides, Ghana's pineapple industry is estimated to generate rural income of GHC 6 million to 25000 households in rural communities (Fold & Gough, 2008).

Pineapple's contribution to the non-traditional export sector has been quite significant.

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Table 1. Gross Domestic Product at Correct Price for Agriculture (2009-2013) (Million Ghana Cedis).

	2009	2010	2011	2012	2013
Crops	8,425	9,422	10,650	11,477	12,216
Cocoa	874	1,392	1,996	2,044	2,190
Forestry & Logging	1,314	1,614	1,549	1,705	1,918
Fishing	874	1,001	952	1,057	1,211

Source: Ghana Statistical Service, Accra, 2014.

Figures from the Ghana Export Promotion Council as represented in table 2, indicates that in 2006, the value of pineapple exports amounted to over US$ 19 million, 38% of the total value of horticultural exports. Additionally, between 2000 and 2004, export of pineapple grew from US$ 11,853,128 in 2000 to US$ 22,068,645 in 2004, reflecting positively on the overall amount of revenue generated from the agricultural non-traditional export sector. Rather than exporting these commodities in their raw form, the focus in recent times has been on making the agricultural export sector more economically viable and sustainable through value-added exports; adding value to the commodity at each level of the value chain.

Table 2. Contribution of Pineapple to Non-traditional Export from 2000 to 2012.

Year	Weight (KGS)	Value (US$)
2000	28,511,600	11,853,128
2001	35,173,900	13,316,450
2002	46,391,300	15,519,990
2003	45,145,400	14,378,038
2004	71,805,617	22,068,645
2005	46,694,534	12,784,322
2006	60,751,084	19,086,134
2007	40,456,246	13,474,551
2008	35,134,351	11,842,250
2009	31,566,665	10,628,229
2010	40,141,400	13,554,621
2011	45,057,147	16,972,432
2012	41,211,912	16,815,539

Source: Ghana Export Promotion Authority, Accra, 2014.

The policy environment may be critical to the competitiveness of actors of agricultural commodity value chain as it is likely to have implications for the habits, behaviours and practices of actors in the chain. The public policy environment generally leads to interventions, which may take the form of the provision of key infrastructure, described by Kibwika *et al.* (2009) as any intervention of public nature or facilities that support the agribusiness sector (including the cocoa and pineapple industries), but would be too expensive for a private company to invest in. Investment in the research systems, for instance, may increase the supply of new knowledge and new agricultural technologies; however they may not necessarily improve the capacity for innovation throughout the agricultural sector (Rajalahti *et al*., 2005). In recent times, however, more attention has been given to the demand for research and technology and the development of wider competencies, linkages, enabling attitudes, practices, governance structures and policies that allow this knowledge to be put into productive use (Hall *et al*., 2006). In the quest for more competitiveness and sustainability in the value-added activities of agricultural commodity industries, the innovation systems concept appears to offer opportunities for understanding how a country's agricultural sector can make better use of new knowledge with the potential to design alternative interventions that go beyond research investments. Christensen and Raymor (2003) define an innovation system as the set of agents involved in an innovation process, their actions and interactions and the socio-economic institutions that condition their practices and behaviours. This framework, according to Spielman *et al*. (2009), embeds technological change with a larger, more complex system of interactions among diverse actors, organisational cultures and practices, learning behaviours and cycles and rules and norms. The innovation systems concept has however been applied to agriculture in developing countries only recently (Hall *et al*., 2001,; Hall, 2005; Hall *et al*., 2006).

The policy environment may promote public or private sector leadership in the activities of agricultural commodity value chains. The public-private sector discussion is based on two main theories; theories of public choice and theories of property rights (Ayres, 1995). The literature largely points to fact that private sector involvement generally engenders greater technical and economic efficiency and improvement (Furubton & Rejovich, 1972; Alabi & Mafimisebi, 2004; Hall & Lobina, 2005). Conceptually, this paper posits that

there is an assumed differential in innovativeness between publicly driven and privately driven industries, and this may be linked largely to the general policy environment within which actors operate. The paper therefore attempts to examine how the policy environment promotes public sector leadership or private sector leadership in value chain functions and service provision, and how the type of leadership builds the capacity of actors within a given commodity value chain to respond to key challenges in the industry, conceptualised as innovativeness.

Conceptual Framework: The paper essentially integrates the agricultural innovation systems perspective and the value chain concept to study the innovativeness of two agricultural commodity value chains. The agricultural value chain symbolizes the industry aspect in the agricultural innovation system, and the two concepts often have a lot in common, although they may respond to different organizational principles. They are highly complementary and overlapping (World Bank, 2007). Value chain focuses on value creation, adding value at each level of the chain; an activity that can be realized through innovation; technological, social, organizational or institutional, all these aspects having a bearing on the value chain stages or the value chain as a whole.

The conceptual framework for this paper makes the assumption that actors in agricultural commodity value chains face challenges and constraints in the course of executing value chain functions, requiring that actors develop the capacity to respond to these challenges and constraints. This capacity of actors is conceptualized as innovativeness. The assumption is that the existing policy environment may influence the value chain functions, the nature of linkages among value chain actors and the provision of support services to the value chain and consequently, the innovativeness of agricultural value chains either privately or publicly driven. This is graphically presented in figure 1. The assumption is that the influence of the policy environment on publicly-driven and privately-driven agricultural commodity value chains is likely to be different, and this is likely to reflect differently on the ways actors of the cocoa and pineapple value chains exhibit innovativeness. 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 stimulate innovations by providing the right 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 a*l. (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). It is also important to 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 (Hall *et al*., 2006).

A case study from Ghana as cited by Rajalahti *et a*l. (2008), describes how pineapple exports developed in response to improved market opportunities. Policies that favoured market liberalisation and improved availability of finance enabled entrepreneurs to invest in pineapple export. The enabling environment is considered an important promoter of innovation capacity as 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).

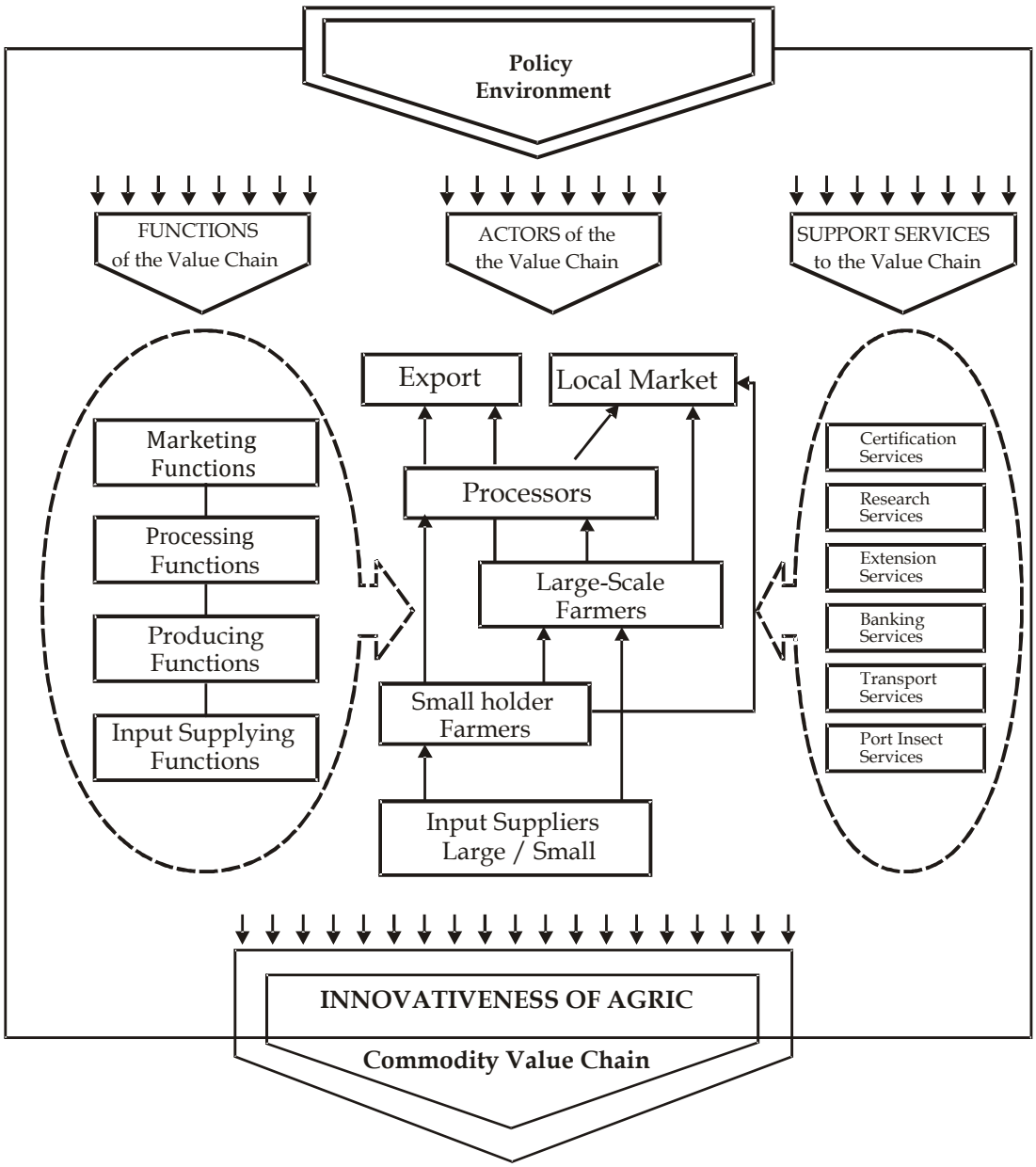

Fig 1: Conceptual framework showing the possible influence of the policy environment on value chain functions, value chain actors and support services to the chain, and the innovativeness of agricultural commodity value chain
Source: Fieldwork 2011.

Policies have to be coordinated; 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 as shown in figure 2. Actors may be more or less dependent, 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/ideas together to address common challenges or articulating concerns with one strong common 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.

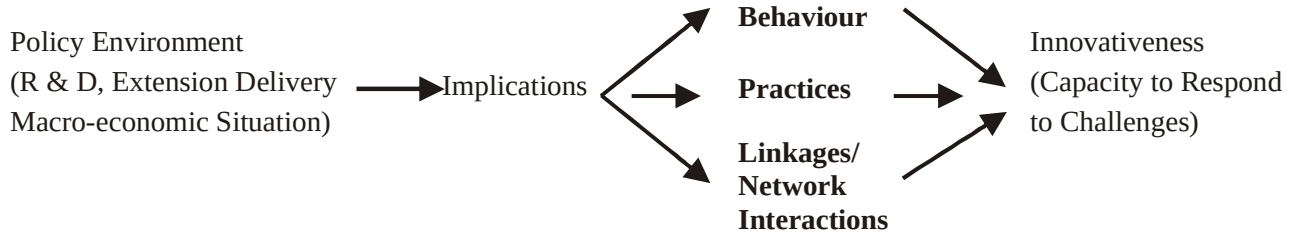

Fig 2: Model representing relationship between the policy environment (with its possible influence on behaviours, practices and linkages/network/interactions among actors) and innovativeness of value chain actors.
Source: Fieldwork 2011

The conceptual framework also hypothesizes that the policy environment has implications for the nature of linkages, networking and interactions among actors, which in turn, influences 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 & Kash, 1999; Christensen & 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 & Kogut, 1995, Bailey & Ford, 2003).

MATERIALS AND METHODS

Case Selection: When selecting a case for case study, researchers, according to Flyvberg (2006), often use information-oriented sampling as opposed to random sampling approach used for quantitative studies. This is because an average case is often not the richest in information. Extreme or typical cases reveal more information in view of the fact that they activate more basic mechanism and more actors in the situation studied. Flyvberg (2006) adds that from both an understanding-oriented and an action-oriented perspective, it is often important to clarify the deeper causes behind a given problem and its consequences than to describe the symptoms of the problem and how frequently they occur. Random samples emphasizing representativeness will seldom be able to produce this kind of insight; it is more appropriate to select a few cases chosen for their validity. The study employs the multiple-case design with the cocoa (largely public sector driven) and pineapple (largely private sector driven) value chains as the case studies. The selection of these commodities was premised on their contribution to government's export drive and poverty alleviation

initiatives. Since 2001, cocoa had contributed a significant part of the agricultural productivity gains, and Ghana has enjoyed strong growth in the horticulture industry, partly led by pineapple. Both cocoa and horticulture are smallholder-based, and the poverty reduction associated with recent growth appears particularly strong among the cash crop growers (ISSER, 2009).

Description of Study Areas: The study was generally conducted nation-wide; however, the Eastern Region of Ghana was purposively selected as the information-rich location for study. The Eastern Region is an important cocoa and pineapple production area of Ghana. It is acknowledged by cocoa scientists (Appiah *et al.*, 1997; Ahenkorah *et al*., 1987) that the Eastern Region has the best soils and other environmental requirements for cocoa. 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.

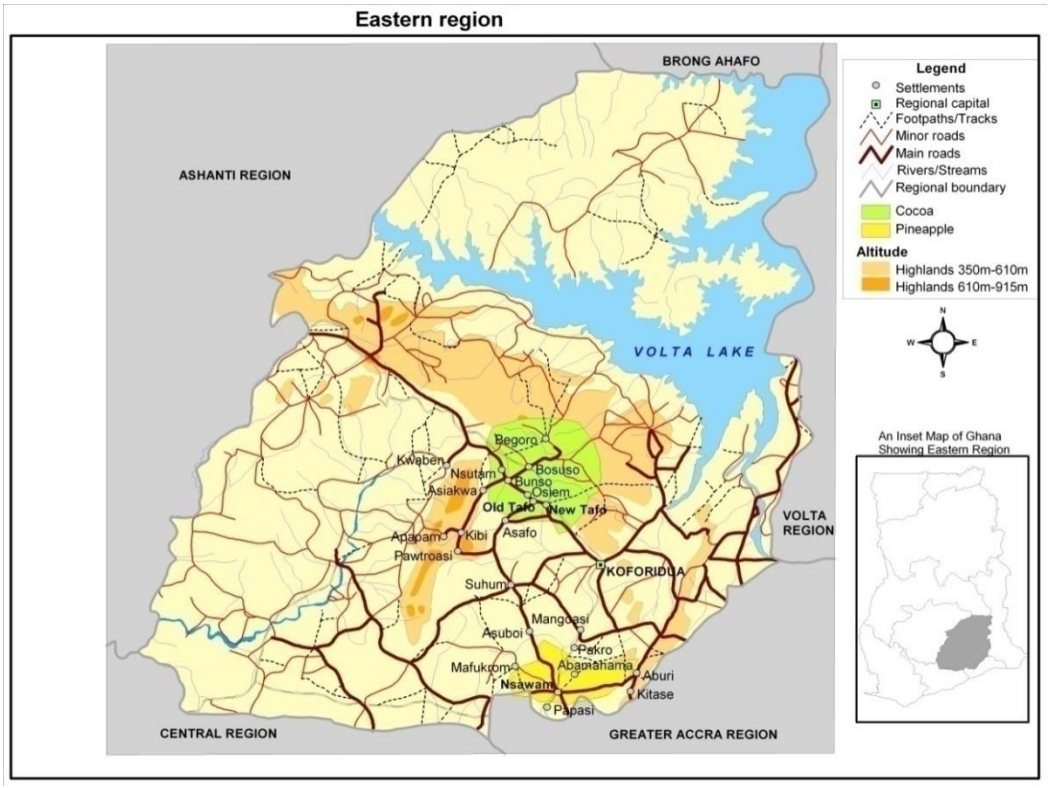

Figure 3: Map of Ghana showing the Eastern Region with the two districts.
Source: Institute for Scientific and Technological Information, Accra, 2010.

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 of Ghana 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 the leading pineapple growing area.

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.

Sampling and 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, the study thus employed both probability (stratified random sampling) and non-probability

(purposive sampling) sampling methods.

The multiple data gathering methods included:

1. 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.
2. 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** (the services provided by various actors who never directly deal with the product, but whose services add value to the product i.e. cocoa and pineapple research institutions, extension institutions, certification institutions); **Value Chain Influencers** (the regulatory framework, policies, infrastructure etc)
3. Survey of small-scale pineapple and cocoa farmers in the two respective study areas using structured questionnaire
4. Document investigation
5. Visits (to some of the cocoa and pineapple farms, and processing firms).

Table 3. The Data Gathering Methods.

NO.	Types of Data Gathering	CASE	
		Cocoa Value Chan	**Pineapple Value Chain**
1	Focus Groups	4 Sessions with smallholder farmers	4 Sessions with smallholder farmers
2	In-depth Interviews	2 Licensed Buying Companies 2 Purchasing Clerks of LBCs 1 Commercial Processor 1 Cocoa R & D Institution 1 Policy/Regulatory Institution 2 Community Extension Agents 2Farmer-based Organisations 1 Rural Bank in the study area 1 Extension Training Institution 2 Regulatory/Certificate Institutions	2 Commercial Farmers 4 Agro-input Suppliers 2 Small-Scale Processors 2 Large-Scale Processors 2 Market Women 2 Umbrella Associations 2 Farmer-based Organisations 2 Agric Extension Agents 3 Public Sector Agencies 1 Local FM Radio Station 6 Public R & D Institutions 2 Banks (1 commercial, & 1 rural)
3	Questionnaire Survey	325 Small-scale Farmers	310 Small-scale Farmers
4	Document Analysis	Journals, Annual Reports, etc.	Journals, Annual Reports etc
5	Visit	2 Cocoa Farms	2 Small-Scale Farms 2 Commercial Farms 2 Small-scale Processors 2 Commercial Processors

Source: Field Work, 2011.

Data Analysis: Qualitative data (from the focus group and in-depth interview sessions) were analysed 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 analysis.

RESULTS AND DISCUSSIONS

The results are presented in three parts. The first part discusses the policy environment for cocoa and pineapple, their implications for the cocoa and pineapple value chains and the effects of policy on the functioning of the two value chains. The second part discusses the cross case comparison of the two value chains and

particularly highlights the key points of departure. The third part concludes the paper and highlights policy implication of the findings.

General Policy Environment: The public policy environment generally leads to interventions, which may take the form of the provision of key infrastructure, described by Kibwika *et al.* (2009) as any intervention of public nature or facilities that support the agribusiness sector, but would be too expensive for a private company to invest in. Such infrastructure (research, extension, and financial support and state of physical infrastructure such as road, water, and electricity), which provides the framework for innovative activities may either enhance or inhibit innovations in agribusiness (Kibwika *et al.,* 2009). Based on policy environment as discussed in literature (Tripps, 2003; Singh et al., 2005; IFPRI, 2010), this paper operationalises policy environment as set of policies, specifically regarding policy on research and development (R & D), extension/technology dissemination and public provision of particular interventions to support the industry.

Policy Environment for Cocoa: The policy environment for cocoa reflects a high level of public sector leadership in value chain functions and service provision. In terms of cocoa R & D, the policy orientation is largely public sector led, expressed in the activities of the Cocoa Research Institute of Ghana (CRIG), which is a major source of new knowledge to the value chain. CRIG, one of the divisions of the Ghana Cocoa Board (COCOBOD), is mandated to undertake research into all problems relating to the production, processing and utilisation of cocoa, and provide information and advice on all matters relating to the production of the crop (Appiah, 2004). Technologies developed by the CRIG are transferred to cocoa farmers through community extension agents.

Generally, agricultural extension delivery to the cocoa value chain is driven mainly by the public sector with the COCOBOD, through the Cocoa Swollen Shoot Virus Disease Control Unit (CSSVDCU), being mandated to deliver extension services to cocoa farmers. Cocoa extension had gone through some transformation. Ghana's Cocoa Sector Development Strategy has been characterised by the shifting of responsibility for cocoa extension delivery from the Cocoa Services Division, then a subsidiary of the COCOBOD, to the Ministry of Food and Agriculture (MoFA) (Dormon et al., 2004). With the recent transfer of the extension mandate from the MoFA to the CSSVDCU in 2010 under a public-private partnership, extension delivery to the cocoa value chain, especially to smallholder cocoa farmers, appears to be more focused and better resourced. Additionally, there appears to be a much stronger linkage between the main technology generation institution (CRIG) and the main extension delivery institution (CSSVDCU) as the two institutions fall under the same mother institution, the COCOBOD. Although cocoa extension delivery is largely public sector driven, there is evidence of private sector involvement in the delivery. Purchasing clerks (PCs) of Licensed Buying Companies (LBCs), most of which are private firms offer extension services to cocoa farmers. Some of the rural banks in the study area such as the Fanteatwah Rural Bank also engage the services of private extension agents to cocoa farmers upon advancing credit to them as a way of ensuring that farmers make the needed returns to service the credit (C. Amankwah, Fanteatwah Rural Bank, Osiem, Ghana personal communication, 2010).

The policy environment for cocoa is also characterized by the preponderance of public sector-led policy interventions, some of which have included the nationwide Cocoa Disease and Pest Control programme (CODAPEC) ,otherwise known as mass spraying exercise initiated during the 2001/2002 cocoa season; the Cocoa Rehabilitation Scheme, to assist farmers to rehabilitate and re-plant old, destroyed and abandoned farms (MMYE, 2006); and the Cocoa Hi-Tech programme, which Appiah (2004) defined as sustainable cocoa production by which the farmer increases and maintains productivity, through soil fertility maintenance at levels that are economically viable, ecologically sound and culturally acceptable using efficient management of resources.

In terms of marketing, there is a public sector regulated policy on internal marketing of cocoa, regulated by the COCOBOD through its subsidiary, the Cocoa Marketing Company Limited. The liberalisation of internal marketing of cocoa started in 1992 with the introduction of private LBCs as competitors to the state-owned monopoly in buying cocoa from farmers. The objective was to improve the operational and financial performance of Ghana's marketing system, to enable higher and competitive producer prices (Laven, 2007).

Implications for the Cocoa Value Chain: Christensen and Raymor (2003) note that socio-economic

institutions condition the practices and behaviours of actors. The implications of the policy environment may however, not be homogeneous, but may differ depending on the nature of leadership.

For cocoa, a well-defined policy on R & D, evidenced by the activities of the CRIG, is likely to reflect on the research outputs to the cocoa value chin with the likely development and release of more cocoa technological packages locally (*cocoa hybrid, hi-tech technologies*). The implication is that cocoa farmers, who are the point of entry to the value chain, are more likely to be dependent on the local research and extension systems.

This, in turn, is likely to make the research and extension system more linear, from CRIG (research) to CSSVDCU (extension) and finally to cocoa farmers. Cocoa farmers are more likely to serve as passive recipient of knowledge from research and thus likely to be less motivated to explore foreign sources as alternative sources of new knowledge outside the local research system. Consequently, cocoa farmers may be less likely to be aggressive in searching for options to address production challenges.

Similarly, a public sector regulated policy on the marketing of cocoa, with interventions such as guaranteed prices for the commodity and the payment of bonuses, implies cocoa farmers are less likely to be aggressive in exploring innovative marketing arrangements. This means farmers are likely to get more ready market for their produce and thus less likely to be conscious of quality issues.

Effects of Policy on Functioning of the Cocoa Value Chain: Based on the policy environment and issues emerging from the cocoa value chain case study, extension service delivery to the value chain was noted to be less pluralistic with less participation of private sector actors. Evidence of private sector participation in extension delivery was realized through the extension activities of LBCs through their PCs. The study of the cocoa value chain showed limited involvement of private sector actors such as input suppliers in extension delivery. Besides, there was little evidence of cocoa processors in the value chain offering extension services to farmers as producer-processor linkages in the chain were rather weak.

The introduction of the policy of private sector participation in the local purchases of cocoa beans, while generating intense competition and giving more choices to farmers, seemed to have, compromised on quality. Cocoa farmers appeared to be less conscious of quality issues as LBCs were ready to buy any quality of cocoa beans offered by farmers for sale and later recondition them to the required standard. Thus, rather than rejecting cocoa beans dried to 12 %,, some LBCs would accept the beans, and continue the drying process to the required moisture level of 7-8 %. The responsibility of farmers in ensuring good quality cocoa beans was thus passed on to LBCs.

Training and field demonstrations are important avenues for building capacities in agricultural enterprises. As cocoa farmers are likely to be less aggressive in exploring options towards addressing challenges, this is likely to reflect on their desire for knowledge acquisition in terms of the frequency with which they will take part in training or field demonstrations, important platforms for knowledge acquisition. The results of the survey of small-scale cocoa farmers in the study area showed that 30% and 14% of farmers claimed to have ever taken part in training and field demonstrations respectively.

The prevailing macroeconomic conditions have implications for the cost of credit and willingness on the part of actors to access credit from the banks. Actors perceive the rate to be high, and this means cocoa farmers, for instance, will be less willing to access credit to maintain and expand their businesses. The survey of small-scale cocoa farmers showed that 84% of cocoa farmers claimed they had never taken loan from the bank; the cost of credit, fewer banking facilities, fear of defaulting with perceived punitive ramifications, among other factors, being cited as the reason for the situation. The case study showed that LBCs were more reluctant to approach commercial banks for credit to service their cocoa buying enterprise, resulting in their reliance on Ghana Cocoa Board's syndicated loan facility from foreign sources (M. Addo, Produce Buying Company, Koforidua, Ghana, personal communication, 2010).

Policy Environment for Pineapple: The policy environment for pineapple principally reflects a relatively higher private sector leadership in value chain functions and service provision evidenced by the preponderance of private sector actors participating in key activities of the value chain.

Although some amount of pineapple R & D activities takes place at public universities and research institutions in Ghana, there is generally a private sector led R & D system championed by commercial pineapple

farms, private input suppliers, commercial pineapple processors and famer-based organisations. Commercial pineapple farmers such as KORANCO Farm located in the study area, carry out on-farm trials to determine the appropriate dosage of fertilizer (E. Koranteng, KORANCO Farm, Nsawam, Ghana, personal communication, 2010). Blue Skies, a pineapple processing firm also in the study area, undertakes similar trials with some of its outgrower farmers (M. Azaglo, Blue Skies Company, Nsawam, Ghana, personal communication, 2010). Anwuntem Farms, a medium-scale pineapple farm, is currently trying samples of the sugar loaf variety on-farm to determine the feasibility of going into large-scale production of the variety (S. Anane, Annwuntem Farms, Nsawam, Ghana personal communication, 2010). A retailer of agricultural inputs in the study area, Samotech Ventures, has developed the capacity to conduct its own trials to ascertain the viability of planting materials before being sold to farmers (P. Mensah, Samoteh Ventures, Nsawam, Ghana, personal communication, 2010). Public sector involvement in pineapple R & D remained relatively weak. A study of six public R & D institutions in Ghana showed general inadequacy of scientific workers in most of the institutions as represented in table 4.

Besides, there is largely a policy inclined towards a more generalised extension delivery system under the unified extension system provided by the public extension agency, the Ministry of Food and Agriculture. Pineapple therefore faces competition with other commodities for extension attention unlike cocoa extension by the CSSVDCU. Generally, there is relatively limited public sector-led policy interventions similar to the ones observed in the cocoa value chain (mass spraying, hi-tech, guarantee prices, payment of bonus to farmers etc). In terms of marketing, there is a liberalised, private sector leadership in the marketing of pineapples. Pineapple farmers have to confront the challenge of looking for their own market and making their own marketing arrangements. Besides, they are confronted with such quality issues as meeting the requirements of GLOBALGAP to penetrate the export market.

Table 4: Human Resource Profile for key Pineapple R & D Institutions in Ghana.

R & D Intuition	Total No. Scientists	Gender		Qualification			Age Distribution			
		M	F	PhD	MSc	BSc	21-31	32-42	43-53	Over 54
UCC	2	2	-	1	-	1	1	-	1	-
KNUST	2	2	-	-	2	-	-	-	1	1
UG	3	3	-	2	1	-			2	1
CSIR-CRI	2*	2	-	-	2	-		2	-	-
CSIR-FRI	5**	3	2	2	2	1	-	1	2	2
BNARI-GAEC	5	5	-	2	1	2	-	2	3	-

NOTES: Source: Fieldwork 2011.

The scientists in the identified institutions are those who spend at least a quarter of their time on pineapple research.

2*: one of the two is pursuing a PhD research on sweet potato at the University of Ghana

5**: one of the leading scientists has taken up a job at the CSIR Head Office as the Director of Commercialization

UCC: University of Cape Coast; **UG**: University of Ghana; **KNUST**: Kwame Nkrumah University of Science & Technology; **CSIR-CRI:** Crops Research Institute; **CSIR-FRI**: Food Research Institute; **BNARI-GAEC**: Biotechnology & Nuclear Agric Research Institute, Ghana Atomic Energy Commission

Implications for the Pineapple Value Chain: In view of the relatively weak public sector-led research agenda for pineapple compared with cocoa, there is likely to be less preponderance of pineapple technological packages locally. At the crop science departments of the public universities, it was a bit of a challenge identifying scientists who spend about a quarter of their time on pineapple research. At the Crops Science Department of the University of Ghana, for instance, an examination of the database of all research undertaken by students as of June 2010, showed no documented research work on pineapple at the graduate level (MSc, MPhil and PhD), although there were couple of studies on postharvest, pest and disease undertaken by undergraduate students.

The implication is that actors, especially farmers, are more likely to explore foreign sources for technologies to address challenges. The MD2 pineapple technology represents an example of foreign technology imported into the country in a bid to respond to the challenge of satisfying the preference of the export market. This is contrary to the cocoa hybrid technology which is locally

developed to address the challenge of cocoa yield, pests and diseases.

This means actors in the pineapple value chain are likely to be less dependent on the local research system. Additionally, the research and extension systems with regard to the pineapple value chain are likely to be less linear as actors are likely to be more aggressive in exploring multiple sources of new knowledge. Besides, the study showed that linkages between the main public pineapple R & D institutions and the main extension agency (MoFA) remained weaker than that of CRIG and CSSVDCU. In view of private sector leadership in marketing, pineapple farmers were observed to be more conscious of quality issues, and were more prepared to work hard towards quality assurance.

Effects of Policy on Functioning of the Pineapple Value Chain: The case study showed that for the pineapple value chain, farmers introduced demand-driven principles to market their highly perishable pineapples by first looking for potential buyers, and entering into a memorandum of understanding with such buyers before planting. This way, they could be sure that a greater percentage of suckers they put in the soil would produce fruit which would be sold. The pineapple farmer-based organization (FBO) plays an important role in this marketing innovation. The Fotobi Cooperative Pineapple Growers and Marketers Society, an FBO in the study area, 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. This is consistent with the results of a case study of the Ugandan fishery industry, where the Ugandan Fish Processors and Exporters Association united their efforts to ensure adherence to established standards, which was one of the challenges in the industry (Kibwika *et al.,* 2009).

The paucity of local pineapple R & D activities especially in local research institutions has made actors aggressive in exploring foreign sources for technologies, which are adapted to suit local conditions. Commercial pineapple farmers, for instance, invest in innovative activities as a way of making pineapple production competitive. A typical case of such investment was exemplified at KORANCO Farm through the hiring of experts from Costa Rica to transfer the technology of growing MD2. Costa Rica is a leading country in the production of the MD2 pineapple variety, and this innovative arrangement has made it possible for KORANCO Farm to gain from the rich experience and knowledge of a competitor (E. Koranteng,KORANCO Farm, Nsawam, Ghana, personal. communication. 2010). Thanks to such an initiative, the knowledge base of the Farm in terms of the cultivation of MD2 has been broadened and the Farm is currently one of the leading centres in the country as far as the growing of MD2 pineapple in Ghana is concerned. KORANCO Farm has been selected by the Millennium Development Authority as one of the centers of out grower for MD2 pineapple (E. Koranteng, KORANCO Farm, Nsawam, Ghana, personal. communication. 2010).. Small-scale pineapple farmers in the community, through a trickle-down effect to out growers, have thus also benefited from this investment in innovation by KORANCO Farm.

Pineapple farmers' consciousness of quality issues has reflected in their efforts towards obtaining GLOBALGAP certification. 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 (Victor Mensah, Ministry of Agriculture, Nsawam, Ghana, 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 usually have the resources to be able to afford the cost. Small-scale pineapple farmers have therefore forged linkages as a means of addressing the high cost of certification. Pineapple FBOs therefore pool resources together and occasionally seek support from donor agencies such as GTZ to be able to receive certification. The MoFA also supports by running trainings for such farmers preparing for certification. In the case of 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

outgrower of 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.

Extension services delivery to the pineapple value chain was observed to be relatively highly pluralistic and more demand driven with the active participation of such private sector actors as input suppliers, processors, pineapple FBOs, and commercial pineapple farmers. Some of the commercial pineapple farmers and processors have developed the capacity to generate new knowledge through R & D activities, and there is a trickle-down effect of such knowledge to their smallholder outgrowers.. Besides, farmer-to-farmer extension through pineapple FBOs remained relatively high. These private sector initiatives in extension delivery are supplemented by the public sector extension delivery through the MoFA.

In terms of the desire for knowledge acquisition, the survey of smallholder pineapple farmers in the study area showed that 93% and 80% of pineapple famers claimed to have taken part in training and field demonstrations respectively, compared with 30% and 14% in respect of cocoa farmers. This confirms the aggressiveness on the part of pineapple farmers to broaden their knowledge base as far as the pineapple business is concerned. While for the medium to large-scale pineapple farmer the challenge for credit may have to do with its cost, small-scale pineapple farmers have to grapple with the challenge of both accessibility and cost of credit. The medium to large-scale pineapple farmer may be more likely to meet requirements, such as collateral security or submission of a business plan than the small-scale farmer, who might not be endowed financially, intellectually or materially to respond to such conditions for credit from the banks. From the survey, 66% of small-scale pineapple farmers in the Akuapem South District claimed they had never accessed credit from the bank.

CROSS-CASE COMPARISON AND DISCUSSIONS

The policy environment can either promote public sector leadership or private sector leadership in value chain functions and service provision depending on the nature of the influence of policy on the commodity value chain and its actors as a whole. While the cocoa value chain exhibits strong public sector leadership, there is a relatively strong private sector leadership in the activities of the pineapple value chain. Such private sector leadership finds expression in pineapple R & D championed by commercial farmers such as KORANCO Farm and commercial processors such as Blue Skies. Such commercial farmers and processors depend on smallholder farmers to sustain their activities and this reflects in their interest in the production activities of these small-scale pineapple farmers who may be less endowed financially, technologically or logistically. This explains the relatively stronger linkages commercial pineapple farmers have with their smallholder counterpart (as reflected in table 5) whose numbers form a critical mass of producers that sustain activities in the pineapple value chain.

Table 5. 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	41	276	89
Farmers-to-Processor	141	42	280	90

Fieldwork, 2011.

This situation was virtually absent in the cocoa value chain. In view of the strong public sector presence in the cocoa value chain, cocoa processors' interactions with cocoa farmers had remained either weak or virtually non-existent. Cocoa processors buy their cocoa beans directly from the COCOBOD through the Cocoa Marketing Company. Consequently, there is little motivation for them to establish linkages with farmers. Cadbury Ghana Limited, an international cocoa processor, represents one of the processors that has recently initiated plans to forge linkages with cocoa farmers through the Cadbury Cocoa Partnership established in 2008, to secure the economic, social and environmental sustainability of about a million cocoa farmers and their communities in Ghana, India, Indonesia and the Caribbean through long-term commitment to improving farmer livelihoods and farming communities and direct

farmer involvement alongside NGO partners and government (http.//www.collaboration.cadbury.com). From the survey of small-scale farmers, while 90% of pineapple farmers in the study area claimed to have linkages with pineapple processors, processor-producer linkages in the cocoa value chain was 42%.

Similarly, while private sector leadership in extension delivery has led to making pineapple extension pluralistic, the same cannot be said for cocoa extension delivery, which is largely public sector led through the CSSVDCU of the COCOBOD. Processors, input suppliers and farmer-based organisations are important sources of extension messages; however, the rather weak farmer-processor, farmer-input supplier and farmer-to-farmer linkages in the cocoa value chain have limited the opportunities for these value chain actors to contribute to extension delivery. In the survey, for instance, while 96% of pineapple farmers in the study area claimed to belong to one FBO or the other, 42% of cocoa famers claimed membership of FBO.

Private sector leadership in the marketing of pineapples has made producers more aggressive in exploring innovative marketing arrangements. Internal marketing of cocoa although public sector driven, has also witnessed some amount of private sector participation through the activities of 26 private LBCs and one public LBC. However, this has not translated into bringing about the needed improvement. This is consistent with the conclusions of Ayres (1995) that suggest that the conversion of a public monopoly into a private monopoly is likely to bring few, if any, benefits and may conceivably have negative effects. Ayres (1995) further explains that privatisation without any change in market structure may not create any benefits in the case of a monopoly enterprise. According to Laven (2007), Ghana remains the only cocoa producing country in the world without a fully liberalised marketing system. An attempt to introduce private sector participation in a highly public sector regulated marketing system made cocoa farmers less conscious of quality issues. Unlike the marketing of pineapple, which is private sector led, pineapple farmers were observed to be more conscious of quality issues.

Table 6: 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	Public-private
	Marketing	Public-private	Finance	Private
Pineapple	Production	Private	R & D	Private-public
	Input supplying	Private	Extension	Private-public
	Processing	Private	Pest/Disease	Private
	Marketing	Private	Control	Private
			Finance	

Source: Field Work, 2011 Note: Public-Private =Public outweighs private; Private-public-private outweighs public.

It is much easier for a cocoa farmer to pay back credit advanced by a bank than a pineapple farmer. This is because the cocoa farmer has ready market for the produce; LBCs are ready to buy cocoa beans, in some instances, irrespective of the quality and COCOBOD becomes the final off-taker. For the pineapple farmer, the market is highly competitive with its stringent quality requirements. In spite of this fact, the survey showed more cocoa farmers (84%) claiming they had never accessed credit from a financial institution than pineapple famers (66%). This shows the relatively more aggressiveness on the part of pineapple farmers to explore ways of addressing challenges such as finance.

CONCLUSIONS AND POLICY IMPLICATIONS

This paper concludes that a policy environment that promotes public sector leadership in value chain functions and service provision tends to reduce the motivation for value chain actors to exhibit innovativeness. For small-scale cocoa farmers, such leadership makes them less aggressive in exploring new options at addressing challenges and reduces their consciousness as far as quality issues are concerned. On the other hand, the study shows how private sector leadership can promote choices and create more space for the participation of private sector actors, making support services more demand-driven and more pluralistic. This study shows that private sector leadership in value chain functions, consistent with the conclusions of Furubton & Rejovich (1972); Alabi & Mafimisebi (2004); and Hall & Lobina, (2005), promotes

efficiency and effectiveness in value chain activities, increasing the motivation of actors to forge linkages towards interactive learning, out of which actors are able to build their capacity to respond to challenges in the industry. Besides, it reduces the linearity associated with the research and extension system.

The implication for policy is 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 sustaining activities in agricultural commodity value chains. This may introduce the needed pluralism in support services such as extension delivery, and increase the competitiveness of value chain activities for higher productivity.

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