

Full Length Research Paper

Assessing Ghana's initiative of increasing domestic rice production through the development of rice value chain

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Abstract

This paper sought to contribute to the on-going discussion on improving rice production in Ghana. The objective of the study was to analyse the effect of rice value chain development initiative on domestic rice production in the Ahafo Ano North district of Ghana. Primary data for the study gathered through focus group discussions and key informant interviews was complemented by desk studies. The main finding was that the rice value chain was not formalized in the district, although informal types existed. The study also showed that domestic rice producers had achieved regular annual increases due to informal rice value chains. Nevertheless, there was lack of competitiveness of domestic rice vis-à-vis imported rice due to the poor quality of milling. Therefore, the study recommended: (i) adopting sector-wide value chain strategies that would enhance development of formal rice value chain and competitiveness of local rice industry; and (ii) investing in post-harvest product-quality infrastructure to ensure product quality.

Keywords: Ghana's initiative for rice industry, domestic rice production, value chain development

INTRODUCTION

Local rice production has not been able to meet the increases in demand triggered by population growth, rapid urbanization and change in consumer habits. The fast-growing demand for rice is driving interest in expanding Ghana's own rice production. Currently, there are interventions to boost domestic rice production. Among all the several efforts geared towards increase in rice production, the development and strengthening of rice value chain appear to be the most remarkable. Food and Agricultural Sector Development Policy for 2009-2015 (FASDEP II) recognizes the importance of supporting agricultural growth through value chain development. Although the initiative is a relatively new

approach to support local rice industry, it is gaining prominence and becoming the centrepiece of development strategies in the rice sector. Before the emergence of this initiative, successive governments and donor agencies focused almost all rice development efforts on production. Even though this exclusive focus on production yielded the expected result, less attention was given to post harvest management issues which has resulted in an enormous hindrance to the competitiveness of the local rice industry in Ghana. Past efforts that led to, increasing rice production alone has been found to be unsustainable unless strong linkages with existing market systems exist.

Rice value chain describes the roles and relationships of the various actors within and along the chain, and how they are linked to existing market system. It describes the flows of the rice commodity and value-adding activities

between the different actors of value chain to the end users. The Ghana's rice value chain initiative emphasizes on the creation and strengthening of both horizontal and vertical linkages of the chain. The government believes that the development of rice value chain will increase competitiveness, increase production, contribute to food security and address what past initiatives failed to acknowledge - end markets and private sector actors. With this new initiative, producers can gain access to modern markets so that there is an interaction of poor rural men and women producers with the end market. Lots of benefits are documented in the literature to be associated with the development of rice value chain. In the broader context, rice value-chain development and upgrading have significant implications for food security, poverty alleviation and overall economic development (Demont and Rizzotto, 2012). The emergence of rice value chain development constitutes a fundamental change in the rice sector by organising the sector into a sustainable and competitive one (Loosvelt and Defoer, 2010). The value chain development generates higher profits and creates mutually beneficial outcomes for all stakeholders involved, especially the rural population and entrepreneurs (Hobbs et al., 2000).

After about a decade of pursuing this initiative, there is a dearth of empirical evidence to show the effect of the rice value chain development initiative on domestic rice production. The objective of the study is to analyse the effect of rice value chain development initiative on domestic rice production in the Ahafo Ano North district of Ghana. The specific objectives of this paper are to: (1) analyse the current status of rice value chain initiative; (2) identify constraints of rice value chain development in Ghana; (3) identify the role of stakeholders in the development of rice value chain in Ghana and (4) assess the effect of rice value chain development initiative on domestic rice production. This study explores the hypothesis that the development of rice value chain can promote domestic rice production in Ghana. The debate on how to create and develop rice value chain in a sustainable way, based on appropriate strategies and policies is still unfolding, and the empirical context the study provides will enhance the discussions.

The rest of the paper is organised into four sections. A brief review of literature follows this section. Section three describes the data collection and analysis. Empirical results and discussion are presented in section four whilst conclusion and recommendations of the study constitute section five.

LITERATURE REVIEW

The concept of value chains, which was developed in the 1960s and 1970s to aid the analysis of mineral exporting countries, became widely known and popularized in the

1980s as a business tool to analyze and assess upgrading of technologies and processes in individual firms before being applied more broadly to supply chains and distribution (Porter, 1985; Schmitz, 2005). The original concept rests on the idea that a firm can develop strategies to improve and maintain its competitive advantage by disaggregating its core activities and quantifying the value of each activity (Stamm, 2004). This concept has been extended beyond individual firms to whole supply chains and distribution networks. Available literature describe value chain as the full range of activities required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers and final disposal after use and beyond (Pietrobelli and Saliola, 2008; Kaplinsky, 1999; Kaplinsky and Morris, 2000). This includes activities such as design, production, marketing, distribution and support to the final consumer (Cunningham, 2001). A value chain for any product or service extends from research and development, through raw materials supply and production, through delivery to both local and international buyers, and to disposal and recycling.

Food value chain is a relatively new approach to agricultural development. Although food value chain is a relatively new approach to agricultural development, the thinking about entire chains from production to consumption and increasing the share of value captured by farmers is not new to agricultural development (Altenburg, 2007). Food value chain is gaining prominence and becoming the centerpiece of agricultural development strategies globally. The emerging food value chain approaches go somewhat further from interventions that develop input and outputs markets in general to making more focused interventions to improve the competitiveness of selected commodities. In agriculture, a value chain is defined as a strategic vertical alliance of non-adversarial relationships between stakeholders within food supply chain (Hobbs et al., 2000). It seeks to streamline output channels by linking producers to consumers and weeding out inefficiencies along the way, from production to the final consumer (Rizzotto and Demont, 2010). Thus, a value chain constitutes a 'chain' of activities that link producers to consumers, and each activity adds 'value' to the final product (Making Value Chain Work Better for the Poor).

In Ghana, the rice value chain comprises production, post-harvest activities until it gets to the final consumer (Kula and Dormon, 2009). Rice value chain in Ghana brings together all groups (that is, researchers, investors, fertiliser providers, seed suppliers, rice producers, credit institutions, processors, and consumers) and explores ways to reorganise the local rice industry to boost local production and decrease dependency on imports (Loosvelt and Defoer, 2010). The main identified

actors of the rice value chain in Ghana are: Input suppliers; Producers; Bulklers; Processors/Millers; Wholesalers; and Retailers (Coles and Mitchell, 2010). The rice value chain, actors perform certain functions, which typically include input supply, production, processing, storage, wholesale (including export), retail and consumption. There are also secondary actors, or ancillary workers, who provide services to support the main actors. These services include transportation, brokerage and processing of documents among others). The actors who perform similar functions are regarded as occupying the same functional 'node', referred to as, for example, the input supply node, production node, retail node, and so on (Osei-Asare, 2010).

In order for the value chain to function efficiently, there should be well-established vertical and horizontal linkages in the supply chain. As cited in Coles and Mitchell (2010), the horizontal coordination is composed of the development of relationships among actors within functional 'nodes' such as formation and strengthening of producers' groups (Naved, 2000). The vertical coordination focuses on the development of relationships among actors between nodes such as farming to a contract (Raynolds, 2002). Many different sub-value chains ranging from own production and storage with interaction with small local millers only to highly specialised rice export commodity supply chains with complex certification systems, can be found in Ghana. Within this, the main feature of smallholder production stands firm. The knowledge system they work in or with plays an essential role in their capacity to participate in one or another supply chain. By linking producers to consumers through a shared objective, value chain presents a more sustainable approach to consumption and production than segmented and adversarial production chains (Demont, 2010).

In Ghana, value chain is increasingly being seen more specifically as an important approach to agricultural development. This is because it explicitly recognizes the role of the private sector, agricultural markets and institutions that rarely function efficiently. While the approach offers valuable tools for identifying points for intervention (Webber and Labaste, 2009), there is less clarity on what the interventions should be. Value chain is expected to involve actions such as facilitating changes in behavior, transforming relationships, targeting leverage points and empowering the private sector. It has been documented that the rice value chain includes intrinsic network of public and private interactions and responsibilities (Campbell *et al.*, 2009). The public responsibilities are often in infrastructure (e.g. roads and irrigation), policies and regulations (e.g. seed laws, use of inputs, export policies, tax incentives, etc.), research and development (variety selection, etc.) and agricultural extension. The private responsibilities are concentrated along the supply chain from provision of inputs through production to processing and trade. The strategy that

address major constraints and opportunities in value chains includes activities such as either facilitating access to inputs, or strengthening delivery of business and financial services or increasing access to higher value markets. These wide ranges of interventions are employed in Ghana to strengthen the competitiveness of rice value chains.

METHODOLOGY

The study sought to assess the effect of rice value chain development on domestic rice production in the Ahafo Ano North District of Ashanti region of Ghana. Prior to the fieldwork, a thorough literature review to examine key issues associated with rice value chain development, both inside and outside of Ghana, was undertaken to learn from those studies and to contextualize the work. During the desk review, it was found out that there was not adequate information on the subject matter. As a result, a qualitative descriptive exploratory design offered the best approach for the study since it helped gather lots of information to enrich the report.

Following the initial desk study, simple random sampling was used to select five out of twenty rice producing communities in the district by use of assigned random numbers from random number tables. The five communities sampled were Odikro Nkwanta, Tepa (Katabo), Manfo, Katabo and Anhwiafoto. Purposive sampling technique was used to select actors who had performed their functions for more than five years. Apart from conducting two focus group discussions (comprising ten respondents each) with the farmer group, a single focus group discussion (made up of ten respondents) was conducted with each of the remaining functional nodes. A total of 76 respondents were interviewed for both the focus group discussions and key informant interviews. The respondents of the focus group discussions comprised 44 males and 26 females along the rice value chain. The topic guide used was slightly structured in nature and covered areas such as current status of rice value chain development, constraints to its development, the role of stakeholders and the effect of rice value chain development on domestic rice production.

The primary data gathering followed three sequential steps. Firstly, semi-structured interviews were conducted with selected facilitators of rice value chain from three relevant institutions namely Ministry of Food and Agriculture (MoFA), Northern Rural Growth Development Project (NRGDP) and Self Help International, an NGO in Ashanti region. Open-ended questions were used to engage six facilitators from these institutions to solicit their views on a wide range of issues on value chain including its status and relevance in the domestic rice production.

Secondly, we embarked on Focus Group Discussions with both male and female Rice Value Chain Actors

(VCAs) to triangulate information gathered from earlier interviews. Interview protocols were used to facilitate focus group discussions and key informant interviews of selected key actors of the rice value chain. Learning questions (including: How does rice value chain function in this district?; Who are the facilitators of the rice value chain in this district?; What is the role of government in rice value chain development?; Who are the main actors of rice value chain and what are their functions?; What are the main constraints in rice value chain development? etc.) were answered in a participatory mode at the focus groups discussions and key informant interviews. A lot of informal discussions to probe issues of concerns were done and relevant observations were made and documented for the study. The respondents (comprising ten in each group along the chain) at these interviews were selected across all categories of chain actors and other stakeholders including private input suppliers, producers (two groups interviewed from this category), processors, traders, and consumers. Thirdly, interviews were complemented by a literature review that was developed from a composite of country studies and additional literature outside the country. The data was analysed qualitatively using in-depth assessment of the various thematic areas.

RESULTS AND DISCUSSIONS

Four thematic areas emerged from the interview transcripts: status of rice value chain initiative; constraints to rice value chain development; the role of stakeholders in rice value chain development; and the effect of the rice value chain development initiative on domestic rice production. These thematic areas have been discussed below.

The Status of Rice Value Chain Development Initiative in Ahafo Ano North District

Respondents were encouraged to assess the current status of the rice value chains in the district. It was found that there were no formalized rice value chains in the district, despite its substantial production potential. The channel through which local rice was sold has weak linkages among farmers, millers and others performing similar functions. This is consistent with the findings of Campbell *et al.* (2009) indicating that in Ghana, linkages are generally weak in all channels among actors performing similar functions along rice value chain. This was attributed to lack of trust among the actors of the value chain. They also indicated it was due to the lack of a common understanding of the benefits accruing from linking up with others. The respondents outlined the informal rice value chain as follows:

Input suppliers: Government through research-extension linkage had provided improved rice production inputs to the producers. In addition, farmers procured inputs from private entities at the local and urban market centers. The inputs in the retail shops were sold to smallholder farmers and a few commercial producers for the production of rice. Certified seed was mostly not available in local input shops, so farmers purchased it from Ministry of Food and Agriculture (MoFA) or resorted to re-using their own seed, which contributes to low productivity. Extensive government control and involvement in seed multiplication and distribution minimized private input suppliers' involvement in the distribution of certified seeds in accordance with market demand.

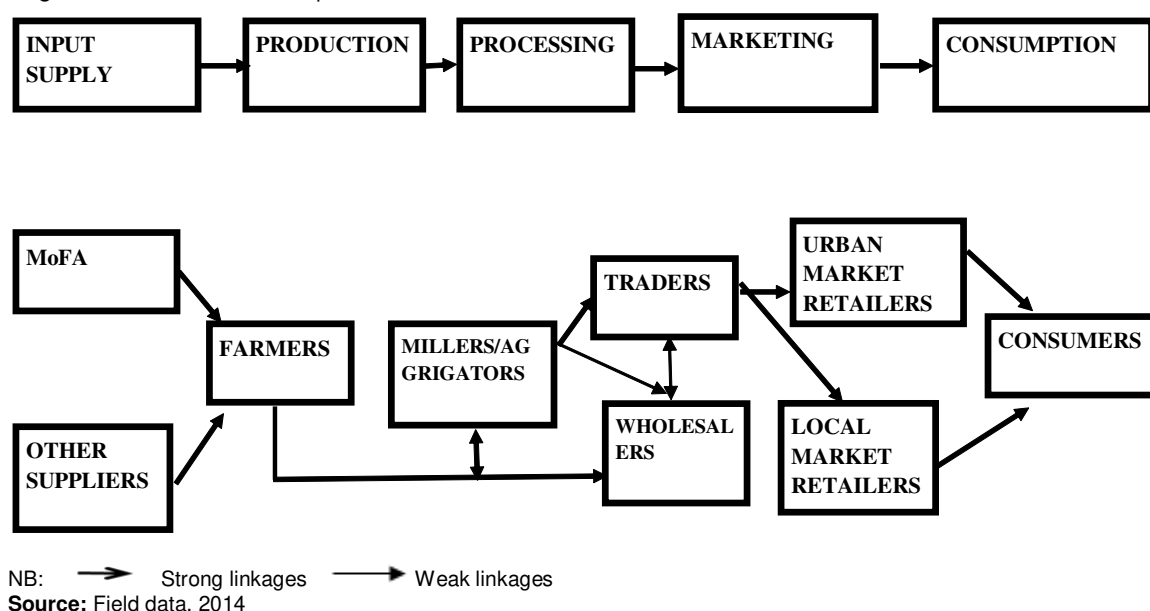
Producers: Rice cultivation was done by smallholders with holding sizes ranging from 0.4 Ha to 1.2 Ha. Almost all producers sold a certain proportion of their produce for cash and consume the rest after harvest. Although the smallholders constituted large number of participants of the value chain actors, there was lack of co-operative among them due to lack of trust. Farmers transported their paddy directly to millers for processing because there was no trader group in the district to purchase from them. Absence of trader groups served as disincentive to the smallholders in the district. On a relatively small scale, farmers milled their paddy and sold to traders or local retailers. Sometimes the activities of the smallholders were pre-financed by the millers and repayment was done in kind.

Millers: Rice Millers formed part of the processor group. They either milled farmers' paddy at a fee or served as aggregators to purchase paddy from farmers, processed and sold either to wholesalers or local traders or retailers. Generally, millers were quite few compared to the number of rice producers. Apart from one improved milling facility jointly owned by government and a private entity, the rest of the mills were all privately owned at the district capital. Most of the private mills used obsolete equipment for processing which compromised the quality of the polished rice.

Wholesalers: These were rice traders operating in large shops, selling mostly in large quantities of 25 or 50 kg bags/sacks. They operated in the big cities and functioned as intermediaries between millers/ importers and traders.

Traders: They purchased milled rice either from producers after processing at the milling centers or from the millers. The traders usually sold about 70% of the milled rice to retailers during local markets days and the remaining 30% to retailers at the urban markets in Kumasi, the second largest city after Accra, the capital city of Ghana.

Retailers: Retailers procured rice from either traders or farmers or millers and sold in smaller quantities to

Figure 1: Rice Value Chain Map, Ahafo Ano North District of Ghana

consumers. They sold rice in bags of various sizes, as well as in bowls and tins.

Consumers: They were the end users of the polished rice. The consumers purchased from retailers in the local markets in smaller quantities. The consumers to some extent determined the type and quantity of rice produced and milled for retailing.

The functions, product flows and economic actors along the rice value chain from small-scale producers through to end consumers at the district is shown in [Figure 1](#)

Constraints to the Development of Rice Value Chain in the District

It was observed during the study that there were several factors that militated against the development of rice value chain in the district. One of the most important factors identified during the key informant interviews was incoherent governmental agricultural sector and national trade policies. According to the key informants, rice import tariff variability and tax policies did not favour local rice production but rather allowed the import of cheap rice which impacted negatively on value chain development. It was also found out that the rice value chain was not well organised or coordinated nationwide. Furthermore, the Ministry of Food and Agriculture did not have a well-developed strategy to promote the rice value chain development although FASDEP II supported this initiative. It was further reported that there were inadequate rice value chain facilitators to ensure the development of well-functioning rice value chains in the district. It was indicated during focus group discussions that there was a weak agricultural extension services to

farmers leading to poor knowledge on current best practices in rice production. Due to inadequate provision of extension services in the district, rice millers intimated that they had taken it upon themselves to provide extension services in post-harvest management to rice producers to ensure provision of quality product that would satisfy consumers.

Again, data from the field revealed that the land tenure system was a constraint to rice production and rice value chain development because of its general effect on both access and security. It was reiterated that the tenure system tended to limit the size of holdings and investments towards land improvement, especially in the lowland rain fed ecology. Land tenure constraints and uncertainty regarding who holds usufruct rights reduced investment in irrigation and other land improvements. It must be mentioned that our respondents pointed out that there was a large rain fed lowland ecology that was suitable for rice production but remained largely unexploited due to the land tenure system in the area.

Respondents further indicated that although there were financing schemes available for cooperatives, lack of cooperatives among actors within the chain had prevented them from taking advantage of such schemes. It was observed that in the local rice value chain channel, actors acknowledged each other and exhibited some collaborative behaviour to obtain assistance, but in reality they did not exist as a group. The weak linkages in a rice value chain channel had difficulty in cost-effectively getting product in volume and quality to market. As had been reported, by linking producers to consumers through shared objective, value chain presents a more sustainable approach to consumption and production than segmented and adversarial production chains (Demont, 2010).

Unavailability of local rice throughout the year was also found to be a major problem to the development of the rice value chain. The field study showed that supplies of local rice were abundant just after harvest and dwindled thereafter because of lack of adequate incentives for storage. As a result, wholesalers and traders could not guarantee regular supply of domestic rice which served as disincentive to patronage of local rice. This is consistent with a study conducted in Ghana which reports that Ghanaians prefer imported rice to locally produced rice due to unavailability of local rice in sufficient quantities all year round (Diako *et al.*, 2010). It was also observed that apart from erratic supply of paddy, there were inadequate large-scale improved milling facilities which affected the quality of locally produced milled rice. Millers reported during focus group interview that limited access to large-scale processing capacity prevented actors from accessing larger markets and to make profitable investments in the supply-chain to improve productivity, quality and capacity. According to respondents, poor quality or inappropriate equipment for processing rice compromised the ability to consistently produce sufficient and good quality rice, which reduced competitiveness, particularly in cleanliness and uniformity, in the fast-growing rice market which hindered the development of rice value chain.

Discussion with millers also revealed that their major problem was lack of competitiveness of local rice vis-à-vis imports due to the poor quality of milling and a policy environment that discouraged investment in mills capable of producing rice that was competitive. This problem of the competitiveness of local rice production was also prevalent in all parts of the country. Locally produced rice was of poor and variable quality leading to low patronage and uncompetitive to the imported rice among consumers particularly the urban population. This is consistent with a study which indicates that rice produced locally in sub-Saharan Africa (SSA) suffers a significant price discount in comparison with imported rice due to perceived differences in quality (Frédéric and Hélène, 2007). Locally produced rice generally has more impurities mixed with it and is not of uniform grain size and colour (Campbell *et al.*, 2009). This was mainly due to the poor post-harvest handling of the crop resulting in quality defects such as presence of stones, varietal mixtures and mouldy grains. Respondents reported inadequate standard milling machines equipped with pre-cleaners, de-stoners, hullers, polishers, paddy separators, aspirators, and graders which contributed to the generally poor quality of milled rice in the district. In addition to the poor milling quality were the poor distribution and storage systems. It was emphasized by respondents that the situation had created low profitability in the rice industry in the district and proposed improved rice processing techniques aimed at increasing the acceptability, marketability and consumption of local rice.

The Role of Stakeholders in the Development of Rice Value Chain in the District

We explored the role of stakeholders in the chain development during our interviews. The role of the government, public sector, private sector, NGOs and actors of the rice value chain were considered crucial for the development of rice value chain in the district during the key informant interviews. Respondents stressed the importance of all levels of the chain, all major policies and supporting institutions, working together to achieve well-functioning rice value chains and promote increased production and food security. The role of governance, which controls the power relationships within the chain, was mentioned to be very central to achieving well-functioning rice value chain. In addition, it was proposed that the government (the state) has to put in place a framework of institutions, as well as essential services and infrastructure that will enable a society to function to meet its social, economic and environmental goals. The field study showed that due to the failure of the government to provide these basic needs of the society, small scale Rice Value Chain Actors (VCAs) were particularly dependent on private services (including provision of infrastructure such as roads, storage and milling facilities) to function due to their limited assets. Respondents reiterated that the inadequate public infrastructure was a critical factor influencing the investment strategies of agribusinesses and their degree of willingness to engage with small-scale actors.

Another emerging trend in service provision that was found to be very crucial to the development of the chains during the study was the development of public-private partnerships. Nevertheless, these partnerships were difficult to find in the district. This kind of partnership may include the establishment of market infrastructure and provision of other support to new business models. If this kind of partnership existed, government and private sector businesses could share in the investments costs and risks, which would provide a mix of public and private benefits. The actors of the private sector often influence the direction of change in the value chain than the state. For instance, private rather than public standards had become the main driver of food quality and safety. In the advanced countries, for instance, the private sector often steps in to provide market infrastructure, extension advice, financial services and inputs. It was found out during the field study that the important private sector operators included both the actors within the market chain (traders, processors, transporters and retailers) and the financial bodies that provided credit and insurance. Increasingly, all required an element of collaboration with other players within and beyond each link in the value chain, not only between private companies but also between the public and private sectors.

The critical role of the private sector to ensure well-functioning value chains were also identified during the key informant interview. The development of private sector operators (firms) along the chain was regarded by most of the respondents during key informant interview as fundamental to the overall progress of chain development. Respondents indicated that much of the value added in the food chain happened at the processing stage. As a result, processors had a vital role to play by investing in infrastructure required to meet the demand of the emerging markets. Again they indicated traders played a vital role in facilitating a change at the processing stage as well as ensuring that quality products were sold at the market. They reported that as a primary interface with the consumer, retailers in addition to responding to consumer preferences played a significant role in influencing the market, especially in matters concerning healthy eating and sustainability. They concluded that the rapid growth of retailers in emerging markets would eventually lead to more efficient supply chains, including less waste, lower prices for the consumer and safer food.

The Effect of Rice Value Chain Development on Domestic Rice Production in Ghana

To this point, the study sought to find out from respondents how rice value chain development in Ghana has contributed to domestic rice production in the district. Respondents intimated due to lack of formalised value chains in the district, the channel through which local rice was sold had weak linkages among producers, millers and others performing similar functions. They were quick to admit that although the rice value chains were not formalised, the chains were functioning to some extent in the district. The respondents reported that because the actors were able to link up to other actors informally, they considered the value chain operational. They claimed domestic production had increased progressively over the last decade due to the spill over effect of the rice value chain development initiative being pursued by Ghana. Respondents pointed out that currently, producers had gotten ready market for their produce due to the emergence of the rice value chain initiative. According to respondents, due to the availability of ready market for their produce at a reasonable price, rice production had become a very lucrative business in the district, attracting many people into rice production. Furthermore, respondents indicated that the rapid increase in penetration by large number of retailers had brought with it more efficient supply chains.

While some increases were attributed to improved yields, majority of the farmers assigned higher yields to expanded areas of production. However, they were quick to say that the increase in production was unsustainable in the absence of major improvements by actors

responsible for linking producers to markets. They said these production increases had failed to spur investments in mechanized or commercial rice production or in larger-scale processing and milling capacity. From the discussions, it was found out that the absence of sector investment is due to: i) weak markets and distribution of rice seed, ii) limited commercial rice production, iii) limited large-scale processing and poor marketing, and iv) an enabling environment wrought with challenges such as incoherent governmental agricultural sector and national trade policies.

There was a perception expressed by the producer groups during focus group discussions which was summarized in the following statement:

We understand that since the establishment of the improved rice milling facilities at the district capital, wholesalers give large sums of money to millers to double as aggregators and purchase large quantities of paddy from farmers. The millers send these large quantities of paddy rice to the improved rice milling facility to mill and re-fill imported US long grain 25 kg and 50 kg empty bags with the local polished rice for the wholesalers. The wholesalers sell to the traders and retailers as imported rice in the urban centres.

According to the respondents, the district was currently producing high quality rice product which was able to compete very well with imported rice. They concluded that when attention is given to rice value chain development initiative in the district, it will go a long way to boost domestic rice production and achieve food security in the farm households in the district, and reduce rice importation to Ghana.

CONCLUSIONS AND RECOMMENDATIONS

The rice value chain in Ghana, as exemplified by the study in the Ahafo Ano North District, is not formalized, although Ghana stands to gain immensely if this is achieved. It is possible to achieve a formalized and well-functioning rice value chain in Ghana when a holistic approach to chain development is taken. In order to develop sustainable rice value chain in Ghana, the study recommends that there is the need to offer strategic support (such as infrastructural development, efficient transport system, storage facility and guaranteed price) to Rice Value Chain Actors (VCAs) for production of quality rice. Also, there is the need to build the capacities of rice value chain operators in post-production handling of rice. Again, an in-depth analysis was done during the study to identify challenges to the development of rice value chain in the district. The study observed that one of the critical challenges to domestic rice production is land tenure system of the study area. Increased commercial or economically viable agricultural systems will require more secure land tenure rights, since land tenure insecurity is a

disincentive for investments in land and soil improvement technologies, especially those with long-term benefits. This study also identified that another critical challenge in the development of Ghana's rice value chain is the governance of quality throughout the supply chain, whereby quality should be tailored to the preferences of the end-market consumers (Rizzotto and Demont, 2010). According to the study this challenge could be overcome through investing in production and post-harvest handling technologies, infrastructural investment, institutional change and policy reform. In addition, national rice value chain competitiveness strategies are required to ensure the supply of rice in the quantity and quality needed to effectively compete with imported rice in urban markets. It is also important to have strategic plan in place to provide guidelines that will give support to post harvest handling of rice in relation to processing, storage, distribution and marketing of paddy to enhance quality of milled rice production, competitiveness, marketing and consumption. The study recommends: (i) investing in infrastructure to ensure post-harvest product quality, and (ii) adopting sector-wide value chain strategies that enhance chain competitiveness. The roles of the various stakeholders' especially that of the public and private sectors, have also been highlighted to suggest the way forward for achieving well-functioning rice value chain in Ghana.

LIST OF ABBREVIATIONS

Abbreviations	Meaning
BIRD	Bureau of Integrated Rural Development
FASDEP II	Food and Agricultural Sector Development Policy for 2009-2015
MoFA	Ministry of Food and Agriculture
NRGDP	Northern Rural Growth Development Project
VCAs	Value Chain Actors

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