INNOVATIONS IN AGRICULTURE AS DRIVER TO KENYA'S ECONOMIC GROWTH
ENTREPRENEURSHIP DEVELOPMENT

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ABSTRACT

The Agriculture sector is the backbone of Kenya's economy directly contributing 26 per cent of the Gross Domestic Product (GDP) annually and another 25 per cent indirectly. The sector accounts for 65 per cent of Kenya's total exports and provides more than 70 per cent of informal employment in the rural areas. The sector therefore is not only the driver of Kenya's economy but also the means of livelihood for the majority of Kenyan people. The Agriculture sector is largely dominated by micro and small enterprises (MSEs) that have low levels of innovation occasioned by low adoption of improved technologies leading to low productivity. These MSEs are also characterized by over reliance on labor intensive and low productivity technologies as well as over-reliance on rain fed agriculture and minimal irrigation use. The sector also lacks dominant enterprises and farming systems, a fact which complicates adoption of innovations in the sector. Innovative practices in the agriculture sector such as agro-processing and others have

been identified to improve rural incomes by adding value to the produce; save on transport costs by delivering high-value/low-volume products and create opportunities for use of by-products as inputs in other farm operations.In the quest to innovate, agribusiness firms engage in networks and create links. However, such links are still weak and need to be strengthened through networking and collaborative research and dissemination of results into the communities. Private-public partnership policies, especially through business and collective associations, have proved important in addressing agricultural innovation challenges. Therefore, the study recommends a policy framework to encourage private participation in agricultural production activities. Public-private partnerships must be strengthened and extended beyond the traditional field of research and development (R&D).The key objective of this study was to investigate the role of agricultural innovation practices in influencing economic growth. Specifically the study sought to establish the contribution of innovation in agricultural production practices, agricultural value addition practices and agricultural marketing techniques in economic growth. The study employed desktop research by reviewing relevant research texts, scientific journals, websites, agricultural publications and magazines.

The study found that productivity is improved with enterprises earning more as depicted in the public-private partnership between agricultural input suppliers and the Kenyan government through the Kenya Horticulture Development Program (KHDP) in Western Kenya.The greenhouse innovation in tomato farming to addressed issues of seasonality and input intensity, improved marketing and production, and increased smallholder incomes.

The Innovative practices in the Agriculture sector such as agro-processing and others,improves rural incomes by adding value to the produce; save on transport costs by delivering high-value/low-volume products and create opportunities for use of by-products as inputs in other farm operations such as animal feeds, manure and fuel. Secondly, innovative practices in the Agriculture sector provide opportunities for reducing farm losses through conversion of perishable commodities into more durable products. It was also found that expanding farmer access to formal marketing channels depends on innovative responses to distances and maintenance of the cold chain in perishable agricultural products sector, andit was determined that innovations in the agricultural marketing system potentially match innovation in processing, with potential spillover into production technology and quality standard

INTRODUCTION

Today, many institutions at the national and international level pay increasing attention to innovation and how it can best be nurtured (World Bank, 2006; Röling, 2009). A dynamic innovation landscape is considered essential to provide some of the answers required to adapt to a fast-changing world in which climate change, increasing urbanization, globalization or concerns with the preservation of the environment all contribute to re-assessing the values, performance and current practices of economic actors (World Bank, 2006). This trend also affects the agricultural and rural development sector and especially developing countries where many people still depend on agriculture for their livelihoods.

Yet an accurate and fact-based understanding of innovation systems and processes in agriculture remains limited (Rajalahti et al., 2008). The Agriculture sector is the backbone of Kenya's economy directly contributing 26 per cent of the Gross Domestic Product (GDP) annually and another 25 per cent indirectly (RoK, 2010). The sector accounts for 65 per cent of Kenya's total exports and provides more than 70 per cent of informal employment in the rural areas. The sector therefore is not only the driver of Kenya's economy but also the means of livelihood for the majority of Kenyan people (RoK, 2010).

During the first two decades after independence, Kenya's economy grew on average by about 6% per year (RoK, 2008). This robust growth was associated largely with the growth registered in agriculture during the same period (Murithi, 2009). In the last two decades, however, the economic growth was on the decline (RoK, 2009). Towards the end of year 2002, the economy grew by negative 1.2 per cent, mainlydue to the sharp decline in agricultural growth (Muteti, 2010). The situation in the Agriculture sector is largely due to the fact that, it is 80% dominated by micro and small enterprises (MSEs) that have low levels of innovation occasioned by low adoption of improved technologies leading to low productivity (Kipkurui, 2009).These MSEs are also characterized by over reliance on labor intensive and low productivity technologies as well as over-reliance on rain fed agriculture and minimal irrigation use (Abiola, 2008). The sector also lacks dominant enterprises and farming systems, a fact which complicates adoption of innovations in the sector (Wanjohi & Mugure 2008).

Problem Statement

Kenya continues to be faced with food crisis and currently about eighty percent of the population is food insecure (UNDP, 2010).Kenya's economy being Agriculture led, the Agriculture sector is expected to not only lead inensuring food security in Kenyans but also in wealth and employment creation for the ever increasing population (RoK, 2010; Agriconsotium, 2008).Further, the sector is expected to drive the country to achieve the ten percent annual economic growth rate as envisaged under the economic pillar of the country's vision 2030(RoK, 2010).In order for the Agriculture sector to effectively play these roles; there is need for increased agricultural productivity among the dominant players in the sector that is micro and small enterprises(Murithi, 2009).

According to Bala, Mathirajan &Krishnswamy(2008) innovation enhances firms /farms competitiveness in form of quality improvement, cost reduction, extension of product and increased productivity. Innovative practices in the Agriculturalsector include use of improved crop and livestock husbandry practices, use of improved inputs, use of improved irrigation practices, value addition and agro-processing as well as improved marketing strategies among agricultural products and services (Ngee, 2007).The National Agricultural and Livestock Extension Programme (NALEP) (1999) report established that value addition in production and marketing activities in agricultural sector solved many problems that affected sustainable agriculture in many ways that were obvious to the local people. The MSEs in this sector thus need to engage in these innovative practices to enhance their productivity and that of the sector (RoK, 2010).

However,all the above notwithstanding majority of the micro and small enterprises in this sector continue to be characterized by low levels of innovation occasioned by low adoption of improved technologies leading to low productivity. This is despite benefits of innovation in enhancing firms /farms competitiveness and productivity (RoK, 2010).

Research Objectives

The key objective of this study was to investigate the role of agricultural innovation practices in influencing economic growth. Specifically the study sought to:

a. Establish the contribution of innovative agricultural production practices on national economic growth.
b. Investigate the role of agricultural value addition practices on economic growth.
c. Find out the benefit of agricultural marketing techniques in economic growth.

Justification

The economic growth of Kenya is dependent on Agricultural (RoK, 2006; RoK, 2010). The information from this desk study can be used to inform policy makers in this country on the progress and uptake on innovation in spurring growth in the Agricultural sector and hence the growth of the National economy. The entrepreneurs in micro and small Agro-enterprises can use the findings to enhance innovation activities in their enterprises for increased growth and productivity. The findings will also contribute to the existing body of knowledge of innovations along the agricultural value chain in SME Agro-enterprises in Kenya.

LITERATURE REVIEW

Innovation is defined as the process by which firms master and implements the design and production of goods and services that are new to them, irrespective of whether they are new to their competitors, their countries or the world (Mytelka, 2007). In this framework, innovation has its sources in a wide variety of places and in activities such as R&D, design, production, quality control and marketing (Oyelaran-Oyenyinka & McCormick, 2007). According to Jovanovic (2000) there have been attempts to provide an overview and clarify the key factors that cause some economies to grow rapidly, while others remain small or grow very slowly. Passanen (2003) notes that any investigation on factors affecting the growth of economies has to consider at least two different streams of literature: theories about firm growth and theories about entrepreneurship. Jovanovic (2000), further states that the aim of growth theories is to describe

the growth process and to identify typical features that make growing economies stand out from other economies. Cuervo, Ribeiro & Roig (2007) are of the view that entrepreneurship theories try to explain characteristics which differentiate successful economies from less successful or unsuccessful ones. This study therefore, was guided by innovation theory of profit and endogenous growth theory.

Innovation Theory of Profit

The theory suggests that profit is the reward for successful introduction of innovation. Moreover, the value of innovation decreases with more competitors and increases with more users (Freel, 2004). This theory is based on work of Schumpeter which emphasizes the role of entrepreneurship and the seeking of opportunities for novel value-generating activities which would expand and transform the circular flow of income (Hoffman et al, 1998; Mytelka, 2007). According to this theory, innovation capacity and economic performance are much more the result of smooth interplay between the stakeholders of the firms than of high-tech or intensity of research and development.

Combining Schumpeter entrepreneurial theory with the profit strategy approach shows that innovation needs to be embedded in coherent profit strategies in order to be effective in enhancing growth of the economies. Thus, innovation depends upon the generation of feasible new capabilities, the operation of which adds new value to the existing circular stream of income and thereby creates new profit and higher income (Hoffman et al, 1998; Goedhuys, Nobert& Pierre, 2008). Accordingly, there is economic growth in developing new ideas, new production process or for finding new market.

Firms engage in a variety of activities to reduce costs, improve output quality and develop new products and market (Goedhuys et al. 2008). These activities are innovative since they incorporate a strong component of technological learning and may result in products and production processes that are new to the firm. Therefore, innovation in the agriculture sector is fundamental in enhancing growth of Kenyan economy.

Endogenous Growth Theory

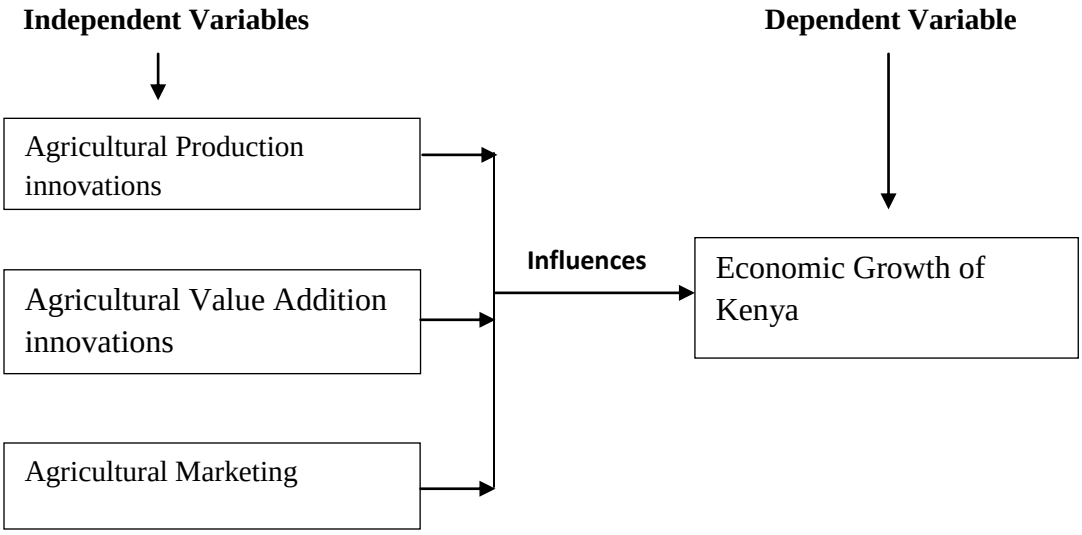
Recognizing that investment in knowledge and innovation is a driver of sustained long-term growth, developed economies have witnessed an increase in the volume of research and

development with a focus on speeding up the development of new products and new processes (Earle & Anderson 2000). In the Agriculture sector innovation is driven by trends in consumer demand for food products with emphasis on variety, quality, nutrition, convenience, safety, reasonable cost and environmental soundness (Barbosa-Cánovas & Gould 2000). Food companies naturally respond to such trends and increase their research efforts as part of this response and seek to gain a sustainable competitive advantage over other companies by exploiting new technologies and innovations (Traill & Meulenberg 2002, Lagnevik et al. 2003).

The endogenous growth theory holds that a steady economic growth rate of output per worker is proportional to population growth: technological progress requires sustained population growthand countries with faster population growth grows faster.The economic growth rate does not depend on the fraction of laboremployed in the production of knowledge. Production of knowledge rises more than proportionally with the existing stock. This implies that Growth accelerates over time and the economy never converges to a balancedgrowth path.Therefore, Production of knowledge is self-reinforcing: each new discovery encouragesfurther technological progress: growth is continuously increasing so that output reaches infinity over infinite amount of time. The model's implications crucially depend on whether the economy displays constant, increasing or decreasing returns in the produced factors of production. The model displays endogenous growth; the steady-state growth rate of output per worker is proportional to population growth.

Conceptual Framework

The conceptual framework outlines the various variables under study and their relation to economic growth. These are innovations in agricultural production practices, agricultural value addition practices and agricultural marketing techniques in relation to economic growth.



Agricultural Production Innovations

According to RoK (2010), agricultural sector ministries are expected to ensure that farmers, producers, processors and marketers of agricultural produce employ the most contemporary methods and technologies. Roling (2009) observed that this will ensure that all agricultural enterprises will be highly productive, commercial in nature and competitive at all levels. The agriculture sector development strategy 2010-2020 also underscores the need to develop and prudently manage factors of production such as land, water, inputs, and financial resources so that the cost of production is kept within international standards (RoK, 2010). A public-private partnership between agricultural input suppliers and the Kenyan government through the Kenya Horticulture DevelopmentProgram (KHDP) in Western Kenya successfully implementeda greenhouse tomato farming program to address the issues of seasonality and input intensity, improve marketing and production, and increase smallholder incomes (Odame, Musyoka, and Kere, 2008). It was observed that the KHDP initiative promoted a shift to a less labor-intensive, more cost-effective, and more environmentally sustainable method of farming that avoids crop

protection chemicals. Odame et al. (2008) recommends that if this method is adopted on a larger scale in other sectors, it could lead to substantial leaps in production, output, and incomes.

The scale of operation determines innovation potential as illustrated by endogenous growth theory. Economists suggest that relative factor prices, particularly labor versus capital costs, and the technical underpinnings of economies of scale determine the choice of scale (World Bank, 2007). However, in the context of agriculture in Kenya, where production costs are high, scale economies can be quickly counterbalanced by the costs of ensuring adequate stocks for processing but it's a common challenge in seasonal and predominantly rainfed agricultural systems(Kimani, 2003). Thus, scale economies, especially in horticulture, dairy, and livestock products, must be matched by reverse coordination through the value chain, reinforced through maintenance of product quality (Minot & Roy, 2008).

Coordination usually involves some type of farmer organization in land-scarce economies and may involve contracts with large-scale production units in land-extensive economies, often reinforced by vertical integration (Ndii & Byerlee, 2004). The market conditions, especially in the European Union, have influenced a shift, particularly in export crops and products (for example, vegetables and fish), to more integrated value chains represented by larger integrated exporters despite the trend toward smallholder contracting (Temu & Nyankomo, 2007). Temu and Nyankomo study further established that large-scale companies with strong links to end markets and producers through contractual agreements and ownership improved supply management through efficient information sharing within the integrated value chain that eliminates costly demand shortages or oversupply. Odameet al (2008) , in a study on effects of national public policies on agribusiness innovation, found out that significant innovation can match appropriate processing scale with ways to maintain quality and ensure adequate raw material supplies at a reasonable cost hence improving the living standards of citizens.

Nierenberg (2010) notes that, the use of organic manure (an innovative practice) in tea estates has helped to restore soil nutrient and moisture and increased tea harvest by 15-20% while the use of the same innovative practice by rice farmers in Mwea has increased the rice yield by 47%.

The market liberalization in Kenya has decreased the retail-marketing margin for agricultural produce; at the same time, consumers gain from competition and innovation in product

distribution. With the development of a warehouse receipt systeminitiative by NCPB, innovation in the agricultural marketing system will potentially match innovation in processing, with potential spillover into production technology and quality standards. Informal markets will continue to serve individual farmers with small surpluses and rural consumers. As innovation theory and examples of failed technologies suggest, SSA does not need the best technology, but rather the most appropriate technology that best fits with local conditions(Elliot 2008). Moreover, Kenya has restructured the Agriculture Finance Corporation(AFC), a government-owned financial institution that provides credit to the agricultural sector, but with a past track record of high losses (Agriconsortium, 2010). Not only did the AFC broaden its loan portfolio to include seasonal crop credit, but it also enhanced product delivery through process automation to support entrepreneurial activities in agricultural sector. These new roles have been acknowledged by Agriculture Sector Development Strategy 2010-2020 as the main driver of the strategy (RoK, 2012).

Agricultural Value addition innovations

The MSEs in this sector engage in very little on-farm and off-farm processing of their agricultural produce resulting in 91% of all the agricultural exports being in raw or semi processed form (Muteti, 2010). Innovative practices in the Agriculture sector such as agro-processing and others will improve rural incomes by adding value to the produce; save on transport costs by delivering high-value/low-volume products and create opportunities for use of by-products as inputs in other farm operations such as animal feeds, manure and fuel (Babu, Abdulahi,& Abubakar ,2010). Secondly, innovative practices in the Agriculture sector will also provide opportunities for reducing farm losses through conversion of perishable commodities into more durable products (Ngee, 2007). Finally, the practices will help to create jobs in the rural areas thereby contributing to poverty reduction as well as reduction of rural-urban migration (Subrahamanya, Mathirajan & Krishnaswamy, 2010). Still, the Kenyan tomato industry and other SSA horticultural sectors require additional investment to serve export and high-end local markets, while competing with cheaper imports (Odame, Musyoka, and Kere 2008). Agricultural products, like horticulture and livestock, have high income elasticity (Murithi, 2009). Karanja (2003) notes that increased demandfor dairy products, in Kenya, from

increased urban population and income has been a force behind increased innovation and production which has led to increased returns in the sector.Milk processing plants primarily coordinate within the market chain, but cooperatives increasingly are creating links between farmers and input suppliers and engaging in value addition higher up the value chain. International NGO that specialize in dairy development in Bomet District have aided cooperatives, but their role is more to facilitate the organization of farmers, to ensure access of farmers to appropriate productivity-enhancing techniques, and to expand the number of smallholders who can participate in the dairy value chain (Sanginga, Water-Bayers, Kaaria, Njuki & Wettasihna, 2009). However, with a healthy private sector following effective market liberalization, the public sector can withdraw to a more regulatory role such as the Kenyan government's creation of the Kenya Dairy Board (NALEP, 1999). The KDB has partnered with private laboratories (Ana-labs) to provide a diagnostics for milk quality, although the pricing of milk by grades has not yet developed(Odame, Musyoka, and Kere 2008).

Compared to staple foods and cash crops, the dairy subsector suggests a pattern of more evolutionary innovation at various points across the value chain, but without the requirement of coordinated innovation throughout the value chain (Odame et al, 2008). Incremental change is a response to high investment costs for smallholder participation in the market and the critical production density needed to justify private sector investment in collection points and cooling stations(Odame et al, 2008). World Bank report (2012) indicates that farmers and commercial producers benefit from diversification into higher value, knowledge-demanding, and innovative products in formal international and domestic markets. A greater demand for a skilled and educated workforce may reduce poverty as a consequence. Countries in Sub Sahara Africa(SSA) therefore have aimed to liberalization reforms in the agricultural sector, to integrate smallholders into the formal market economy, to attract investment specifically in processing industries, and to add scale that increases value addition (Rajalahti, Janssen & Pehu, 2008).Rajalahti, Janssen & Pehu (2007) established that agro-processing assumes a key role to coordinating the supply, bulking, and marketing of agricultural commodities, and as such leads to organizational and technical innovations. An example from the dairy subsector is the processing businesses that, assisted by NGOs or the government, provide credit to farmers, organize stable supplies of raw

products from farmers, and work out contracts with transporters to overcome the distance challenges (Sanginga, Water-Bayers, Kaaria, Njuki & Wettasihna, 2009).

Policies on value addition enabled milling and processing firms such asPembe and Corn Products Ltd. to add value to the raw materials throughprocessing into various products should be supported. Among the most pertinent policies arethe Strategy for revitalizing agriculture, which stresses the promotion ofagro-processing and rural industries; the investment policy and investmentcode, which facilitates the development of agro-processing; and nationalfood and nutrition policy, in which food fortification enhances value additionof basic products, for example, maize products (RoK, 2010). A study by Muli, Saha, Mzingirwa & Lewa (2006) found that maize milling in Kenya offers an example of a dual processing structure, where small hammer mills serve rural communities and small towns and large mills provide higher quality flour to urban markets, thus reinforcing the informal and formal marketing systems. It was also established by Odame, Kangai & Spielman, (2012) that the formal market trade at the assembly and transport levels is attempting to enforce grades and standards for maize within the supply chain through the use of moisture meters that ensure storability and reduce fungal attack. However, Muli et al., (2006) argued that control over grades must usually extend back to the farm level, and sufficient price differentials are necessary to motivate farmers' compliance. This was also recommended by Odame et al., (2008) that a warehouse receipt system with incentives for higher grades of maize, as well as farmer organization and quality-assurance training, allows maize smallholders to participate in the formal markets which improves economic performance at macro levels.

Agricultural Marketing Innovations

Government and public policy play an important role in increasing quality standards development and enforcement demanded by the export market, as well as increasing local supermarket consumers (Mutuku, Kavoi & Tschirley, 2004)). Although the Kenyan government disengaged from overall coordination in agriculture after market liberalization, it remained involved with developing regulations and standards (Wagacha, 2006). The value chain for dairy is relatively complex, since it accounts for the health, quality, and perishability of milk, its

seasonality, and the logistics of daily assembly and bulking within a "cool" chain. These aspects apply to formal marketing channels. However, distance, as in Tanzania, can inhibit producers of raw milk from reaching markets, and cooling and collection facilities are not always close to the sites of production.The informal and formal marketing structure for dairy products is a natural function of the high costs of distance in SSA, but it is also influenced by organizational responses to the distances. Expanding farmer access to formal marketing channels depends on innovative responses to distances and maintenance of the cool chain. Large-scale dairy companies in Tanzania have overcome bottlenecks in the value chain, such as the transport to the cooling facilities, by carrying out and coordinating all aspects of the value chain themselves (Mpagalile, 2008).

Supply chain management is more efficient where information shared within the integrated value chain eliminates costly demand shortages or oversupply. Rural consumption, however, will continue to rely on the informal, raw market, and the urban poor will be better served by peri-urban production. Dairy expansion in Kenya and Rwanda differs from the Tanzanian example. In Kenya and Rwanda, growth in formal marketing of milk relies principally on smallholder production, and bulking in regions with sufficient production density (Karanja, 2003). Odame et al., (2012) notes that higher production in turn justifies the investment in a cooling center, before delivering milk to a larger processing plant, usually located relatively close to the end market. Mpagalile (2008) found out that organizational innovations to reduce transaction costs and maintain quality control were particularly important in achieving greater efficiencies in the value chain. It was also noted in the Bomet study by Sanginga (2009) that farmers who were unable to deliver milk to distant processor collection centers and lacked sufficient economies of scale created cooperatives to collect at central locations, deliver, and sell milk on their behalf. The cooperatives, especially in Kenya, have a vertically integrated value chain and added value is felt higher up the value chain through processing and creating new products such as yogurt (Odame, Musyoka, and Kere 2008).

The spread of supermarkets beyond urban areas shortens distances for transporting perishable products, provides new outlets for products, and triggers innovations in product development, packaging, and batch numbering in cottage industries (Odame, et al., 2008).The Kenyan dairy

sector illustrates how innovative access to finance and credit can spur private sector expansion and more integrated and efficient value chains. Some examples are e-dairy, and village banks that extend services to rural areas, contractual agreements with dairy processors that recover credit given to dairy farmers, and the easing of collateral requirement (Odame et al, 2008). Innovations that ease farmers' access to finance have resulted in increased private sector investment, and consequently in increased dairy production and more efficient value chains.

A major issue in the informal market, particularly in Kenyan Diary farming, as indicated in Agriculture Sector Development Strategy 2010-2020 is whether rural areas can be integrated into more formal market structures (RoK, 2010).Where the costs of bulking are too large to justify integration into the formal market, it might be possible to incorporate cottage industries for butter and cheese for dairy products in rural areas (NALEP, 2009). Pilot integration attempts in northern Kenya have yet to reach a scale that would invite private sector investment in quality improvement, marketing, and packaging (World Bank, 2012). Over time, the question of integrating all dairy producers into the formal marketing system depends on further investments in transport infrastructure and further refinement of grades and standards. Eventually as indicated in World Bank (2007) report that price incentives rather than government regulations can drive quality maintenance throughout the value chain.

Research Methodology

To meet the research objectives the study employed desktop research. This involved reviewing relevant research texts, scientific journals, websites, agricultural publications and magazines. These were critically analyzed and put down in the findings.

Summary Findings

Introduction

This chapter provides a summary of the findings of the research, the conclusions and recommendations of the study. The findings are catecorized into innovations along the agricultural value chain namely production, value addition and marketing innovations.

Agricultural Production Innovations

The study determined that the Agriculture sector is largely dominated by micro and small enterprises (MSEs) accounting for 80% that have low levels of innovation occasioned by low

adoption of improved technologies leading to low productivity (Kipkurui, 2009).These MSEs are also characterized by over reliance on labor intensive and low productivity technologies as well as over-reliance on rain fed agriculture and minimal irrigation use (Abiola, 2008). The sector also lacks dominant enterprises and farming systems, a fact which complicates adoption of innovations in the sector (Wanjohi & Mugure 2008).The study however found that productivity is improved with enterprises earning more as depicted in the public-private partnership between agricultural input suppliers and the Kenyan government through the Kenya Horticulture Development Program (KHDP) in Western Kenya.The greenhouseinnovation in tomato farming to addressed issues of seasonality and input intensity, improved marketing and production, and increased smallholder incomes (Odame, Musyoka, and Kere, 2008). It was observed that the KHDP initiative promoted a shift to a less labor-intensive, more cost-effective, and more environmentally sustainable method of farming that avoids crop protection chemicals. Odame et al. (2008)further recommended that if this method is adopted on a larger scale in other sectors, it could lead to substantial leaps in production, output, and incomes.

The study also determined that coordination of farmer organization in land-scarce economies and contracts farming with large-scale production units in land-extensive economies, reinforced by vertical integration improved production and eliminated costlydemand shortages or oversupply (Ndii & Byerlee, 2004;Temu & Nyankomo, 2007). Nierenberg (2010) notes that, the use of organic manure (an innovative practice) in tea estates has helped to restore soil nutrient and moisture and increased tea harvest by 15-20% while the use of the same innovative practice by rice farmers in Mwea has increased the rice yield by 47%.

The study found that with the development of a warehouse receipt system initiative by NCPB, it was determined that innovations in the agricultural marketing system potentially match innovation in processing, with potential spillover into production technology and quality standards. The study also found that SSA does not need the best technology, but rather the most appropriate technology that best fits with local conditions (Elliot 2008).

Agricultural Value Addition Innovations

The study determined that the MSEs in agricultural sector engage in very little on-farm and off-farm processing of their agricultural produce resulting in 91% of all the agricultural exports being in raw or semi processed form (Muteti, 2010). Innovative practices in the Agriculture sector such as agro-processing and others,improves rural incomes by adding value to the produce; save on transport costs by delivering high-value/low-volume products and create opportunities for use of by-products as inputs in other farm operations such as animal feeds, manure and fuel (Babu, Abdulahi,& Abubakar ,2010). Secondly, innovative practices in the Agriculture sector provide opportunities for reducing farm losses through conversion of perishable commodities into more durable products (Ngee, 2007). Finally, the practices help to create jobs in the rural areas thereby contributing to poverty reduction as well as reduction of rural-urban migration (Subrahamanya, Mathirajan & Krishnaswamy, 2010). The benefits of agricultural value additions has been captured by Karanja (2003) who noted that increased demand for dairy products, in Kenya, from increased urban population and income has been a force behind increased innovation and production which has led to increased returns in the sector. Sanginga, Water-Bayers, Kaaria, Njuki & Wettasihna, 2009 also noted that access of farmers to appropriate productivity-enhancing techniques, expand the number of smallholders who can participate in the dairy value chain hence more income and general improvement of standards of living to the community.

Agricultural Marketing Innovations

The study noted that although the Kenyan government disengaged from overall coordination in agriculture marketing after market liberalization, it remained involved with developing regulations and standards (Wagacha, 2006). The public sector can withdraw to a more regulatory role such as the Kenyan government's creation of the Kenya Dairy Board following effective market liberalization, (NALEP, 1999). The study found that expanding farmer access to formal marketing channels depends on innovative responses to distances and maintenance of the cold chain in perishable agricultural products sector. For instance, in Tanzanialarge-scale dairy companies have overcome bottlenecks in the value chain, such as the transport to the cooling facilities, by carrying out and coordinating all aspects of the value chain themselves (Mpagalile, 2008).Supply chain management is more efficient where information shared within the integrated value chain eliminates costly demand shortages or oversupply. In Kenya and Rwanda,

growth in formal marketing of milk relies principally on smallholder production, and bulking in regions with sufficient production density (Karanja, 2003). Odame et al., (2012) noted that higher production in turn justifies the investment in a cooling center, before delivering milk to a larger processing plant, usually located relatively close to the end market. Mpagalile (2008) found out that organizational innovations to reduce transaction costs and maintain quality control were particularly important in achieving greater efficiencies in the value chain. It was also noted in the Bomet study by Sanginga (2009) that farmers who were unable to deliver milk to distant processor collection centers and lacked sufficient economies of scale, created cooperatives to collect at central locations, deliver, and sell milk on their behalf. The cooperatives, especially in Kenya, have a vertically integrated value chain and added value is felt higher up the value chain through processing and creating new products such as yogurt (Odame, Musyoka, and Kere 2008).

The study noted that spread of supermarkets beyond urban areas shortens distances for transporting perishable products, provides new outlets for products, and triggers innovations in product development, packaging, and batch numbering in cottage industries (Odame, et al., 2008). The Kenyan dairy sector illustrates how innovative access to finance and credit can spur private sector expansion and more integrated and efficient value chains. Some examples are e-dairy, and village banks that extend services to rural areas, contractual agreements with dairy processors that recover credit given to dairy farmers, and the easing of collateral requirement (Odame, Musyoka, and Kere 2008). Innovations that ease farmers' access to finance have resulted in increased private sector investment, and consequently in increased dairy production and more efficient value chains.

Conclusion and Recommendations

Kenyan economic growth prospect highly depends on the performance of agricultural sector. Stagnation in agricultural growth rate affects the realization of development plans and development of rural economy where many people still depend on agriculture for their livelihoods. The private sector has successfully taken over many producer markets because of their higher profit margins, their greater integration into export and retail markets. Government

programmes to promote development of innovative agricultural activities has borne fruits in areas analyzed by the study. The country studies point to the considerable challenge for the private sector in successfully taking over producer market chains for staple food during the early stages of agricultural development through partnership and contractual agreements to eliminate costly demand shortages and oversupply.

Innovative practices in the agriculture sector such as agro-processing and others have been identified to improve rural incomes by adding value to the produce; save on transport costs by delivering high-value/low-volume products and create opportunities for use of by-products as inputs in other farm operations. The practice has helped to create jobs in the rural areas thereby contributing to poverty reduction as well as reduction of rural-urban migration. It is clear from the literature review that access to new markets can drive innovation. This study also established that where supply chain management is more efficient, market information is shared amongst entrepreneurs and market access is improved.

Innovation characterized entrepreneurship can brings about technical progress through capital-saving, efficient production techniques and higher level of output for economic growth. The Kenyan dairy sector illustrates how innovative access to finance and credit can spur private sector expansion and more integrated and efficient value chains.The entrepreneur can create and supply new line of consumption to enhance growth in some emphasized entrepreneurial sectors to stimulate growth in various enterprises and industrial organizations. However, Kenyan agriculture sector entrepreneurs still face problems and challenges in their struggle for innovation and technical progress.

Recommendations

1. In the quest to innovate, agribusiness firms engage in networks and create links. However, such links are still weak and need to be strengthened through networking and collaborative research and dissemination of results into the communities. Private-public partnership policies, especially through business and collective associations, have proved adequate in addressing agricultural innovation challenges. Therefore, the study recommends a policy

framework to encourage private participation in agricultural production activities. Public-private partnerships must be strengthened and extended beyond the traditional field of research and development (R&D). As the country studies suggest, the traditional view of public-private partnerships focusing mainly on R&D should be replaced by a broader notion of Public-private partnerships that extends to advisory, extension, and other support services.

2. Innovative practices in the agriculture sector such as agro-processing and others have been identified to improve rural incomes by adding value to the produce; save on transport costs by delivering high-value/low-volume products and create opportunities for use of by-products as inputs in other farm operations. The practice has helped to create jobs in the rural areas thereby contributing to poverty reduction as well as reduction of rural-urban migration. It is therefore recommended that a national agribusiness policy hinged on technology and knowledge dissemination be established. Through this policy, agribusinesses and farmers will be able to access information on new product development and to improve their production systems and the quality of production. While the underlying philosophy of such policies should remain, government needs to enhance the incentives for local firms to be more innovative and competitive. Public policies can address inhibitors of innovation through funding schemes devoted primarily to innovation, such as new products, adaptation of machinery and equipment, and improvement in processes.

3. Markets are the most important drivers, as they create incentives to innovate.These policy elements indirectly influence innovation through the operational environment of value chain actors and their attributes. In general, the successes and failures in the country studies point to a number of different investment and policy priorities on marketing programmes.The study recommends that market liberalization reforms should be continued so to integrate small scale farmers into the formal economy to attract investments opportunities from processing industries. This will include greater investment in core research and transportation infrastructure, in institutional development, and in farmer organizations; more consistent and complete liberalization, especially in service delivery and seed markets; improved access to credit, especially in rural finance; and intervention and support to overcome coordination failures and kick-start of nascent markets.

Areas for Further Studies

In conclusion we note that given that this was desk study, it would be useful to conduct additional studies to confirm these initial insights and to further the understanding of the contribution of agricultural innovation practices in growth of national economy. An area for further inquiry would be on how public-private partnership in agriculture influences innovation in dynamic innovation networks and explore the extent to which they contribute to economic development, as noted by other scholars. These points indicate research gaps on more process-oriented studies on the contribution of innovation in agriculture to economic development.

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