Impact of Economic Regimes on Food Systems in Kenya

By Tabitha Kiriti Nganga and Mercy G. Mugo
Supervised by Elisabeth Bürgi Bonanomi and Boniface P. Kiteme

Publisher:
Centre for Development and Environment (CDE), University of Bern
Mittelstrasse 43, CH-3012 Bern, Switzerland
www.cde.unibe.ch

Funding:
The project "Towards food sustainability: Reshaping the coexistence of different food systems in South America and Africa" is part of the Swiss Programme for Research on Global Issues for Development (r4d programme). As such, it is funded by the Swiss Agency for Development and Cooperation and the Swiss National Science Foundation [Grant number 400540_152033], with additional support from the Centre for Development and Environment (CDE), University of Bern, Switzerland.

Research consortium:
Comunidad Pluricultural Andino-Amazonica para la Sustentabilidad (COMPAS), Cochabamba, Bolivia; Centre for Training and Integrated Research in Arid and Semiarid Lands Development (CETRAD), Nanyuki, Kenya; Geneva Academy of International Humanitarian Law and Human Rights, Geneva, Switzerland; as well as Centre for Development and Environment (CDE), Institute of Geography, and Institute of Social Anthropology, all at the University of Bern, Switzerland.

Citation:
Kiriti Nganga T, Mugo MG. 2018. *Impact of Economic Regimes on Food Systems in Kenya.* Study supervised by E. Bürgi Bonanomi and B. P. Kiteme. Towards Food Sustainability Working Paper No. 7. Bern, Switzerland: Centre for Development and Environment (CDE), University of Bern.

DOI: https://doi.org/10.7892/boris.119466

Authors: Prof. Tabitha Kiriti Nganga, School of Economics, University of Nairobi, Kenya; Dr. Mercy G. Mugo, School of Economics, University of Nairobi, Nairobi, Kenya

Supervisors: Dr. Elisabeth Bürgi Bonanomi, Centre for Development and Environment (CDE), University of Bern, Switzerland; Dr. Boniface P. Kiteme, Centre for Training and Integrated Research for ASAL Development (CETRAD), Nanyuki, Kenya

Layout: Simone Kummer, CDE

Cover photo: Empty crates ready to be filled with mangoes for export (by Johanna Jacobi)

Swiss Programme for Research on Global Issues for Development

The Swiss Programme for Research on Global Issues for Development (r4d programme) is a joint funding initiative by the Swiss Agency for Development and Cooperation (SDC) and the Swiss National Science Foundation (SNSF). The r4d programme supports research aimed at solving global problems with a focus on least developed as well as low- and middle-income countries. The r4d programme consists of five thematic modules and a thematically open module.

www.r4d.ch

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

FNSNF
Swiss National Science Foundation

Contents

List of Figures

List of Tables

Acknowledgements

We acknowledge the technical and financial support received from the Centre for Training and integrated Research in ASAL Development (CETRAD) to undertake a study impact of economic regimes on food systems in Kenya.

Special gratitude to Dr. Boniface Kiteme Director CETRAD, and Coordinator of Sustainable Governance of Food Systems Project, Kenya; Dr. Elisabeth Bürgi Bonanomi, Senior Researcher and Lecturer, Centre for Development and Environment (CDE) and World Trade Institute (WTI) of the University of Bern for her invaluable comments both written and during the monthly Skype meetings.

We highly appreciate the knowledge, insights and interactions with the project team gained during one of the CETRAD meetings held at the Green Hills Hotel in Nyeri in March 2017.

Special thanks to Mr James Murunga, our research assistant who helped in quality data collection and entry under difficult circumstances.

We appreciate the contributions from all participants and stakeholders who made the exercise successful. To all those who have not been mentioned individually, we sincerely thank you for your time and input in the process.

Prof. Tabitha Kiriti Nganga - Lead Consultant
Dr. Mercy Mugo - Consultant

Executive Summary

This study sought to investigate the prevailing trade conditions in order to understand the extent to which the current food systems have been shaped by Kenya's trade policy and the extent to which Kenya's trade policy is embedded in or restricted by international commitments. It also sought to analyze Kenya's agricultural policy in order to understand the extent to which the Kenya Government is involved in the food processing industry. The study also analyzed Kenya's food standards and labeling policy and investigated the intellectual property rights with regards to seeds and other inputs in Kenya.

The study has used mainly desk search literature search and review. The document review was complemented with interviews with key stakeholders. There was also intensive engagements, interactive discussions and exchange/sharing of the information gathered with other researchers including monthly skypes with Elisabeth Bürgi).

The first objective was addressed by analyzing Kenya's trade policy which has evolved from an import substitution phase that was protectionist before and after independence up to the late 70 and early 80s. In 1984, Kenya adopted trade liberalisation, starting with the World Bank and IMF's Structural Adjustment Programs (SAPs). This championed privatisation that led to limitation of the role of the State in the economy, especially price and input controls and trade in agricultural produce. This led to a focus on production for export, with cash crops prioritised over production of food for domestic consumption, with detrimental impact on national food security. The SAPs phase was followed by an export promotion phase where liberalization and production for export was emphasised. Trade liberalisation continued with Kenya joining the World Trade Organization (WTO) in 1995 and joining WTO's Agreement on Agriculture (AoA). The Vision 2030 phase continued the export promotion emphasis but with subsidies in agricultural inputs especially fertilizer. A number of agricultural policies and strategies were introduced such as the Economic Recovery Strategy (ERS), the Agricultural Sector Development Strategy (ASDS) and Strategy for Revitalizing Agriculture (SRA) in order to increase agricultural production and more so to make Kenya food secure.

However, even with these policies and strategies, Kenya remains a net food importer especially maize and wheat and the value of Kenya's exports is much lower than that of its imports hence operating trade deficits in these products. On the other hand, Kenya has been operating a trade surplus in vegetables and beef. It is important to note that beef and vegetables are mainly produced by large scale farmers while maize is mainly produced by small scale farmers. Wheat is also produced by large scale farmers but a few small scale farmers also try to produce some for household consumption. Kenya has signed various trade agreements which are either multilateral or bilateral and belongs to various regional trade blocks such as East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA), and to the Tripartite Agreement between the three regional trading blocs of EAC, COMESA and Southern African Development Community (SADC). It also belongs to Intergovernmental Authority on Development (IGAD) and already signed the Economic Partnership Agreements (EPAs) and has trading arrangements with Organization for Economic Co-operation and Development (OECD) and America Growth and Opportunities Act (AGOA).

The study found that the multilateral trading agreements and especially the AoA has not substantively increased market access for Kenya in developed countries especially to the OECD as might have been expected due to high non-tariff barriers that have been maintained by these States although it has opened up Kenya's food market to cheap subsidised food products from developed states, with detrimental impact on agricultural production by smallholder farmers who are unable to compete due to the

distorted market. Declining production means declining income and opportunities of employment for the most food insecure – smallholder farmers and farm labourers – with the effect that food poverty, general poverty and inequality has increased as a result of liberalization in trade in agricultural produce. This means therefore, that even as Kenya maintains its commitment to trade liberalization, it should do so with caution taking into consideration the rights of the citizens and that is why when circumstances dictate that import tariffs should be removed to address issues of food security, the Kenya Government has not been hesitant to do this in order to protect the right to food for all citizens. Kenya has also been using fertilizer subsidies to help the small scale farmers increase food production. Price subsidies on essentials such as maize flour, social protection schemes for the poor and vulnerable in the form of food subsidies, monthly stipends, 30% public procurement preference and reservation for women, youth and persons living with disabilities are all meant to make sure that even as Kenya adopts trade liberalization, the fundamental rights of citizens on the right to food are not overlooked.

The second objective analysed Kenya's agricultural policy and government involvement in the agricultural sector and noted that the agricultural sector plays a key role in the food system in production, processing and consumption which have important implications on food security and its sustainability. The government has been involved in sourcing and processing of maize, wheat, dairy, beef and vegetables, commodities that represent three food systems namely; local (maize), national (wheat, beef and dairy) and international (vegetables).

The agricultural policy in the post-independence (1963-1980s) was implemented by direct government intervention with the objective of achieving food self-sufficiency. Most of production and marketing parastatals were under government control which involved providing subsidies on fertilizers and artificial insemination (AI) and setting of grain prices and controlling the distribution of agricultural inputs. The government also set farm-gate and consumer prices for all basic agricultural commodities and also engaged in investments in productive infrastructure such as irrigation schemes. However, the sector was characterized by inefficiencies, poor institutional management dismal performance.

During the liberalization period (mid 1980s- mid 1990s) the government withdrew from pricing and provision of input subsidies and marketing services and allowed for food imports. This had adverse effects on employment, incomes and food security, especially for smallholder farmers.

The post-liberalization period (2000-current) continued with liberalization while protecting farmers through policy stance such as National Food Policy (NFP), Economic Recovery Strategy (ERS), Vision 2030, Strategy for Revitalizing Agriculture (SRA) and Agricultural Sector Development Strategy (ASDS). These policies afforded agriculture high prominence, priority and support, recognizing its role in economic growth in the post liberalization era. They also sought to raise household incomes, create employment and ensure food and nutrition security through creation of favourable institutional operation environment and revival of nearly collapsed agricultural institutions such as Kenya Meat Commission (KMC), Kenya Cooperative Creameries (KCC), Kenya Seed Company (KSC), Agricultural Finance Corporation (AFC) and Agricultural Development Corporation (ADC). These policies led to positive growth in agriculture, reduction of food insecurity and poverty, and increase in productivity of key commodities during the 2003-2007 period.

Government involvement since independence (1963) to date in sourcing and processing of the assessed products varies, with substantial involvement in crops like maize and wheat to minimal involvement in horticultural crops like vegetables. The involvement in the agricultural sector has been largely in form of providing the policy guidance and providing conducive legal and regulatory environment for

development of flagship projects and programs for the agricultural and livestock sector. These projects are evident of government involvement in supporting production, processing and marketing of agricultural produce (Appendix A1). The government has a role of promoting domestic production and protecting farmers, while restricting imports through import tariffs and export bans to safeguard food self-sufficiency.

Government involvement especially in terms of policy, legal, regulatory environment and institutional support by way of flagship projects and programs appears to be similar between wheat and maize since these two are very important commodities in Kenya from a food security view point due to changing food preferences and socioeconomic changes associated with urbanization. With growing population, urbanization and rising prices of wheat and maize processed products, the food security situation especially for the urban poor is potentially compromised. Kenya has traditionally protected domestic wheat producers with a 25% to 35% tariff, although COMESA and EAC agreed to a process to vary these rates as circumstances require.

Kenya is one of the largest producers and consumers of dairy products in Africa and the sector is largely based on smallholder production. The dairy processing industry in Kenya is dominated by a few big processors and a high number of smaller and medium operators. However, despite the various national and agricultural sector specific policies in place post-liberalization, there appears to be weak government institutional mechanisms to support the dairy industry. For decades, government policy on the dairy industry focused on promoting milk production with limited emphasis on processing, marketing and consumption. Government institutions have focused more on setting standards, regulations and policy, while the private sector has focused more on production, processing and marketing. The existing institutional and regulatory frameworks in the sector amount to a multiplicity of actors with multiple roles, requiring rationalization and coordination for the growth of the sector and specifically benefit the smallholder producer. The dairy sector is crucial for economic development, poverty alleviation, food and nutritional security and increased household incomes. Kenya is self-sufficient in milk and milk products and even exports some dairy products to the region but the government needs to address the apparent bias in favor of large scale producers at the expense of small holder ones.

The processing and marketing logistics of beef were controlled through a parastatal monopoly, Kenya Meat Commission (KMC) until liberalization in the late 1990s and post-2002 economic revitalization policies. The collapse and eventual revival of KMC saw export of beef and beef products increase after 2006 when policy allowed private players into the beef sector. Currently private companies such as Farmer's Choice command a substantial portion of the value chain (large private companies export up to 90% of their meat products) following liberalization and changing policy environment, with their products being far more prominent compared to public corporation like KMC's. The local terminal markets and meat traders are said to be disorganized with little capacity for value addition which acts as a barrier to entry into high end market and export opportunities. The beef value chain suffers from lack of traceability and control of animal production rendering it vulnerable to disease outbreaks. Kenya is not self-sufficient in meat and caters for the deficit from neighbouring countries, although she exports live cattle mainly to the Middle East.

The Kenyan horticultural sector has largely been private sector driven and quite successful despite not having not had a policy to guide its growth and sustainability prior to the National Horticulture Policy of 2012. Vegetables account for 44.6% of the total value of horticultural produce.Vegetables are produced mainly by smallholder farmers but the trade and value chain in vegetables faces a number of hurdles

such as the seasonality of production, high cost of production, low capacity and high cost of value addition infrastructure resulting in limited processing of the produce, which compromises their competitiveness as well as producers' incomes. However, the government has sought to ameliorate the hurdles along the value chain through policy intervention.

The agricultural sector faces a number of challenges in terms of: farmer support; land use and productivity; infrastructure; commercialization and diversification; value addition for exports and marketing; as well as trade matters in terms of: multiple levies, tariffs and non-tariff barriers. Despite the challenges, the government has tried to adopt agricultural technologies to improve productivity, empower extension officers, encourage agri-business, easing farmers' access to inputs, and a creating partnerships between farmers and agricultural stakeholders. Government policies to promote privatization and commercialization, market-oriented and profitable agriculture are also supported through high levels of public expenditure and policy coherence with agricultural sector policies being adapted to the country´s general policy and political changes with the government providing a regulatory framework to ensure that food security, poverty reduction, employment creation and incomes are not compromised in the process.

The third objective focused on investigating food standards and labelling policies in Kenya. The study found that Kenya follows global, regional and private standards in foods standards in coming up with its own national foods standards.

In Kenya, the Biosafety Act of 2009 whose features include prohibition of anyone dealing with a Genetically Modified Organism (GMOs) (e.g. for research, manufacture, production, commercial release and import) unless licensed by the National Biosafety Authority for contained use or intentional release into the environment and the National Biosafety Authority serves as the National focal point of all Biosafety matters in Kenya. It also exercises supervision and control over the development, transfer, handling and use of GMOs with a view to ensuring and assuring safety of human and animal health and provision of an adequate level of protection of the environment. The regulations in the Act cover activities involving importation into, exportation out of and movement of GMOs through Kenya.

In Kenya, all matters related to marking, labeling, and packaging are governed by the Food, Drugs, and Chemicals Substances Act; the Biosafety Act of 2009; the Biosafety (labeling) Regulations of 2012; the Food Labeling, Additives, and Standard Regulations; and the Weights and Measures Act. All items traded in Kenya are supposed to be labeled with metric measurements, and packaged. It is mandatory that all foodstuffs must be labeled in English or Kiswahili and manufacturers must indicate on the labels of all consumables the date of manufacture and of expiry.

However, the study found that in Kenya food standards and regulations are hardly implemented along local and regional value chains. This is mainly due to: (i) Lack of awareness of consumers including all value chain operators on food safety and quality issues; (ii) Low income among consumers makes them base their purchase decisions on prices and not on food safety and quality; (iii) Limited capacity of the national institutions responsible for controlling compliance to adapt and adopt international or regional standards and enforce national regulations and standards; (iv) Lack of incentives for value chains operators from inputs, through farming, trading and processing up to retailing to invest into good practices and quality assurance systems; and (v) The informal nature of food production and the fact that they are small scale producers who would find it very expensive investing in food standards means that these standards are more applicable to large scale food handlers leaving the consumers who mainly consume products from small scale producers exposed to substandard foods.

Kenya's food standards, like standards for other products, are enforced through the Kenya Bureau of Standards, but this is not as effectively enforced as would be expected for food for domestic consumption. On the other hand standards for agricultural production for export are enforced throughout the value chain due to dangers of loss of markets if produce standards are not met. Food and other products for export are thus of good standards and are adequately labeled due to industry enforcement more than government enforcement.

Even with the government coming up with the labeling and traceability systems, there are certain challenges in implementing traceability and labeling systems in the Kenyan context.

Some of these challenges are: (a) Installing and implementing a traceability system involves costs in terms of technology and software costs, services costs, changes in processes and operating costs. For many small and medium enterprises in Kenya, these costs can be quite significant and become a huge burden to the small scale farmers and enterprises who supply the domestic market with no immediate payback; (b) Most small scale farmers unlike large scale farmers in Kenya that are in the food supply chains lack the capacity and skills to provide the necessary information and training to create traceability documentation and to put in place the requisite systems and processes; (c) Different requirements of different suppliers, and different documentation makes traceability complicated and time consuming for small scale farmers supplying the domestic market; and (d) Record keeping obligations can be excessively difficult for small scale famers to comply with due to high levels of illiteracy. Small scale farmers most often cannot guarantee the provision of traceability or the record keeping on the maintenance of standards which goes with it.

This implies that labeling and traceability systems favor large scale producers and vertically-integrated enterprises and that Kenyan consumers could be consuming GMO products without knowing. There is therefore need for capacity building and sensitization and enforcement on the requirements and importance of label and traceability in order to protect the consumers.

The fourth objective was to analyse the intellectual property rights in the context of seeds and inputs. The study found that Kenya is a signatory to Trade Related Intellectual Property Rights (TRIPS) and has even enacted laws on Intellectual Property (IP) that give seed companies exclusive monopoly over their products and these companies are seen as pro-competitive as each seed is a new product. The laws also grant plant breeders in plant variety exclusive rights to produce reproductive material of the variety for commercial purposes.

The study found that Kenya has formal and informal seed systems. The formal seed system is served by government initiated research programs for some benefactor food and cash crops while the informal seed system comprises farm-saved seed, seeds purchased, multiplied or marketed locally between farmers and, seed accessed through civil society organizations, or imported by unregistered seed dealers, and relief agencies.

The study found that only registered seed traders are allowed to import seed into Kenya and that all seed imported into the country must fulfill International Seed Testing Association (ISTA) requirements in addition to satisfying the relevant phytosanitary measures including laboratory quality tests upon arrival.

Seed certification in Kenya is governed by the Seeds and Plant Varieties Act (Chapter 326 of the Laws of Kenya) and is guided by ISTA rules of seed testing and the Organization of Economic Cooperation

and Development seed certification schemes. The certification process includes field registration, seed crop inspection during active growth, seed processing, seed laboratory testing, labeling and sealing, pest control, and post certification survey.

Kenya is a signatory of the International Union for the Protection of New Varieties of Seeds (UPOV) 1978 system, and therefore the government tests, registers and protects new varieties of plants in accordance with UPOV requirements and regulations in the Seeds and Plant Varieties Act (Cap 326). This ensures protection of plant breeders' rights from unauthorized production or propagation of protected varieties, and unauthorized sale/marketing activity. The government also provides for trademark and brand name registration in Kenya. The Kenya Industrial Property Institute (KIPI) registers products via an application process. Trademarks are registered for ten years initially, but may be renewed indefinitely upon request. The Government of Kenya does not allow imports of genetically modified (GM) seeds for commercial use.

However, the study has found that UPOV and Plant Variety Protection (PVP) systems are exclusively aimed at supporting formal seed systems and ignore the informal farmer led seed system. They also do not allow for the exchange of farm-saved seed of protected varieties through the sales of seed surpluses on the local market, restrict state procurement and the impact on rural livelihoods and biodiversity can be great especially when local food is grown from local, farmer-bred seed.

The UPOV and PVP systems usually benefit the horticultural sector but they hurt food crops as they do not provide a sufficient balance between the exclusive rights of breeders and the rights of farmers to save, exchange and trade protected planting material.

The plant variety protection laws that limit farmers' customary practices of accessing seed, including in emergency situations may have a negative impact on food and nutrition security, sustainability and resilience of farming and food systems. This is because laws can affect different groups of farmers in different ways, depending, for example, on their ability to have cash at the time needed, and the crops they use. It may also impact negatively on their human rights (International Covenant on Economic, Social and Cultural Rights) since plant variety protection laws can interfere to some extent with these seed systems, depending on how far they restrict the farmers' use of seed in the case of protected varieties.

(1) Trade policy to take into account the fundamental rights of Kenyans to Food Security: For Kenya to be food secure, trade laws, policies and agreements must take into account the fundamental rights in Article 43 on the Bill of Rights as enshrined in the Constitution 2010. The State must thus take into account the fundamental rights of the Kenyan people in its adoption of national trade policies as well as in joining international agreements. This will ensure that these policies and agreements do not negatively impact on the fundamental rights of Kenyans, especially their economic and social rights like the right to food, the right to water, human dignity and the need to provide special protection for vulnerable groups such as the food poor smallholder farmers and farm labourers.

(2) Integrated seed sector development: In order to protect Kenyan's human rights as enshrined in the International Covenant on Economic, Social and Cultural Rights, it is important that the Kenya government comes up with ways and means of making sure that the Kenyan farmer does not suffer in the process of implementing the recommendations of the UPOV 1991. This requires using an integrated seed sector development such that the rights of the farmer as well as the right of the plant breeder are protected. That is combing both formal and informal seed and plant breeding.

(3) Unrestricted access to information and the benefits of seed and plant breeding varieties: The intellectual property regimes on seed and plant breeding should be managed in accordance with common responsibility to prevent the unacceptable prioritization of profit for some, over benefit for all implying that there should be policy intervention to ensure that marginalized groups have unrestricted access to information and the benefits of seed and plant breeding varieties produced by applying scientific methods.

(4) Participation in Decision Making: Kenyan producers and consumers should have a right to participate in decision making regarding the scientific methods used in seed and plant breeding in order to avoid introduction of culturally unacceptable products in the seeds or seeds that may contain substances that may be injurious to the health of the citizens as has been alleged in GMO products.

(5) Subsidies: The Kenya government should allow traditional practices of small scale farmers to access protected seed varieties through farmer managed seed systems by ensuring access of protected seed and plant varieties by offering subsidies to small scale poor farmers so that they can buy these varieties at prices that are affordable to them.

(6) Publicly funded breeding initiatives: The Kenya Government should invest heavily in publicly funded breeding initiatives for the benefit of small-scale farmers or certain groups of farmers such as women who are not sufficiently reached by existing private breeding programs. Public breeding programs can team up with international agricultural centers, Non-Governmental Organizations (NGOs), and so on in order to promote transparency and participatory decision making at all stages of the seed and plant breeding programs.

(7) Flexibility in Seed Regulations: Kenya should be flexible with its seed regulations. For example, locally propagated seed material especially for root and tuber crops are usually in short supply in Kenya mainly because it is expensive to transport. So the Kenya government should allow Kenya Plant Health Inspectorate Services (KEPHIS) supported county level oversight for these crops instead of forcing adherence to national seed certification.

(8) Ensure scientific breeding progress is accessible to small-scale farmers: It is important that countries that join UPOV must ensure that scientific breeding progress is accessible to small-scale farmers, particularly vulnerable groups. This implies that the scientific progress reaches the vulnerable groups in practice and ensures that the process of implementation for UPOV Plant Variety Protection laws complies with human rights standards and principles, especially with regard to participation in decision-making. This can be done by allowing traditional practices of small scale farmers to access protected seed varieties through farmer managed seed systems. The governments can also ensure access of protected seed and plant varieties by offering subsidies to small scale poor farmers so that they can buy these varieties at prices that are affordable to them.

1 Background of the Study

1.1 Introduction

CETRAD is a research and training organization established through a bilateral instrument between the governments of Kenya and Switzerland and based in Nanyuki, Kenya. It is in a consortium of leading research scientists and institutions in Switzerland and Bolivia. The Consortium is implementing a research project focusing on Food Sustainability in South America and Africa under the funding of the Swiss Programme for Research on Global Issues for Development (r4d Programme). It is implemented jointly by the Swiss Agency for Development and Cooperation (SDC) and the Swiss National Science Foundation (SNSF). The main objective of the Food Sustainability Project is to provide evidence-based scientific knowledge for the formulation and promotion of innovation strategies and policy options that improve individual and aggregate levels of food systems' sustainability. The emphasis of the project is on finding ways to enhance collaboration within and between coexisting food systems[1]; local, national and international. CETRAD has thus engaged a consultant to investigate this issue.

1.2 Objectives of the Study

The main objective of the assignment is to conduct a study on how economic/trade regimes[2] impact on the food systems under: local food system (maize); national food system (wheat, dairy, beef); and international food system (vegetables). Specifically, the study looks at the prevailing trade regimes. Trade regimes refer to how the government has regulated the economy in respect of trade and how this has impacted food systems; local, national and international. A country's trade regime is shaped by global trade regimes more so the WTO. It also looks at government involvement in the food processing industry in Kenya and the food standard regulations and intellectual property rights.

1.2.1 Specific Objectives

1. To examine the prevailing trade conditions in order to understand the extent to which the current food systems have been shaped by Kenya's trade policy and the extent to which Kenya's trade policy is embedded in or restricted by international commitments. This has involved tracing the history of trade regulation in Kenya since independence; examining trade data of products sold on local, national, international markets; assessing which kind of trade agreements are relevant for Kenya / basic obligations; examining the actual import / export tariffs on the assessed commodities and the actual import / export tariffs on the respective processed products, based on the commodities as mentioned above. The study also investigates any subsidies paid by the government and in which form whether tax levy; promotion; input distribution among others; examines the trade statistics of the main commodities assessed in terms of imports/exports to regional and OECD markets; and the trade flows

[1] A food system is the path that food travels from field to fork. It includes the growing, harvesting, processing, packaging, transporting, marketing, consuming and disposing of food. It also includes the inputs needed and outputs generated at each step (ref: www.futureoffood.ox.ac.uk/what-food-system, accessed on 15-03-17). The food system includes all those activities involving the production, processing, transport and consumption of food. It also includes the governance and economics of food production, its sustainability and the degree to which food is wasted and how food production affects the natural environment (fertilizers and pesticides, SPS issues). It also includes issues of how food affects health and wellbeing including nutrition, obesity and food safety. (e.g. labeling, chemical residues, food handling, etc).

[2] Trade regimes refer to a system of tariff and non-tariff barriers and export incentive schemes aimed at strengthening the competitiveness of local producers [ref: www.bussinessdictionary.com/definition/trade-regime.html accessed 15-03-17]. Trade regimes are shaped by a country's trade policy. A trade regime can be free of restricted/protected. In respect of this study, we focus on trade regimes in relation to food systems in Kenya.

to domestic markets in response to supply and demand. Further the study investigates market access to regional markets by identifying the target markets, and examined access and factors that act as impediments if any. Finally the study also investigated market access to OECD countries by identifying the target markets and examined access and factors that act as impediments to market access. Essentially the discussion in this section revolves around how the market is shaped, challenges and impediments if any and recommendations on how the markets could be shaped otherwise to enhance improvements in food systems and food security sustainability.

2. To analyze Kenya's agricultural policy in order to understand the extent to which the Kenya Government is involved in the food processing industry. This component analyzes Kenya's agricultural policy with respect to the assessed products and sought to answer the following key questions: Does the government support sourcing of domestic products by the processing industry and if so, in which form? Does the government have programs supporting the processing of the respective products and to what extent and in which form? The discussion focuses on what is done and what is lacking.
3. To analyze Kenya's food standards and labelling policy. This component focuses on standards and labelling policies, particularly with a special focus on GMOs among others. This has entailed inquiry on: International commitments such as WTO SPS and TBT Agreements; National Food Standards and in particular those that are relevant; and the reaction of government to international private food standards such as Global Good Agricultural Practices (GAP) in terms of assistance and adaption. The component also investigates whether the government promotes domestic GAPs and assessed what needs to be labelled, what does not and in particular the GMOs and the traceability of respective products. The discussion has been from a food sustainability perspective in terms of what is lacking, what is good and what should be improved.
4. To investigate the intellectual property rights with regards to seeds and other inputs. This component looked at the intellectual property rights in the context of seeds and inputs and explores in detail the history of intellectual property rights; the international commitments related to intellectual property for example, the WTO TRIPS Agreement, the International Union for the Protection of New Varieties of Plants (UPOV) 78 to 91 Agreements. The section also investigates how these international commitments have been implemented in Kenya and the international human rights commitments related to seeds and input rights and examined which rights Kenyan farmers have to propagate or replant seeds. The discussion on this component has been from a food sustainability/human rights perspective in order to understand whether there is there a problem, what needs to be done and what is lacking.

1.3 Methodology and Source of Data

This study has used mainly desk search literature search and review. It has done literature search for material covering trade regimes, government involvement in food processing industry, food standards and labeling policy with special focus on GMOs, and seeds and inputs rights (intellectual property rights). The materials were sourced from the following:

1. Government, government agencies and semi-autonomous government agency policy documents;
2. World Trade Organization documents;
3. World Bank documents;
4. Agriculture, Food and Fisheries Authority documents;
5. Food and Agricultural Organization documents;
6. International Monetary Fund documents;
7. Regional trade integration documents (EAC, COMESA, SADC, OECD, African Union, IGAD, EU-EPA and other related bodies);

8. Published literature covering the four areas of study;
9. Grey literature both published and unpublished;
10. Trade data on exports and imports documents;
11. Export/Imports tariff data documents;
12. Agricultural Policy documents;
13. Kenya Bureau of Standards documents;
14. International/bilateral food standards and labeling policy documents;
15. Kenya Law Reports (for relevant Acts).

To locate these documents, the consultants did an extensive search of the websites of the various organizations in addition to visiting various data bases such as UNCTAD, WTO statistics data base, World Bank, COMTRADE, Google Scholar, HINARI, JSTOR, IMF, Kenya Law Reports and so on. A set of key search terms were developed to facilitate a comprehensive search of the review material.

The documents were then reviewed. The review was organized around the four areas covering the scope of the consultancy which was based on review criteria that was developed around the four TORs. A set of review questions covering each area of the study were developed to guide the reviewing of the documents. Following the review of the documents, the consultants compiled the report by thematic areas.

The document review was complemented with interviews with key stakeholders such as officials in the international trade division in the Ministries of Foreign Affairs and Trade, East African Community, Labour and Social Protection; Industrialization and Trade, Agriculture, KARI, KEPHIS among others.

The consultants also engaged in intensive interaction and extensive discussions and exchange/sharing of the information gathered with other researchers (PhD students, supervisors and heads of this and other Work Packages including monthly skype meetings with Elisabeth Bürgi, lead of WP1. This material was then organized for report writing.

1.4 Organization of the Study

The first chapter of this study presents the background and the objectives of the study, together with the methodology used and data sources. Chapter two analyses Kenya's trade regime from independence to the present. It also assesses the regional trade agreements that Kenya is a signatory to and discusses the various food products produced under the different food systems, amounts sold, exported or imported into the country, the import and export tariffs and trading partners. This is followed by chapter three which focuses on government involvement in food processing industry in Kenya. Chapter four analyses Kenya's food standards and labeling policy followed by chapter five which investigates the intellectual property rights with regards to seeds and other inputs in Kenya. Chapter six provides a summary, conclusions and policy recommendations.

2 Trade Regime and Food Systems in Kenya

2.1 Introduction

Domestic trade comprises of wholesale, retail and informal trade. Kenya's trade policy traces the challenges and weaknesses in each area of trade and presents policy statements regarding their amelioration. The basic idea behind these policy statements is to make Kenya an efficient domestic market and export led globally competitive economy through transformation into a competitive export led economy, enhanced regional integration and widened participation in both domestic and international trade (Republic of Kenya, 2015). For each of the segments of trade, the policies address the challenges and constraints by supporting; a conducive and competitive legal and regulatory framework, providing the necessary infrastructure and environment for ensuring fair trade practices, strengthening personnel and institutional skill capacities as well as collaborations between actors.

International trade whether in goods, services and capital, plays a significant role in Kenya's economic growth and development as evidenced by its contribution to GDP. However, the share of Kenya's exports in total global trade is dismal and stood at 0.03% in 2013 (Republic of Kenya, 2015) suggesting unexploited potential, that could contribute to reduction of the huge balance of trade deficit and strengthening of the currency.

In addition to providing opportunity for agricultural and industrial development through export opportunities for agricultural produce and industrial products, international trade also offers price stability and food security, which are very critical areas of the economy (Republic of Kenya, 2015). Importation of food products in short supply also contributes to stabilization of prices and food security (Republic of Kenya, 2015). However, the emphasis on imports or exports depends on the trade regime prevailing at any particular time.

A trade regime can be either protectionist or liberal. In a protectionist trade regime the government takes deliberate action to protect or rather shield the local industries from the competition created by imported products. On the other hand, a liberal trade regime is one in which the government encourages trade with other countries. Such a trade regime usually uses export promotion strategies and encourages the release of administrative resources in order to encourage trade.

The objective of this chapter is to examine the prevailing trade conditions in Kenya in order to understand the extent to which the current food systems have been shaped by Kenya's trade policy and the extent to which Kenya's trade policy is embedded in or restricted by international commitments. This involves tracing the history of trade regulation in Kenya since independence; examining trade data of products sold on local, national, international markets; assessing which kind of trade agreements are relevant for Kenya / basic obligations; examining the actual import/export tariffs on the assessed commodities and the actual import/export tariffs on the respective processed products, based on the commodities as mentioned above. The chapter also investigates any subsidies paid by the government and in their form whether tax levy; promotion; input distribution among others; examines the trade statistics of the main commodities assessed in terms of imports/exports to regional and OECD markets; and the trade flows to domestic markets in response to supply and demand. Further the chapter investigates market access to regional markets by identifying the target markets, and examined access and factors that act as impediments if any. Finally the chapter investigates market access to OECD countries by identifying the target markets and examined access and factors that act as impediments to market access.

2.2 History of Trade Regulation in Kenya

Kenya's trade policy development has evolved through the following distinct policy orientations: import Substitution Policies (1960s -80s); Trade Liberalization through Structural Adjustment Policies (SAPs) (1980s); Export Oriented Policies 1990s and lately Vision 2030. We start by analyzing the import substitution phase.

2.2.1 Import Substitution Policy Phase

An import substitution policy can be defined as putting various barriers to the importation of foreign goods to reduce a country's foreign dependency and providing these goods by producing them domestically. It is based on the premise that a country should attempt to reduce its foreign dependency through local production of goods, mainly industrial products. The import substitution policy is also termed the infant industry argument in that industries in their infancy should be protected till they grow up and are strong to withstand competition.

Kenya and other African countries implemented import substitution policies after independence with the intention of becoming more self-sufficient and less vulnerable to adverse terms of trade. The import substitution strategy was complemented with state-led economic development through nationalization, subsidization of vital industries and agriculture. Hence this regime was characterized by highly protectionist trade policy. Kenya used this policy by restricting the importation of goods by use of tariffs[3], quotas[4] and controlling the amount of foreign exchange that one could buy from the Central Bank to import goods and subsidizing the industrial sector.

From Independence in 1963 to 1979, Kenya's main economic objective was to protect small industries in order for them to be able to compete in the global market. Hence after independence, Kenya's trade efforts were mainly guided by import substitution following the Sessional Paper No. 10 of 1965 on African Socialism and its Application to Planning in Kenya (Ministry of Economic Planning and Community Affairs, (1965). The paper mainly centered on trade development and pursued enhanced protection of the domestic market to help develop industries. The policy was a key influence on the development of trade regime in Kenya over the first decade from independence. The objectives of the strategy were; rapid growth of trade, easing balance of payment pressure, increased domestic control of the economy and generation of employment. The paper centred on ensuring rapid economic development and social progress for all Kenyans. The policy placed emphasis on promotion and protection of the domestic industries through the use of import substitution strategies meaning that most of what had been previously imported would now be produced in Kenya (Republic of Kenya, 1965).

The Kenya Government established foreign exchange allocation committees to administer foreign exchange quotas for imports for which a limited quota had been established to protect local producers. These committees would only allocate foreign exchange to those who only would import certain goods or industries that would produce goods that would bring in foreign exchange (Ikiara, Nyunya and Odhiambo, 2004).

---

[3] A tariff is form of tax applied as a percentage of the value of the imported item with the tax proceeds going to the government.

[4] A quota gives the maximum quantity of a particular good that can be imported.

Tariffs were used to back up import substitution such that finished goods were charged higher tariffs than capital goods and intermediate goods. However, use of tariffs as an instrument of protection in the long run seemed to fail and so the government turned to quantitative restrictions where import licenses were issued to import certain goods.

In agriculture, the farmers were guaranteed of minimum returns from their investment in agriculture under the Guaranteed Minimum Return Advances Rules of 1977[5]. The amount per acre of any advance made under section 116 of the Act against the guaranteed minimum return in respect of any of the essential crops (maize and wheat) specified in the first column of the Schedule was not to exceed the amount specified in the second column of the Schedule.

The initial impact of the import substitution strategy on economic growth was positive. The gross domestic product (GDP) growth rates averaged 6% in the first decade and about 4% in the second. Part of this growth rate was attributed to an equally impressive growth rate in manufacturing value added, which averaged 8% in the two decades. The impressive growth in manufacturing value added of 11.7% per annum, achieved during the period 1970–75, was not matched in the second decade, when it grew at a much slower 4.9% per annum (Ronge and Nyangito, 2000). During this time, Kenya, for a long period, pursued the goal of attaining self-sufficiency in key food commodities that included maize, wheat, rice, milk and meat. Self-sufficiency in maize was achieved for a few years during the 1970s when production was so high that some was exported. Another factor associated with strong agricultural performance was the establishment or maintenance of effective agricultural institutions most often state, parastatal or otherwise state sponsored organizations that provided services to producers within particular commodity chains. These included coffee cooperatives, Kenya Cooperative Creameries (KCC) (dairy) industry, National Cereals and Produce Board (NCPB) (maize), Kenya Farmers' Association (input supply), Kenya Meat Commission (KMC) (beef) and the smallholder Kenya Tea Development Authority (KTDA) (Poulton and Kanyinga, 2013).

However, the excessive government control mechanism put in place to support the strategy stifled progress to further stages of import substitution. These stages would have entailed the production of intermediate and capital goods. Swamy (1994) and Republic of Kenya (1986) report that by the second decade, it was quite clear that the industrialization strategy was not achieving its development objectives of creating employment and reducing poverty. The ensuing economic distortions resulted in macroeconomic imbalances and slowed overall economic growth. The small domestic market (made smaller by the collapse of the East African Community in 1977) resulted in excess capacity, further compounding this problem and making it not viable to undertake further expansion of industrial capacity based on this strategy. The only logical option was to seek export markets and thus adopt an export oriented industrialization policy.

2.2.2 Structural Adjustment Programs Phase

The second major phase in the evolution of the trade policy in Kenya was through the Structural Adjustment Programs (SAPs) introduced in the mid 1980's by Sessional Paper No.1 of 1986 on Economic Management for Renewed Growth. Structural Adjustment Programs were introduced in the early 1980s to address the structural rigidities, price instability and macro-economic imbalances that had become embedded in the economy and led to poor delivery of services by the public sector. The main thrust of the adjustment programs was to produce a shift from a highly protected domestic market to a more competitive environment that would facilitate increased use of local resources, outward

[5] Agriculture (Guaranteed Minimum Return Advances) Rules, 1977 [L.N. 12/1977]

oriented policies that would promote employment creation and export expansion. The implementation of the Structural Adjustment Programs involved the promotion of non-traditional exports, liberalization of the market system and reform of international trade regulations.

It emphasized a change from reliance on import substitution and protectionism towards a policy that led to industries being encouraged to manufacture for export with reform programs aimed at improving efficiency, stimulating private investment and increasing the sector's foreign exchange earnings. It also meant economic liberalization, bringing to an end the central role of the public sector institutions which had hitherto managed and coordinated trade distribution networks and related trade facilitation and promotion activities. The structural adjustment phase led to lowering of tariffs[6] and reduction of non-tariff barriers in Kenya's export markets thereby improving market access to Kenya's products.

During the import substitution phase, the thinking was that government involvement in agriculture was the prime mover in the growth of the rural economy, and agriculture in particular. This thinking was reversed in the 1980s, when too much government intervention in agriculture started to be viewed as having negative impacts on agriculture. State involvement was viewed as unsustainable, costly and responsible for the creation of market distortions and the budgetary implications arising there from. Beginning in the early 1980s, policy-makers from major international institutions, especially the IMF and the World Bank, in collaboration with local technocrats and policy-makers, started to call for the reduction of government involvement in productive sectors. It was believed that developing economies like Kenya would grow much faster with less government involvement, since markets would promote competition, which would motivate efficient allocation of resources and encourage innovation. This was the beginning of the liberalization paradigm. A shift towards liberalized market policies in Kenya started in the 1980s but it was not until 1993 that the government became committed to implementation of these policies (Ikiara, Juma and Amadi, 1998; Nyangito, 1998 cited in Gitu, 2006).

By the late 1980s, it was becoming clear that the government had failed to make any substantial implementation of trade policies and the economy was dangerously slowing down. As the 1990s dawned, Kenya was plunged into deep political and economic crisis. In 1991, donors withdrew their aid to Kenya for failure to comply with suggested reforms by the International Monetary Fund, World Bank and other donors, leaving the economy seriously crippled. But it was at this period that major reforms took place in Kenya as well. The government introduced major reforms which included privatization of parastatals, liberalization of financial and energy sectors, price decontrols and phasing out of import controls (Ikiara, Nyunya and Odhiambo, 2004 as cited in Gitonga, 2015).

With pressure mounting from the donors and an economy that needed a quick fix, the government came up with several major adjustment plans and reforms, notable among them the introduction of Manufacturing under Bond (MUB) in 1988, Export Processing Zones (EPZs) in 1990 and the revival of the Kenya Export Trade Authority. The government also introduced Export Guarantee and Credit Scheme, and duty and Value Added Tax (VAT) exemption scheme administered under the Export Promotion Programs Office) for tax rebates on imported inputs for exporters and essential products like drugs. In a bid to make export process smooth, the government established the Export Promotion Council (EPC) in 1992 to address bottlenecks exporters were facing (Were, Alemayehu, Ndung'u, and Karingi, 2002).

[6] Tariff reductions were not uniform but depended on the particular product

With structural adjustment programs, Kenya shifted from a food self-sufficiency goal to an outward strategy by identifying seven commodities that form the core of its current food and agricultural policy. These are maize, wheat, meat, milk and horticultural crops for both home consumption and export markets, and coffee and tea for raising farm income and earning foreign exchange. The strategy aimed to achieve multiple objectives, including family and national food security, foreign exchange earnings, government revenue, employment, regional balance and generation of new income streams for rural people (Republic of Kenya, 1986; Eicher, 1988). This strategy continues to be valid. It can thus be concluded that self-sufficiency and expansion of exports are the main objectives of the Government in the agriculture sector.

Structural adjustment led to neglect of agriculture and food production since Kenya had invested very little in promotion and enhancement of the important ingredients for agricultural development, including rural infrastructure and services, agricultural research and extension, and in the institutions that shape the governance of agriculture. Kenya had overtaxed farmers and subsidized urban consumers, while, at the same time, under investing in the rural areas. This led to shortfalls in foodstuffs, particularly maize, because of the reduced acreage, low levels of fertilizer use, discontinuation of crop insurance schemes, particularly the Guaranteed Minimum Return (GMR) and the scourge of drought (Were, Ngugi,. and Makau, 2006).

The removal of subsidies such as GMR in particular on agricultural fertilizer, and flotation of currencies, resulted in increased costs of farm inputs, making it difficult for farmers to increase or even to maintain previous production levels from the same amount of land. Furthermore, while liberalization was supposed to ensure availability of food to all people and at all times, cases of hunger are still reported to this day even in areas that were previously self-sufficient such as Turkana county where 86% of the households are food insecure (World Food Program, 2016) . Furthermore, pricing and marketing liberalization of the food sector led to dramatic producer price increases in nominal terms for most commodities due to absence of price controls and high cost of inputs. The dramatic price increase for food crops was due to removal of price controls and response to market forces, indicating that prices were set below the market price, as determined by supply and demand. Nevertheless, production volumes indicate a poor response to price increases, due to the fact that real producer prices fluctuated dramatically while the terms of trade between outputs and inputs worsened because the inputs such as fertilizer and machinery were mainly imported. Consequently, the profitability of growing food crops dropped, as the prices did not provide adequate incentives for increased production of the crops. Structural adjustment and the resulting trade liberalization led to an increase in import of foodstuffs as shown in Figures 10 and 12, and a reduction in government support to agriculture (Gitu, 2006).

Kenya's decreasing level of support to agriculture led to increasing dependence on commercial food imports and food aid. This is despite the fact that Kenya had the capacity to produce enough to meet its food needs. Per capita supply of the main staples started declining in the early 1980s, and per capita supply of cereals, declined from 140.9 kg per year between 1979 and 1981, to 115.7 kg per year in the 1992 to 1994 period. This led to Kenya experiencing serious food deficits and food insecurity (Gitu, 2006). This was a lesson for the Government of Kenya that though trade liberalization is good, it should be done with caution and especially on matters of food security.

2.2.3 Export Promotion Phase and WTO

In the 1990s, Kenya adopted export promotion strategies which proposed incentives that aimed at encouraging industries to provide for exports. Kenya's trade regime started being guided by market-

driven principles of liberalization under the World Trade Organization (WTO), which came into effect in 1995. The liberalization phase has led to lowering of tariffs and reduction of non-tariff barriers in Kenya's export markets thereby improving market access to Kenya's products. The phase also coincided with increased efforts in the regional economic integration initiatives that resulted in the establishment of the East African Community (EAC), Common Market for Eastern and Southern Africa COMESA) and the Inter-governmental Authority on Development (IGAD). In addition to the global and regional trade initiatives, the trade sector in Kenya was and is now influenced by commodity Acts and regulations contained in other various Acts under the administration of several ministries and public institutions.

The period of export oriented policies was in the 90s and early 2000s. The policies were recommended in the Sixth Development Plan (1989-1993) and Kenya was to adopt an export promotion strategy that would create a more conducive trading environment for export growth. This was to be achieved through institutional reform, reduction and restructuring of tariffs, abolition of export duties, introduction of export retention schemes, improvement of foreign exchange and insurance regulations and the establishment of the National Export Credit Guarantee Corporation (NECGC).

Between 1991 and 1992, Kenya's GDP growth rate was at an all-time low at -0.4% per annum and the government found it wise to introduce policies that would open up the economy and shift completely from inward- to outward-looking policies that would promote exports rather than stick to those that were only meant to substitute imports. The government introduced a Foreign Exchange Bearer Certificate (Forex-Cs) secondary market and retention schemes in order to liberalize the foreign exchange market.

Trade licensing requirements were abolished and exporters had control of foreign exchange earnings. The tariff structure was harmonized and tariff dispersion lowered substantially. The number of tariff bands (including duty free) was reduced from 15 in 1990/91 to 4 in 1997/98 and the top regular tariff rate from 100% to 25% over the same period (Were, Ngugi and Makau (2006); Sachs and Warner (1995).

The Seventh Development Plan (1994-96) proposed regulatory changes designed to make investments in bonded factories and export processing zones more attractive. By the end of 1994, 40 enterprises were approved to operate in six gazetted Export Processing Zones (EPZs) and, by the end of 1995, imposition of countervailing duties was the only barrier to international trade remaining (IPAR, 1995).

Apart from reforms made at a country level, Kenyan export and import scenario was poised to gain more from the new ties from the revived EAC and improvement of terms with Common Market for Eastern and Southern Africa (COMESA). Manufactured exports received the much needed boost as exports to COMESA increased from an average of 15% for the period 1990-1992 to 34% in 1996-98. The revived EAC introduced a common external tariff (CET) in 2005 and the move seemed to show positive changes. For example, in the case of Kenya's applied tariffs, there was a noted reduction from the simple average of 16.8% in 2004 to 12.7%. Kenya has continued to use EAC CET as its main trading policy instrument since 2005 (Gitonga, 2015). However, the use of tariffs with other trading partners outside of the EAC and COMESA depends on the circumstances that the country finds itself in. For example, whenever there is drought and looming shortages in staples such as maize, wheat and rice, the Government usually removes tariffs in order to allow the import of these products and more so maize. After the situation improves, tariffs are reintroduced.

2.2.4 Vision 2030 Phase

When the National Rainbow Coalition NARC government came to power in 2002, it came up with Vision 2030 which is geared towards making Kenya a globally competitive and prosperous nation with high quality of life and to transform the economy from a supply constrained outfit responsive to enhanced domestic integration and wider participation in the global economy for national and international trade expansion. The trade policy framework focused on trade promotion strategies, sector-specific strategies, commodity-specific strategies and regional and international trade regulations which sought to ensure that maximum benefits from trade are secured. This regime believed that food security can be achieved through the expansion of international trade.

There was also widespread agreement amongst the Kenyan policy making elite that something had to be done to improve agricultural performance. Agriculture was highlighted as a priority sector within the Economic Recovery Strategy for Wealth and Employment Creation (ERS) produced in April 2003. Work started almost immediately on a sectoral strategy for agriculture, eventually culminating in the Strategy for Revitalizing Agriculture (SRA) that was launched by the President in March 2004.

Kenya launched an ambitious development program called Vision 2030 whose main objective is to help transform Kenya into a "newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment (Republic of Kenya, 2007).

This program also features trade and so there are trade policies adopted to ensure that the Vision's goals are achieved. For example, the policies were geared towards promotion of decent, protected and recognized informal trade; establishment of vibrant business supported by well-established and functioning infrastructure and social amenities, expansion of Kenyan exports and thereby generate jobs and prosperity for the people of Kenya, transformation of Kenya into a regional service hub; and enhancement of opportunities and increase the digital opportunity index from access (0.17) to medium access (0.5) (Republic of Kenya, 2007).

There were no major reforms in trade policies suggested at this stage though the government seems committed to continue its exported oriented and outward looking policies adopted earlier (Gitonga, 2015). The National Trade Policy (NTP) (2015) states that the government will continue to support the trade policy instruments available for exports, which include export taxes and charges, export prohibitions, restrictions, and licensing; export subsidies and incentives; export promotion and marketing assistance, and export finance, insurance, and guarantees. The government will also continue to actively participate in international and regional trade forums like WTO, COMESA and EAC with an aim of boosting trade with other countries (Republic of Kenya, 2009).

2.3 Multilateral and Regional Trade Arrangements

The WTO framework of global trading plays a key role in Kenya's trade policy and regional trade arrangement that Kenya is a member. The policy is therefore aligned to the country's commitment at the WTO. Kenya, through her commitment under the WTO has subscribed to the multilateral trade arrangements that are defined by various WTO Agreements. Specifically, the agreements include the following: General Agreement on Trade and Tariffs (GATT), Sanitary and Phytosanitary (SPS) Agreement, Technical Barriers to Trade (TBT) Agreement, Anti-dumping Agreement, Subsidies and Countervailing Measures Agreement, Customs Valuation Agreement, Rules of Origin Agreement,

Safeguards, Trade Related Intellectual Properties (TRIPs) Agreement, Trade in Services, among others (Republic of Kenya, 2017). This promotes integration of Kenya's economy into the global trade arena, especially among the WTO member countries.

Regional trade arrangements that shape Kenya's international trade policy include: the East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA), Intergovernmental Authority on Development (IGAD) and Indian Ocean Rim-Association of Regional Cooperation (IOR-ARC).

2.3.1 East African Community (EAC)

The EAC, whose membership comprises Kenya, Tanzania, Uganda, Rwanda and Burundi brings the five countries together on issues of economic, social and political cooperation. The EAC has created an expanded market for trade in goods and services, through the provisions of the EAC Customs Union Protocol and the Common Market Protocol as well as other regional integration instruments and sectoral strategies and policies. The EAC takes the lead as the destination market for Kenya's exports, accounting for 23% in 2014. Opportunity for enhanced trade in services is abounding as is evidenced in EAC Partner States commitments under the Common Market Protocol.

Trade potential in EAC has been limited by factors that include non-tariff measures that have tariff equivalent effects (such as non-recognition of the EAC Certificate of Origin) and a host of Non-Tariff Barriers (IFC - EAC Common Market Score card (2014). Slow pace in implementation of EAC policies also contributes to limitations faced in efforts towards enhancing expansion of exports.

Domestic laws such as such as non-recognition of the EAC Certificate of Origin, that are not aligned to EAC Partner States commitments pose an immediate challenge that need to be overcome (IFC - EAC Common Market Score card, 2014). Prospects for expanding trade in service in the EAC region lie in implementation of the commitments in the Common Market Protocol (Republic of Kenya, 2017).

2.3.2 The Common Market for Eastern and Southern Africa (COMESA)

COMESA is a Regional Economic Community of 19 countries, which include Kenya. Through the Free Trade Area framework, COMESA affords Member States opportunity for expanding their trade with the region as a destination for exports or a source for imports on duty free basis. In 2014, COMESA accounted for 16% of Kenya's total exports, whose trend over the period 2011 - 2014 is characterized by sluggish and near constant growth rate. Over the same period, COMESA recorded tremendous growth in imports, implying existence of trade potential that needs to be exploited in order to increase exports to this regional bloc.

COMESA regional integration also covers trade in service, a sector where Kenya is a key player in the regional economic community (REC). COMESA member states have undertaken measures to progressively liberalize trade in services in the region. Member states have identified four initial sectors to start liberalization. These sectors are tourism, communication, financial services and transport. Additional sectors should be identified to achieve higher levels of liberalization. The region therefore offers opportunities for strong growth in these sectors (Republic of Kenya, 2017).

2.3.3 Intergovernmental Authority on Development (IGAD)

IGAD comprises of the following countries in the horn of Africa: Djibouti, Somalia, Eritrea, Sudan, Ethiopia, Uganda and Kenya. IGAD has been transformed into a Regional Economic Community

(REC) and its mandate expanded from drought and desertification to include an economic and trade agenda. It therefore provides a regional integration framework through which trade between the seven countries can be expanded using shared commitments in other RECs (such as COMESA) to deepen trade integration. There exists opportunity to exploit the market potential in these countries through use of the IGAD framework (Republic of Kenya, 2017).

2.3.4 EAC/COMESA/SADC TRIPARTITE Free Trade Area

The EAC/COMESA/SADC Tripartite FTA, whose formation is based on the directive of the Heads of State Summit of 22nd October 2008, was eventually launched on 10th June 2015, covering the first phase of integration that includes trade in goods. Kenya stands to gain a lot from the expanded regional market of 26 countries, to be accessed under a Free Trade Area arrangement (Republic of Kenya, 2017).

2.3.5 African Growth and Opportunity Act (AGOA) 2000

Kenya, along with other beneficiary Sub-Saharan African countries, has benefited from a preferential trade arrangement provided by USA through the African Growth and Opportunity Act (AGOA). The beneficiary countries have to meet eligibility criteria set out in the Act which includes establishment of a market based economy and issues of good governance. This trading program was initially expected to expire in 2015 was on 1st July 2015 extended by another 15 years. Kenya has benefited immensely from AGOA through duty free exports of various products to the US. These products are however dominated by apparel. There exists opportunity to explore broadening of exports to cover other AGOA eligible products (Republic of Kenya, 2017).

2.3.6 Economic Partnership Agreements (EPAs)

Kenya together with the other EAC Partner States concluded negotiations of the EPA in October 2014 paving way to the process of signing and ratification. The EPA is the framework that guarantees sustainability of the over 30 years duty free market access trade regime that Kenya's exports have enjoyed in the European Union (EU), first under the four successive Lome Conventions, then under the Cotonou Agreement and lastly under the Framework for establishment of EPA (FEPA). The impact of this preferential trade regime has been to open up the EU market, which in 2014 accounted for 22% of Kenya's exports, taking a second position as a destination market for Kenya's exports after the EAC.

In the EU, five countries, out of the 28 EU member states account for 85% of total Kenya's exports into the EU. The export products are dominated by flowers, horticulture and traditional exports, coffee and tea. There exists opportunity for Kenya to exploit market potential in the 28 EU member States, beyond the traditional destination markets of Netherlands, Britain, Germany, Belgium and Italy. There is also opportunity to broaden the country's export base using the flexible rules of origin that were negotiated under the EPA.

Kenya, along with other EAC Partner States has taken commitment to open up the EAC market for EU products under the EPA framework. This covers all products that these countries have committed to liberalize with time. Sensitive sectors have been protected through the exclusion list. Liberalization of raw material and intermediate products from the EU contributes towards competitiveness of the industries that import these products for production of finished products. In that sense, the EPA contributes towards international trade policy for transformation of Kenya into a competitive export led

economy. The EPA now guarantees Kenya's duty free quota free market access in the EU on contractual long term basis, which the country can now rely on in planning for investments targeting the EU as a destination market for her emerging industries (Republic of Kenya, 2017).

2.4 Bilateral Trade and Investment Agreements

Kenya has signed bilateral trade and investment agreements with both developed and developing countries[7] (Republic of Kenya, 2017) that fulfill the following objectives:

(a) Reciprocal participation in exhibitions and trade fairs as well as respective country week promotional events;
(b) Exchange of market intelligence, missions/surveys for market information;
(c) Encouragement of institutional cooperation such as the Standards Institutions; Chambers of Commerce and Industry, Customs Organizations, Research Institutions among others;
(d) Prompt and focused follow up of issues raised during bilateral meetings;
(e) Exchange of general and product specific trade and investment missions; and
(f) Promotion of Trade and Investment.

2.5 Trends in Production

This section discusses trade data of maize, wheat, dairy, beef and vegetables in terms of production, quantity and value of exports and imports and sales. It also discusses tariffs as well as quantity and value of exports and imports by trade destinations for the same products. Figures 1-4 and Figure 33 in Appendix 1 show the trends in production of maize, wheat, dairy, vegetables and beef respectively. During 1963-1978 (Import Substitution Phase), maize production was about 500,000 metrics tons albeit rising. This could be attributed to the protectionist policy of import substitution, which included subsidies in fertilizers, guaranteed minimum returns and a ready market of produce by the National Cereals and Produce Board (NCPB). Production rose from and peaked to 2,349,000 MT in 1982 before declining drastically to 583,000MT in 1985 and remained around 500,000MT up to 1992. This plunging of production coincided with the introduction of SAPs which included removal of subsidies leading to an increase in the cost of production. In addition, there was blatant mismanagement of statutory institutions such as NCPB, Agricultural Finance Corporation (AFC), Kenya Cooperative Creameries (KCC), and Kenya Farmers Association (KFA) among other agricultural related institutions. From 1993, production rose to 2,621,000MT in 1995 coinciding with the founding of WTO and the start of export promotion strategy in Kenya.

[7] Bangladesh, Canada, China, Comoros, Congo, DRC, Djibouti, Egypt, Ethiopia, Hungary, India, Iran, Iraq, Lesotho, Liberia, Mauritius, Mozambique, Netherlands, Nigeria, Pakistan, Russia, Rwanda, Somali, South Africa, South Korea, Sudan, Swaziland, Tanzania, Thailand, Turkey, Ukraine, Zambia, Zimbabwe and Libya

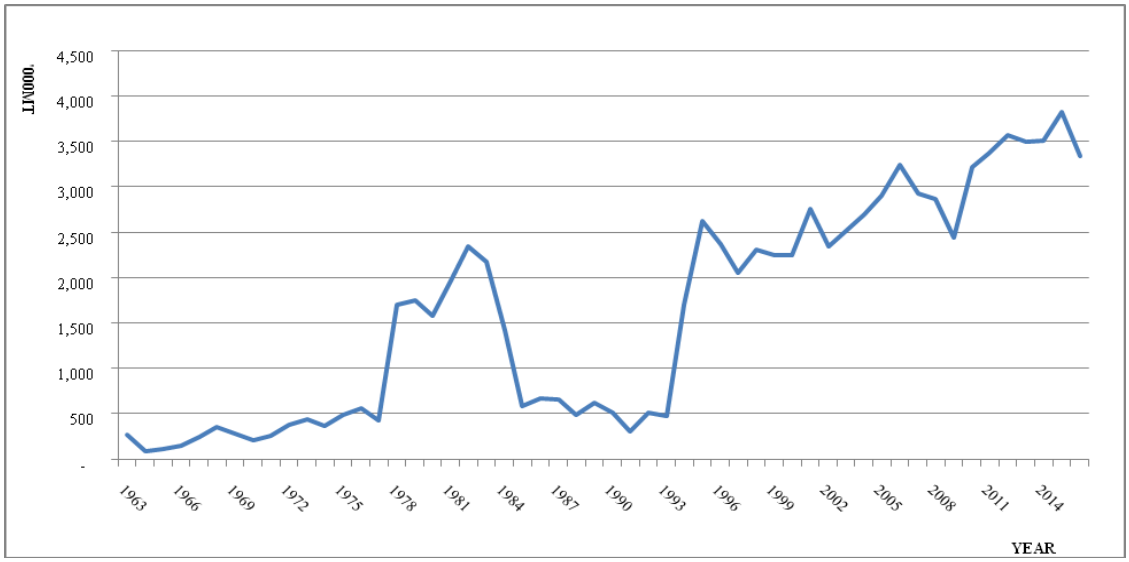


Figure 2.1: Quantity of Maize Produced ('000MT): 1963-2016. Source: Economic Surveys, Various issues

From 1995 production fell to almost 2,000,000MT in 1997 before rising slightly to 2,754,000MT in 2001, which coincided with the clamor for multi-party democracy, ensuing tribal clashes and the consequent displacement of farmers in both maize and wheat growing areas. From 2002 production has been rising with the exception of 2007/2008 following the post-election violence which resulted in massive internal displacements of persons particularly in Kenya's food basket regions of the Rift Valley. The rise in production is attributed to several policies including the Economic Recovery Strategy (ERS) (Republic of Kenya, 2003), Strategy for Revitalization of Agriculture (SRA)(Republic of Kenya, 2004), and Agricultural Sector Development Strategy (ASDS) (Republic of Kenya, 2009) (see Chapter 3 for a detailed discussion of these policies). During this period there was greater inter-sectoral coordination of strategies and policies geared towards achieving Vision 2030 anchored on social, political and economic pillars (Republic of Kenya, 2007). Agriculture, trade and infrastructure were among the seven sectors in the economic pillar. Within agriculture some of the flagship projects included fertilizer cost reduction initiative (subsidizing fertilizer mainly for small scale farmers in order to increase food production aimed at food security), setting up of livestock disease free zones in the Arid and Semi-Arid Lands (ASAL) regions, irrigation projects and implementation of the consolidated agricultural reform legislation. In the trade sector there was creation of producer business groups (Republic of Kenya, 2007).

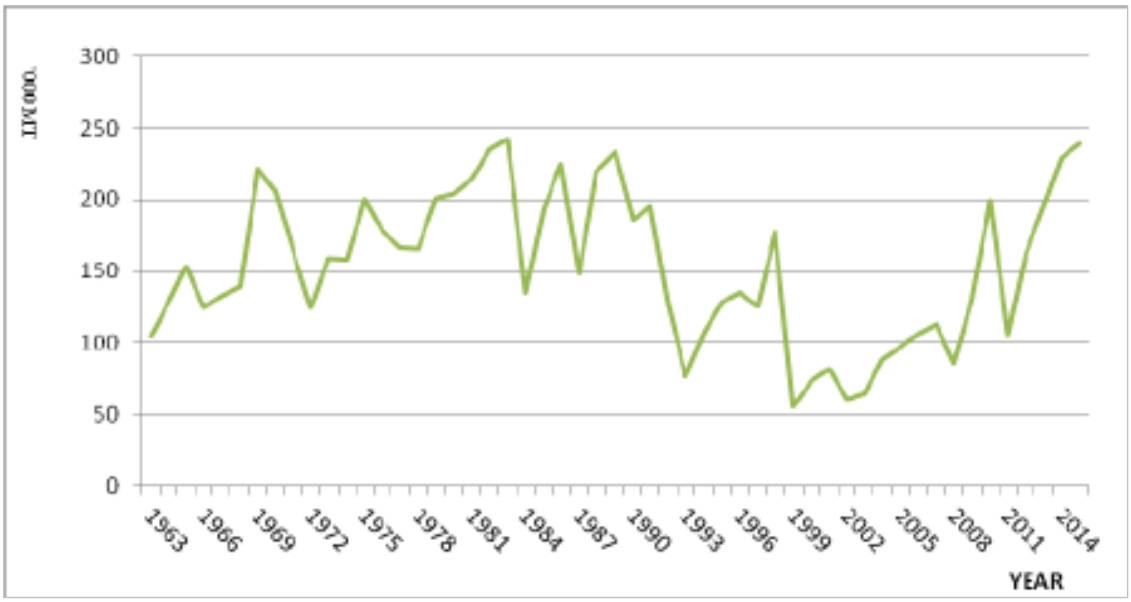


Figure 2.2 Quantity of Wheat Produced ('000MT): 1963-2015. Source: Economic Surveys, Various issues.

Figure 2 shows that wheat production generally rose gradually from 105.2MT to 242.3 during 1963 to 1983. The production hit a low of 135.4MT and 148.3MT in 1984 and 1987 respectively before rising to 233.2 MT in 1989. Thereafter wheat production dropped drastically to 76.9MT in 1993 coinciding with the SAPs regime. The increase in production up to 1998 could be attributed to the onset of liberalization policies though this trend was disrupted by the tribal clashes of 1997 in the wheat growing areas of Rift Valley, which saw production falling to 55.1MT in 1999. Starting from 2002, production has been on the rise reaching 238.6MT in 2015, although there was occasional decline in 2008 and 2011 largely attributable to the adverse political events of 2007/08 post-election violence and 2010 constitutional referendum causing disruptions in food production regions of the country. In general just like the case of maize production, the ERS, SRA and ASDS policies discussed above have largely contributed to increase in production.

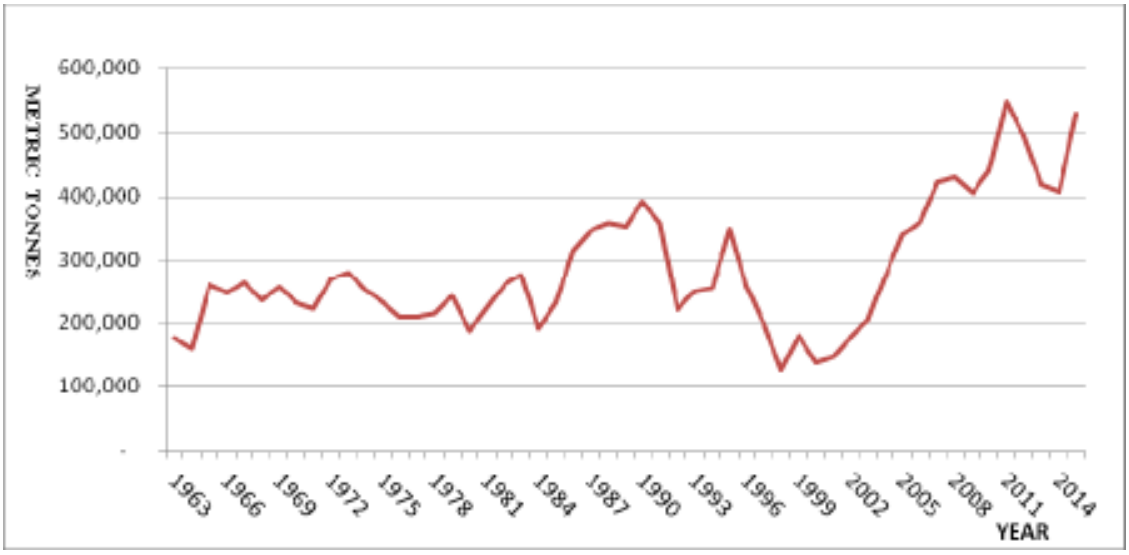


Figure 2.3 Quantity of Milk Produced (Metric Tons): 1963-2015. Source: Economic Surveys, Various issues; Statistical Abstracts, Various Issues.

Milk production more or less mirrors the same trends as maize and wheat production. Figure 3 shows that from independence to 1983 (Import Substitution Phase), production fluctuated around 159,385 to 275,000 metric tons. Between 1984 and 1990 (SAPs phase) milk production increased from 190,000 to 392,000 metric tons before plunging to 126,000 metric tons in 1998. The 1990s decade was characterized by clamor for multi-party democracy which saw the 1992 and 1997 tribal clashes and displacement of persons, mostly in farming regions. In addition, the impacts of SAPs and subsequent liberalization policies in the early 1990s may have adversely influenced production. Between 2000 and 2015, production gradually rose from 137,000 to 528,900 metric tons respectively, during which the highest level of 549,000 metric tons was attained in 2011. As stated earlier during this period the policies largely supported the revitalization and growth of the economy by supporting a competitive agricultural sector.

However, data on production of beef is largely incomplete and where available, it refers to live heads of cattle. Figure 4 presents the trends in quantity of vegetables produced, which has been consistently on the rise.

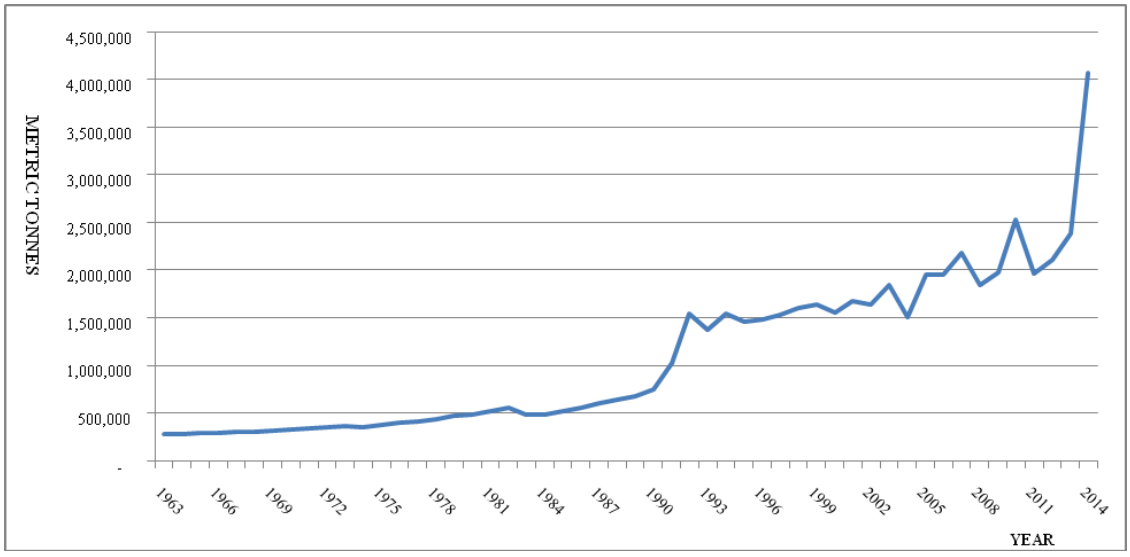


Figure 2.4 Quantity of Vegetables Produced (Metric Tons): 1963-2014. Source: Economic Surveys, Various issues; Horticulture Validated Reports, 2007, 2014.

Production of vegetables rose slowly from 280,844 to 552,615 metric tons between 1963 and 1982 and then steadily increased from 478,591 to 1,547,687 metric tons between 1993 and 2002. The period between 2003 and 2014 saw the fastest rise in production from 1,841,360 to 4,076,981 metric tons respectively. It is worth noting that substantial production of vegetables occurs under greenhouse technology and may therefore not suffer from adverse climatic conditions, which coupled with supportive agricultural sector growth and export promotion policies explains the gradual growth in production.

2.6 Trends in Sales

Figures 5-9 present the trends in sales of maize, wheat, dairy, beef and vegetables respectively. Although data for vegetable sales was available for a shorter duration (2001-2016), the general trend in sales for the five commodities appears to be similar and largely mirrors the production trends and the reasons for the changes can also be explained by the trade regimes, agricultural and trade policies and the political climate at the time.

Figure 5 shows sales of maize rising very slowly from 0.06 to 0.93 Ksh. billion between 1963 and 1991, and then moderately up to 6.1416 Ksh. billion in 2001 and very steadily henceforth up to 13.513 Ksh. billion in 2015. However, three distinct periods characterized by rising sales include; 1992-2001, 2003-2007 and 2009-2015. Of particular note is the steady rise in sales since 2003 which corresponds to regimes of coordinated policies and strategies aimed at making production and marketing of agricultural produce conducive and competitive. However, sales dropped in three periods namely: 2002, a period during which there was a change in the political regime; 2008 due to post election violence and; 2013 onwards which could be attributed to adverse weather conditions and subsequent drop in production. The drop in production due to poor weather since 2016/17 has necessitated government intervention through removal of import duties of maize and subsidies to millers in order to curb the prevailing food insecurity situation (Daily Nation, 2017). This shows that even though the Government of Kenya is committed to trade liberalization, certain circumstances necessitate government intervention in the form of subsidies and removal of import tariffs when necessary.

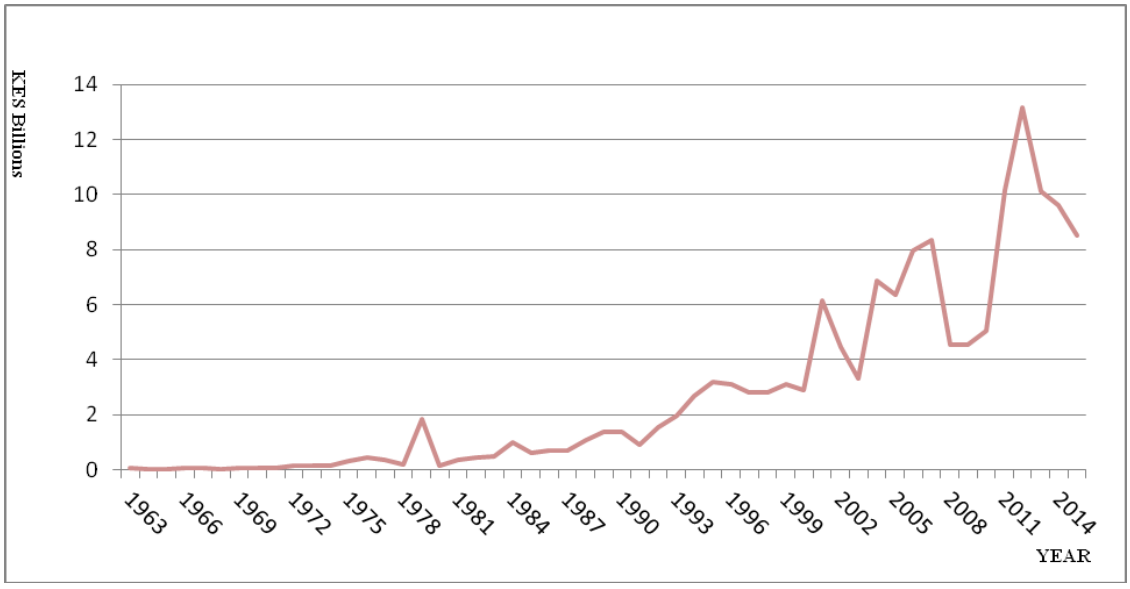


Figure 2.5: Maize Sales (Ksh. billion): 1963-2015. Source: Economic Surveys, Various issues.

Figure 6 shows that except for 1987, wheat sales were low and largely below one billion Ksh. during the period 1963-1993. Sales rose between 1993 and 1998 to Ksh. 2.99 billion and then fell to around one billion Ksh. up to 2002. Thereafter sales of wheat have been rising to peak at Ksh.8.2 billion in 2015, except for of about Ksh.2 billion in 2011.

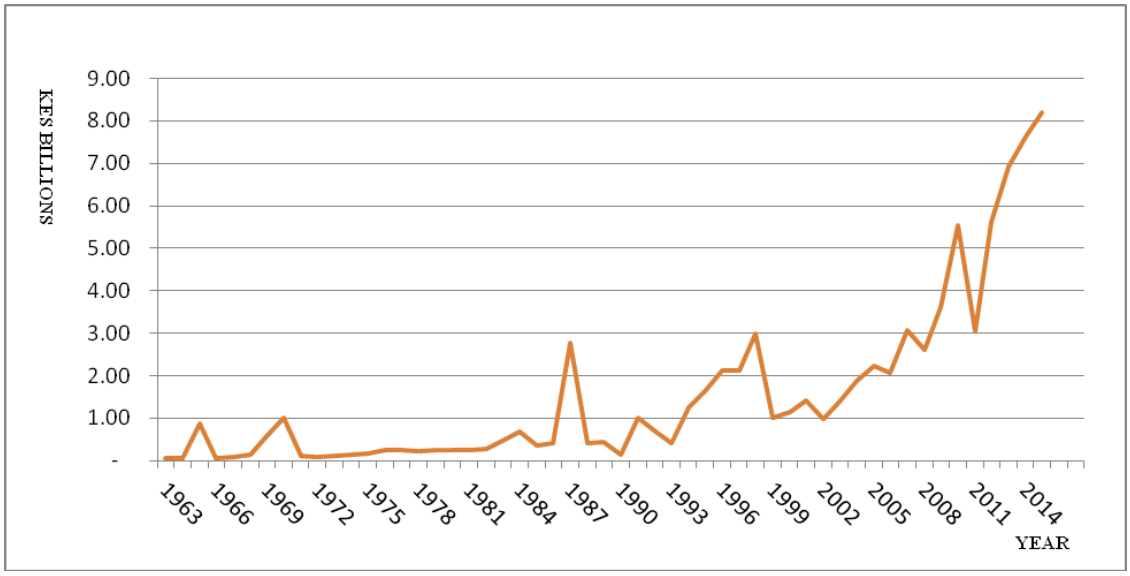


Figure 2.6: Wheat Sales (Ksh. Billion): 1963-2015. Source: Economic Surveys, Various issues.

Figure 2.7: Dairy Sales (Ksh. Million): 1963-2015. Source: Economic Surveys, Various issues; Statistical Abstracts, Various Issues.

Figure 7 indicates a general trend of rising dairy sales with almost exponential growth since 1994. The data shows that a rather slow growth in sales up to 1993 that largely remained below Ksh.841 million. Thereafter, the periods between 1994/95, 2001-2007 and 2010-2015 experienced rapid increase in sales reaching the highest level at Ksh. 8,462 million in 2007, but with a drop in sales during 1996-2001 and 2008/09.

Figure 8 presents beef sales in Kenya shillings from 1963 to 2015.

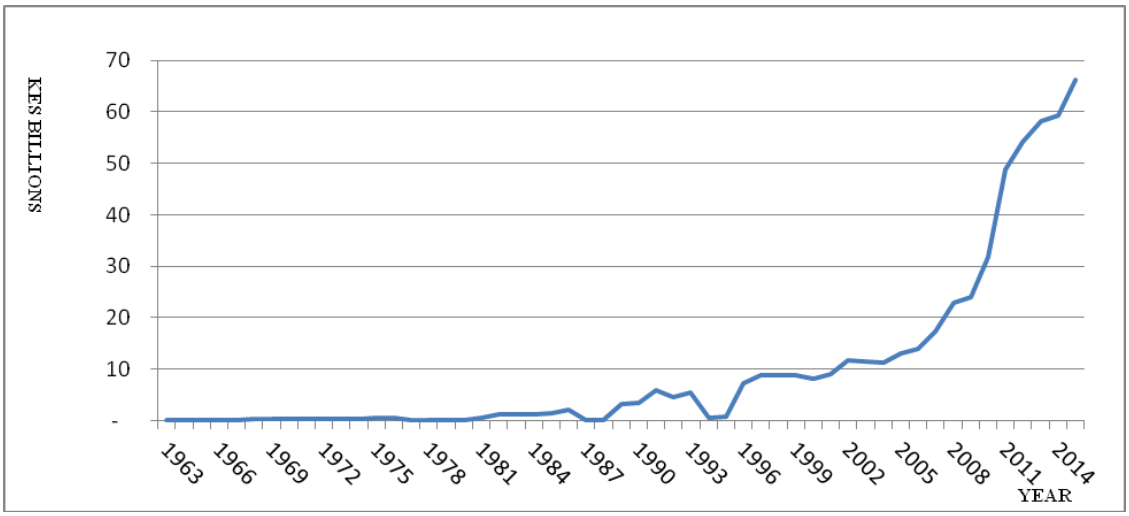


Figure 2.8: Beef Sales (Ksh. Billion): 1963-2015. Source: Economic Surveys, Various issues.

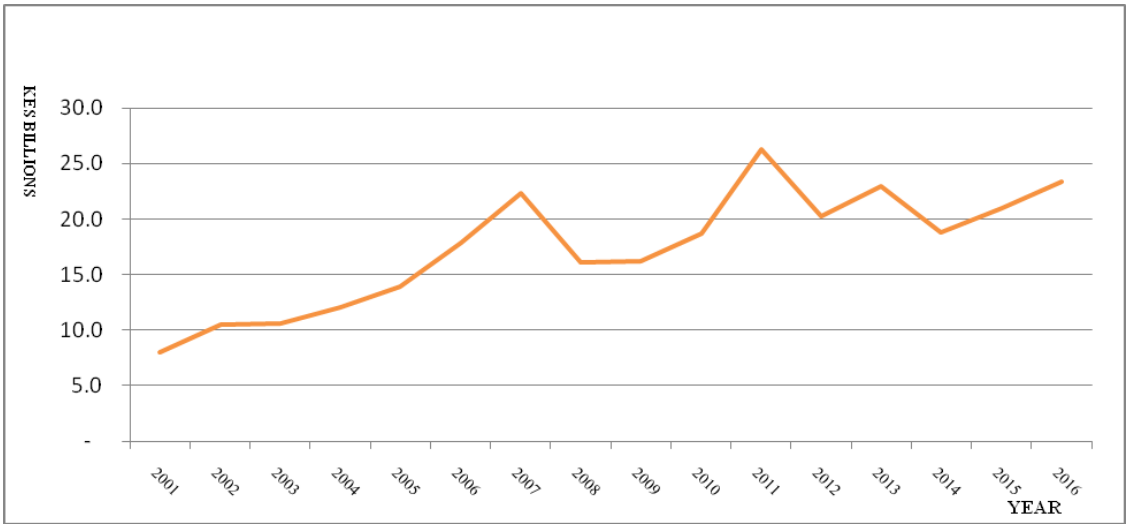


Figure 2.9: Value of Vegetables Sales (Ksh. Billions): 2001-2016. Source: Economic Surveys, Various Issues; Horticulture Validated Reports, 2007, 2014.

Beef sales were nearly constant at below Ksh. two billion up to 1995, except for the period 1989-1993 which ranged between Ksh. 3-6 billion (See Figure 8). Between 1996 and 2006 sales saw a gradual rise from Ksh. 7-14 billion and thereafter rose exponentially to attain a high of Ksh.66 billion in 2015.

Data for vegetable sales was available from 2011 and indicates an increasing trend albeit some fluctuations. Three periods of sales increases were 2001-2007, 2009-2011 and 2015-2016 where sales rose from Ksh. 8-22.4, Ksh. 16.3-26.3 and Ksh. 20.9-23.4 respectively, with peaks in 2007 and 2011 which has the highest sales to date. The fall in vegetable sales from 2007 to 2009 corresponds to the post-election violence experienced in Kenya in early 2008 and also to the global financial crisis that adversely impacted on the demand for vegetables in the European Union countries since they are the major importers of vegetables from Kenya. On the other hand, the rise in sales of vegetables largely corresponds with those periods of export promotion strategies and favorable agricultural policy regimes as discussed in chapter 3.

2.7 Trends in Quantity and Value of Exports and Imports

This section discusses trends in quantity and values of exports and imports for maize, wheat, dairy, beef and vegetables. Figures 10 and 11 present quantity and value of maize exports and imports respectively. Exports of maize have remained low over the years mostly below 2 million metric tons mainly because maize is exported only after local demand has been met. The data displays a negative trend in maize exports while that of imports is positive indicating growing imports of maize over the years. The implication is that Kenya is not self-sufficient in maize, which is a staple food. Before 1979, Kenya was a net exporter of maize but since 1992 imports of maize have grown and outstripped exports, a reflection of trade liberalization policies and imply an unstable food security situation hence giving credence to the notion that liberalization should be done with caution. The value of both maize exports and imports as presented in Figure 11 show a positive trend although the value of imports has grown almost 15 times faster than that of exports indicating a trade deficit in maize trade and a negative trade balance.

Up to around 1991 value of both exports and imports of maize remained low, a reflection of protectionist policies of import substitution, SAPs and the pre-liberalization controlled regimes.

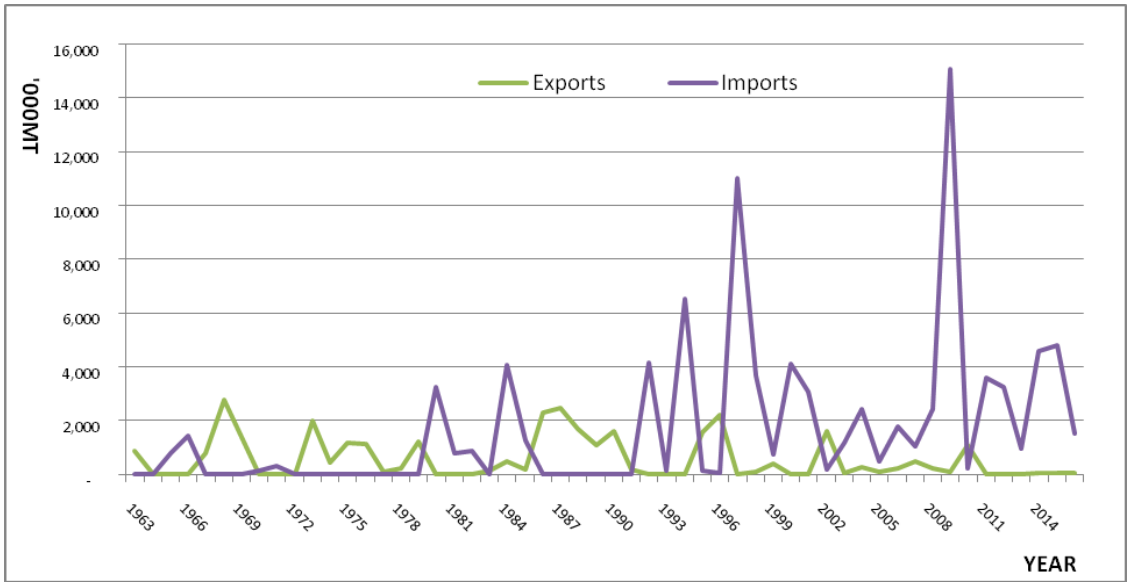


Figure 2.10: Maize Exports and Imports ('000MT): 1963-2016. Source: Economic Surveys, Various issues

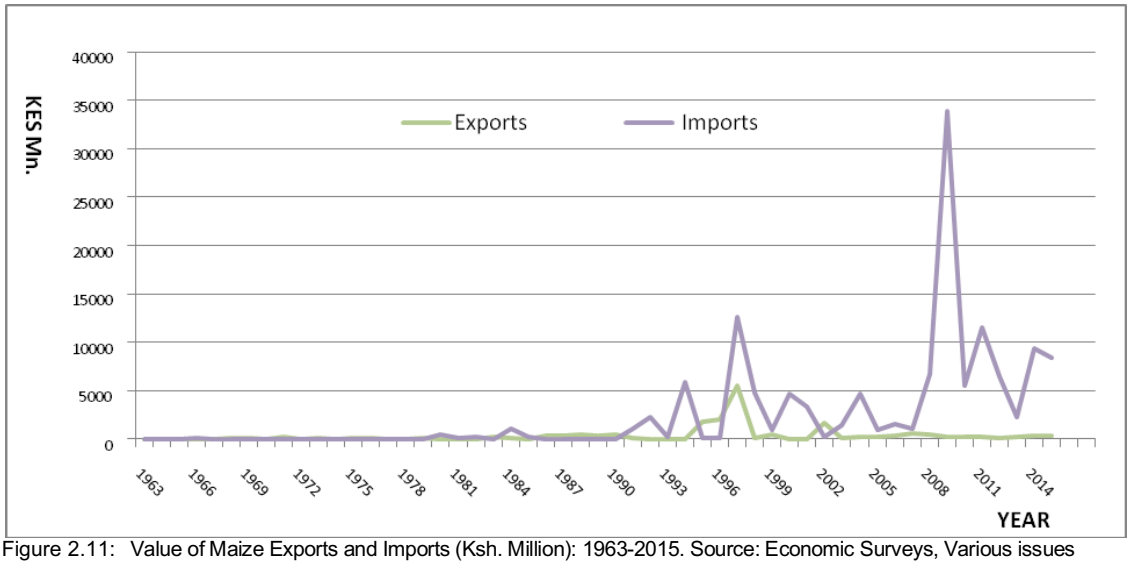


Figure 2.11: Value of Maize Exports and Imports (Ksh. Million): 1963-2015. Source: Economic Surveys, Various issues

From 1992 the value of imports has been on the rise while that of exports has remained low especially since 2003. Figures 12 and 13 present quantity and value of wheat exports and imports respectively. Wheat has exhibited a trade deficit throughout the years.

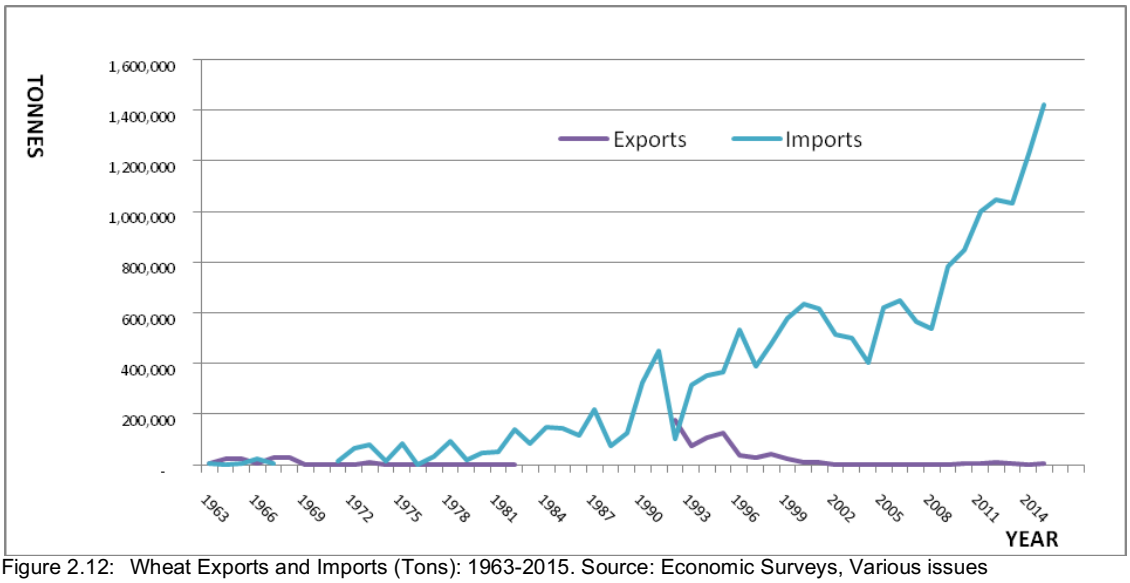


Figure 2.12: Wheat Exports and Imports (Tons): 1963-2015. Source: Economic Surveys, Various issues

During the period 1963-1992, wheat imports remained below 200,000 metric tons except for 1991. This period coincides with the import substitution regime and part of the SAP regime. However, imports rose nearly 14 times between 1993 and 2015 when they attained a peak of 1,421,800 metric tons.

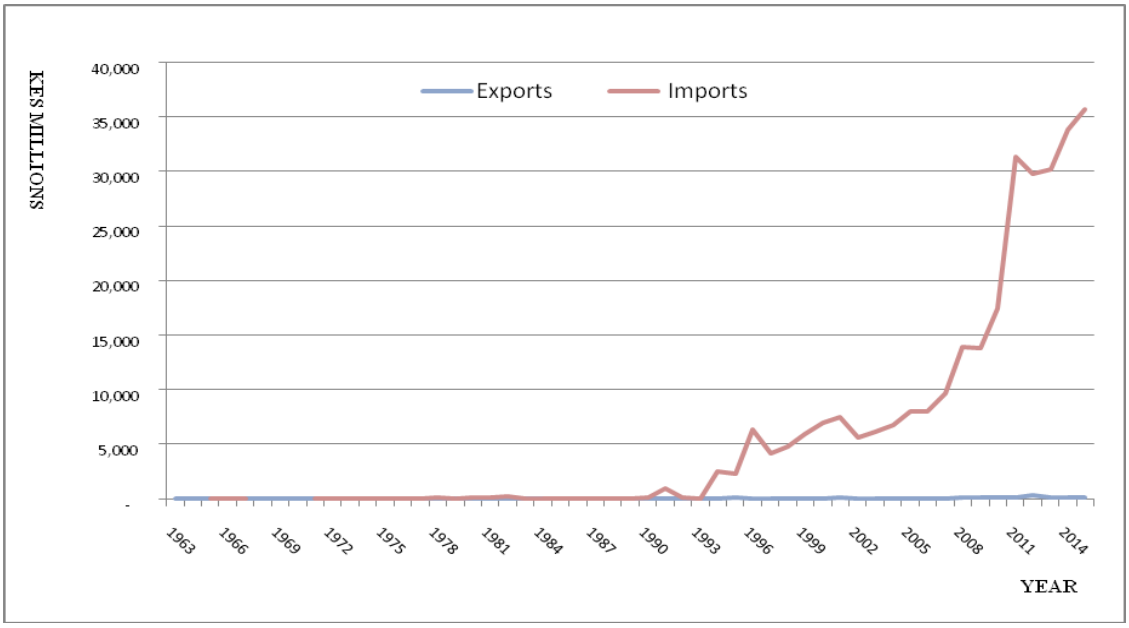


Figure 2.13: Value of Wheat Exports and Imports (Ksh. Million): 1963-2015. Source: Economic Surveys, Various issues

This can be explained by the increased demand for wheat as a result of increased urban population plus the fact that the local production could not meet demand for wheat. On the other hand, exports dropped 22 times between 1993 (73,000 metric tons) and 2015 which could be as a result of a drop in wheat production due to drought and wheat rust and increased demand for wheat. The period before 1993 is characterized by very low values of both wheat exports and imports. However, from

1993 the value of imports rose phenomenally from Ksh. 3 million to Ksh. 35,663 million, over 11,000 times! In contrast, during the same period the value of exports rose 11.5 times from Ksh. 12 million in 1993 to Ksh. 138 Million in 2015.

Figures 14 and 15 present the quantity and value of Kenya's dairy exports and imports respectively. Trade in dairy exhibit fluctuations in both exports and imports levels with numerous periods of deficits and surpluses. The periods 1969-1979, 1987-1991, 1995-1997, and 2002-2014 are characterized by trade surpluses, with the last period exhibiting growing levels of exports compared to imports. Between 2002 and 2014, exports increased from 1,803 to 10,667 metric tons compared to 861 to 4,262 metric tons for imports. Exports of diary increased 6 times compared to 5 times for imports with the surplus growing by 7 times during the same period. This shows a favorable trade situation for dairy sector in the last decade or so. On the other hand, the deficit experienced during 1980-1986 almost mirrors the later surplus situation.

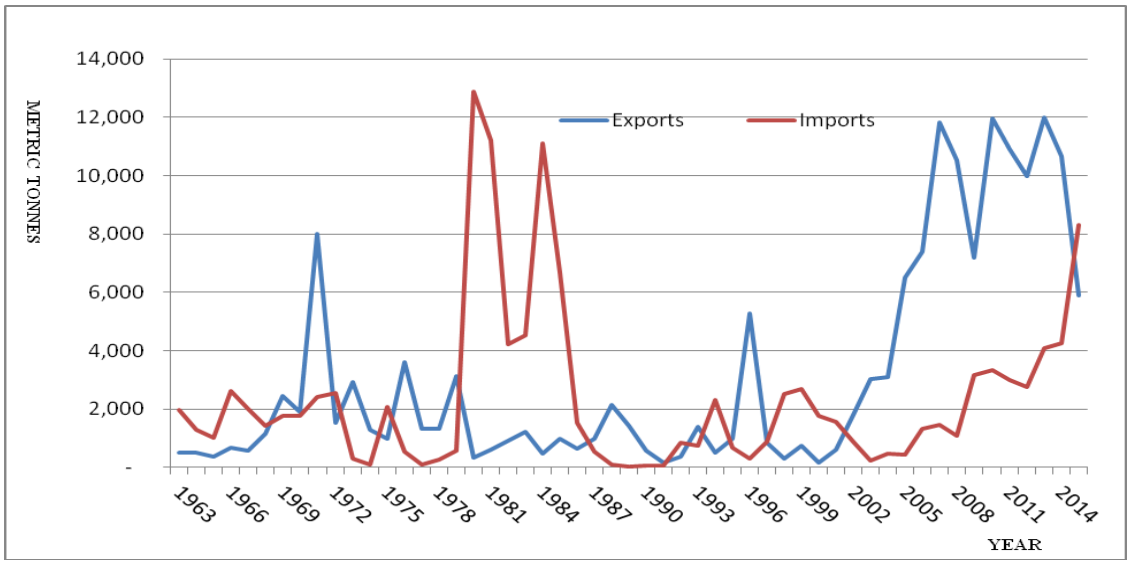


Figure 2.14: Quantity of Dairy Exports and Imports (Metric Tons): 1963-2015. Source: Economic Surveys, Various issues; Statistical Abstracts, Various Issues.

Trade in dairy in terms of value is also characterized by surpluses and deficits. Value of exports and imports was very low till 1991, during which time there was a trade surplus except for 1980-1986. Trade surpluses were also experienced in 1993, 1995-1997 and 2006-2011. Since 2012 trade in dairy was in deficit and widening. It is worth noting that the value of both exports and imports grew rapidly beginning the 2000s during which time there were favorable agricultural policies including agricultural subsidies leading to increased production of dairy, liberalization in milk processing and the opening up of private milk processing firms.

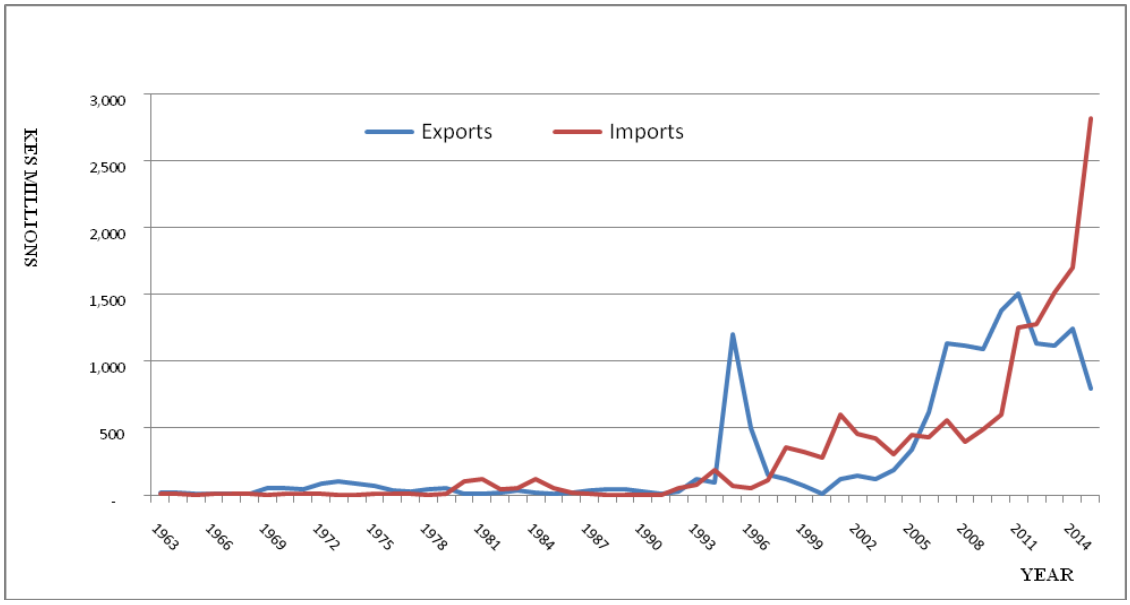


Figure 2.15: Value of Dairy Exports and Imports (Ksh. Million): 1963-2015. Source: Economic Surveys, Various issues; Statistical Abstracts, Various Issues.

Figures 16 and 17 present quantity and value beef exports and imports respectively. Data on beef imports was available up to 1975 and exhibits low and declining trends. Exports of beef on the other hand exhibit a U-shaped trend. Quantity of beef exports were generally declining, though with fluctuations until 1987. Exports of beef rose slightly during 1988-1999, before hitting a low in 2002. Thereafter exports were on a rising trend with the highest quantity in 2012 at 11,000 metric tons.

Data on value of beef imports was available till 1975 and in comparison with value of exports; this was a trade surplus period. In general the value of exports remained low until 2001 with a high of Ksh. 161 million in 1968. Value of beef exports rose rapidly from 2002 attaining a high of Ksh. 3,097 million in 2015 coinciding with the re-opening of the Kenya Meat Commission which processes beef for export.

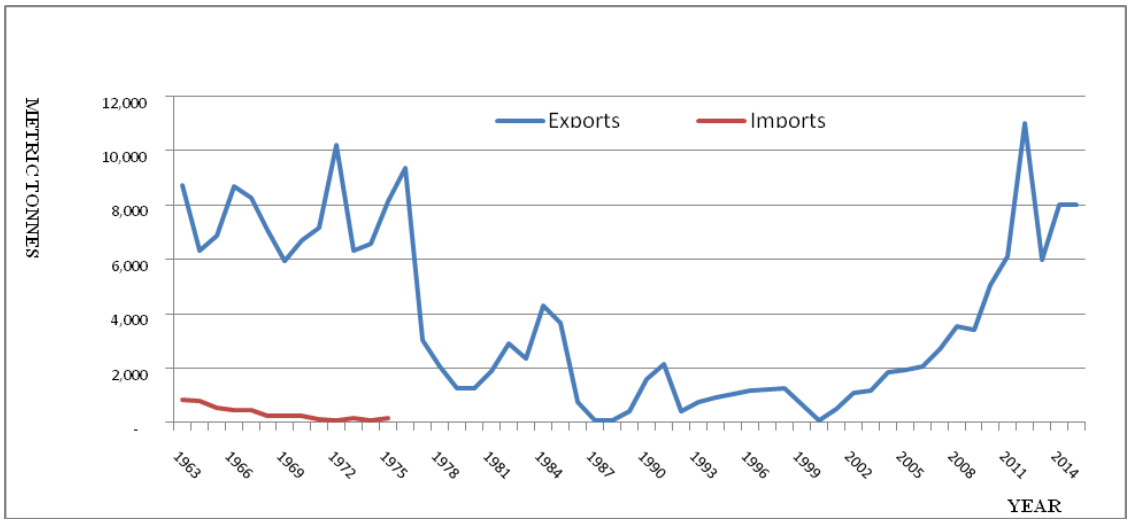


Figure 2.16: Quantity of Beef Exports and Imports (Metric Tons): 1963-2015. Source: Economic Surveys, Various issues.

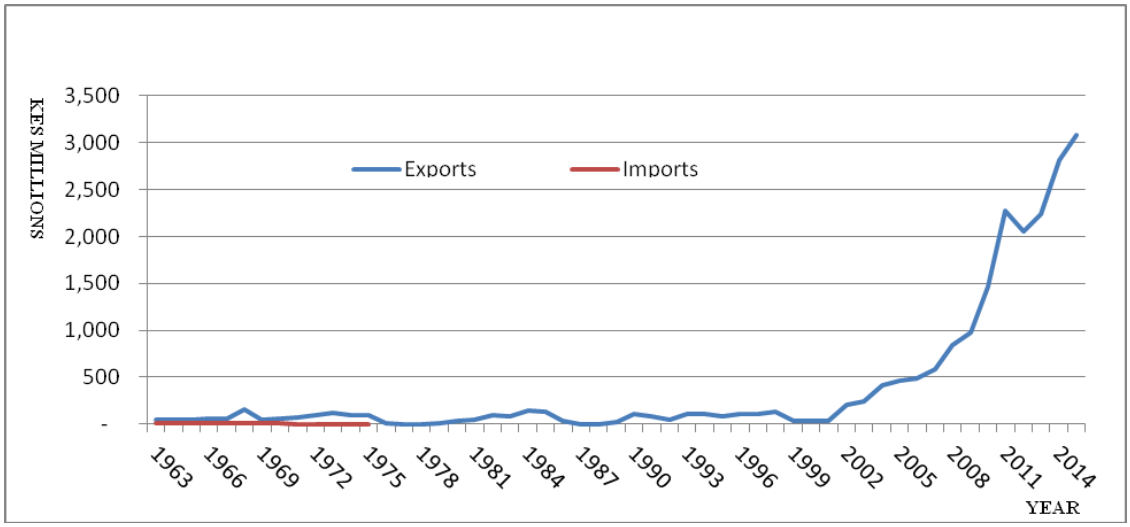


Figure 2.17: Value of Beef Exports and Imports (Ksh. Million): 1963-2015. Source: Economic Surveys, Various issues.

Figure 18 presents the value of vegetable exports and imports. Data on quantities of vegetable exports was unavailable. However, the trends in value of vegetable exports and imports indicate a trade surplus during 1963-2015. Imports of vegetables began to rise around 1993 while those of exports started rising from 1983. The value of exports has been rising rapidly attaining the highest level of Ksh. 30,959 million in 2008 but has been falling since. On the other hand the value of imports peaked at Ksh. 10,086 million in 2012 and has been on the decline since.

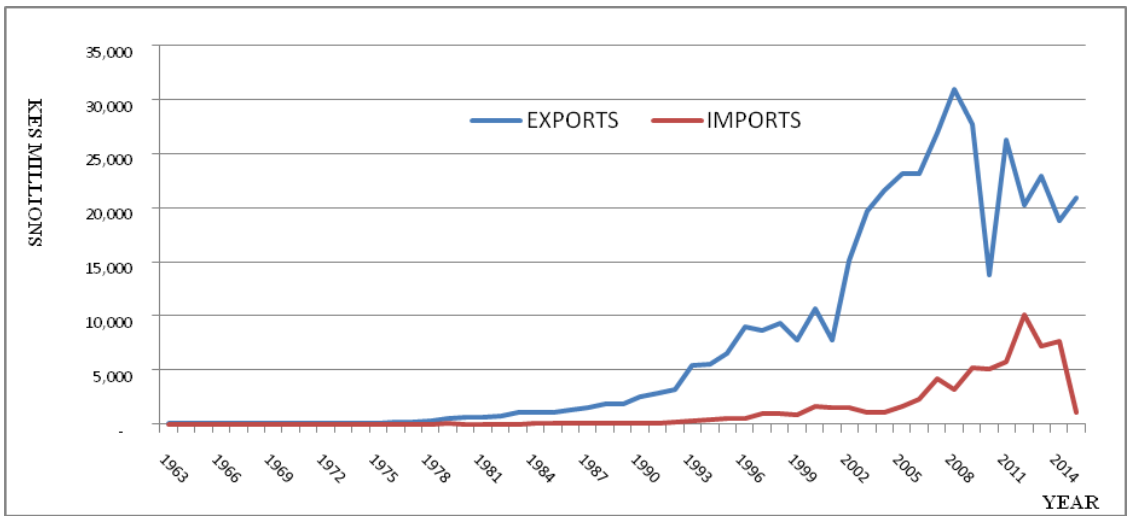


Figure 2.18: Value of Vegetables Exports and Imports (Ksh. Million): 1963-2015. Source: Economic Surveys, Various issues; Horticulture Validated Reports, 2007, 2014

2.8 Market Access

This section looks at market access of the products discussed in the preceding section. It looks at the trends in tariffs for exports and imports imposed by countries of destination for the products and export tariffs that Kenya imposes on the products.

2.8.1 Tariffs

Figure 19 shows that there are no import or export tariffs for processed[8] maize to the EAC and to COMESA regions. The products from the countries in these regions are zero rated due to the regional integration agreements agreed upon by member states. On the other hand, imports from SADC and from the Organization for Economic Cooperation and Development (OECD) were taxed duty at the rate of 50% until 2015. In 2016, imports from these countries were taxed at 41.12%. However, Kenya's exports of processed maize to the OECD were taxed duty of 6% in 2015 and 2016 due to Kenya's delay in signing the Economic Partnership Agreement while exports to the SADC were taxed duty of 30% in 2016.

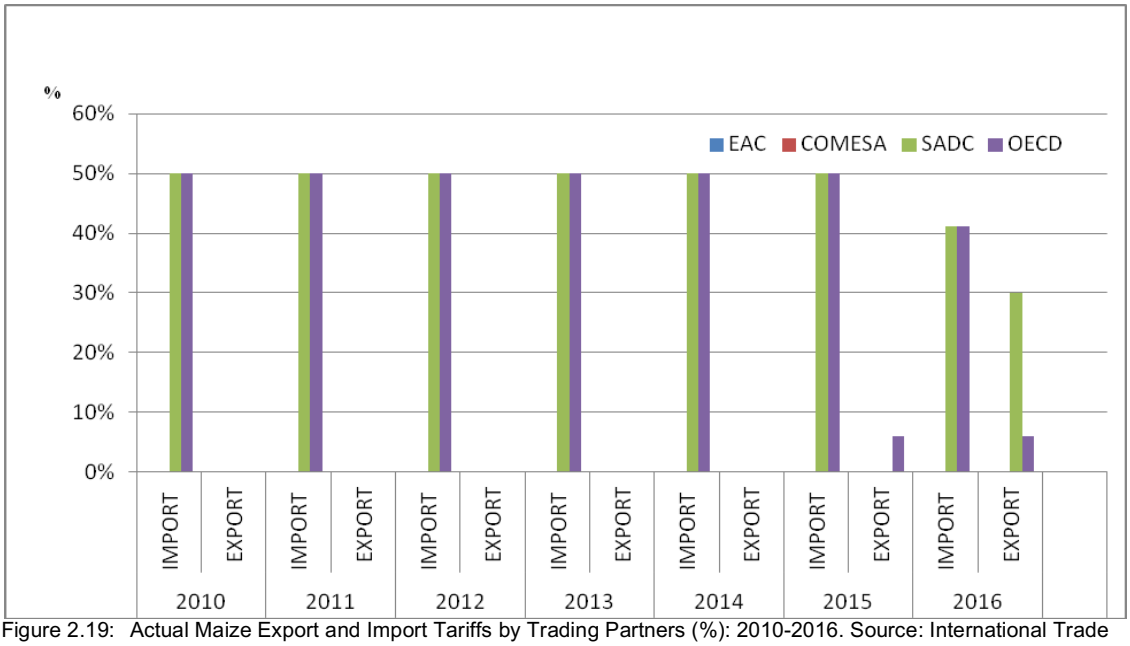


Figure 2.19: Actual Maize Export and Import Tariffs by Trading Partners (%): 2010-2016. Source: International Trade Centre.

On the other hand, Kenya's exports and imports of processed wheat have all along been zero rated to all the trading partners (EAC, COMESA, SADC and OECD) until 2016 when imports to SADC and to OECD attracted tariffs of 13.78% while exports to SADC were taxed at 30% and those to OECD attracted export duty of 6% as shown in Figure 20.

[8] Data was not available for tariffs for unprocessed products.

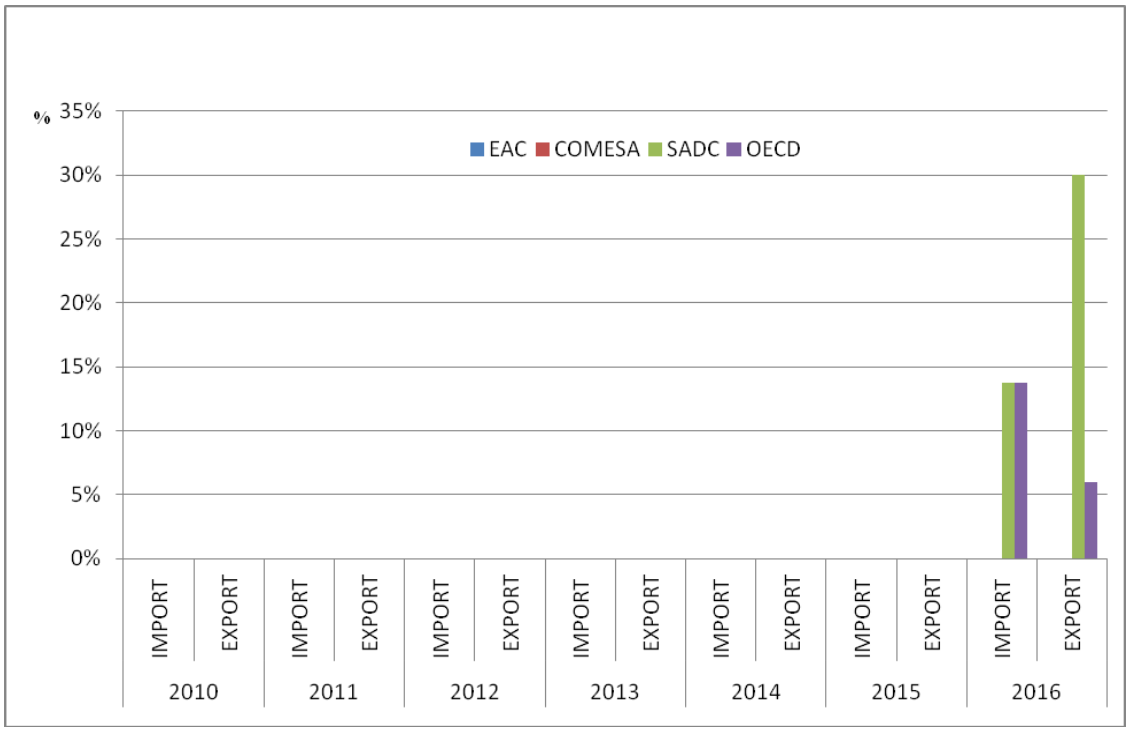


Figure 2.20: Actual Wheat Export and Import Tariffs By Trading Partners (%): 2010-2016. Source: International Trade Centre.

Figure 21 shows Kenya's exports and imports tariffs of processed daily products. Just like maize and wheat, there are no export or import tariffs between Kenya and its trading partners in the EAC and COMESA. However, it is clear that OECD countries have been imposing tariff barriers on Kenya's dairy processed products by charging export tariffs of 65.81% for processed daily products to enter their market until 2016 when export tariffs fell to 6% to the OECD and 8% to the SADC region. On the other hand, processed daily products have been attracting import duty to Kenya of 60% until 2016 when the tariffs fell to 53.12% in these two trading partners.

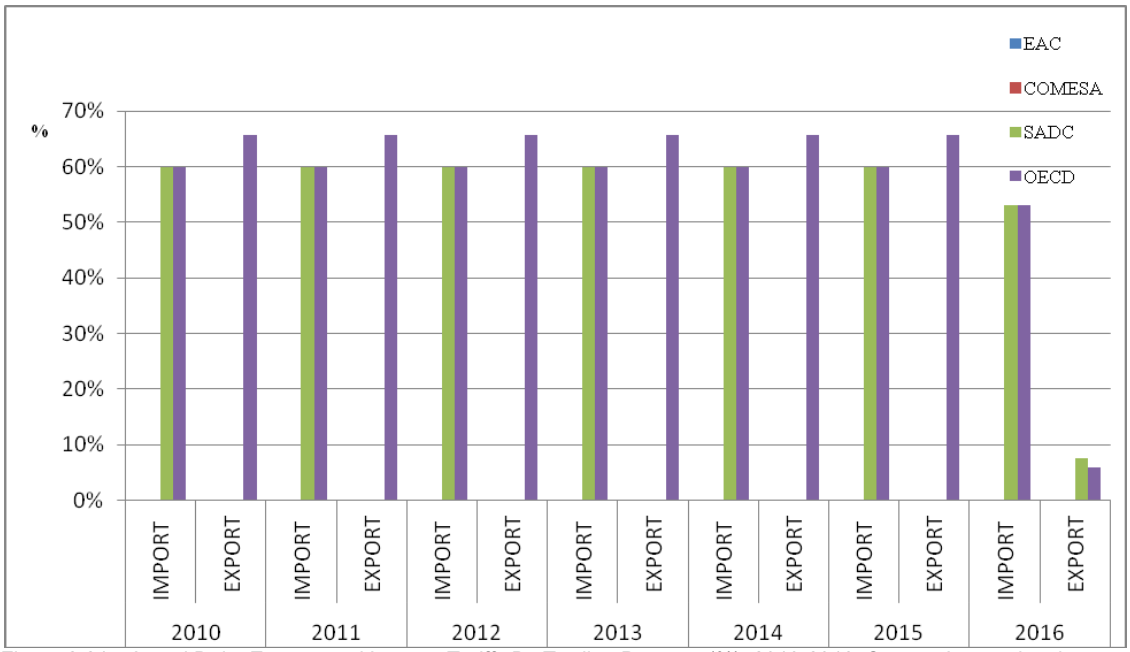
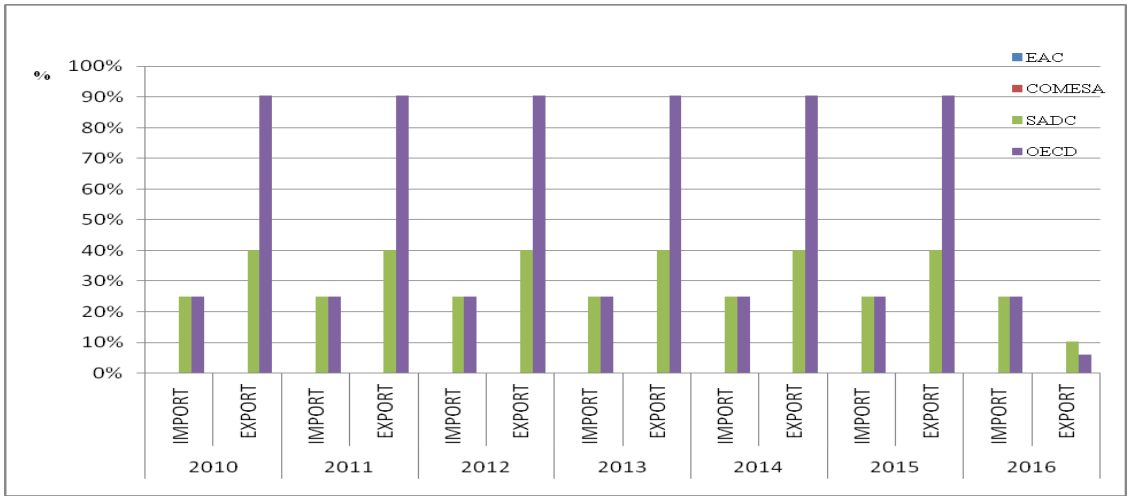


Figure 2.21: Actual Dairy Exports and Imports Tariffs By Trading Partners (%): 2010-2016. Source: International Trade Centre.

Figure 22 shows that OECD countries have been charging export duty on Kenya's processed beef of up to 90.5% while Kenya's imports of processed beef from these same countries is much lower at only 25%. This implies that market access of Kenya's processed beef to OECD is restricted due to these high tariff barriers. On the other hand, Kenya's imports of processed beef from EAC and



COMESA are zero rated clearly showing the benefits of regional integration. However, these import products attract duty of 60% if they come from SADC or OECD but there is hope that after the tripartite agreement between EAC, COMESA and SADC, the import duty on processed beef from SADC will be eliminated.

Figure 2.22: Actual Beef Exports and Imports Tariffs by Trading Partner (%): 2010-2016. Source: International Trade Centre.

Exports and imports of vegetables attract duty to SADC and to the OECD countries. Imports attract duty of 25% in these two trading destinations while exports to the SADC region attract duty of 15% while those to OECD have been attracting duty of 10% over the years. However in 2016 exports of vegetables to the OECD were zero rated but they attracted export duty of 14.24% as shown in Figure 23. From the foregoing, it is clear that there are tariff peaks in the three product groups: major food staples wheat and maize; vegetables; and the food industry (processed food products such as beef and dairy).

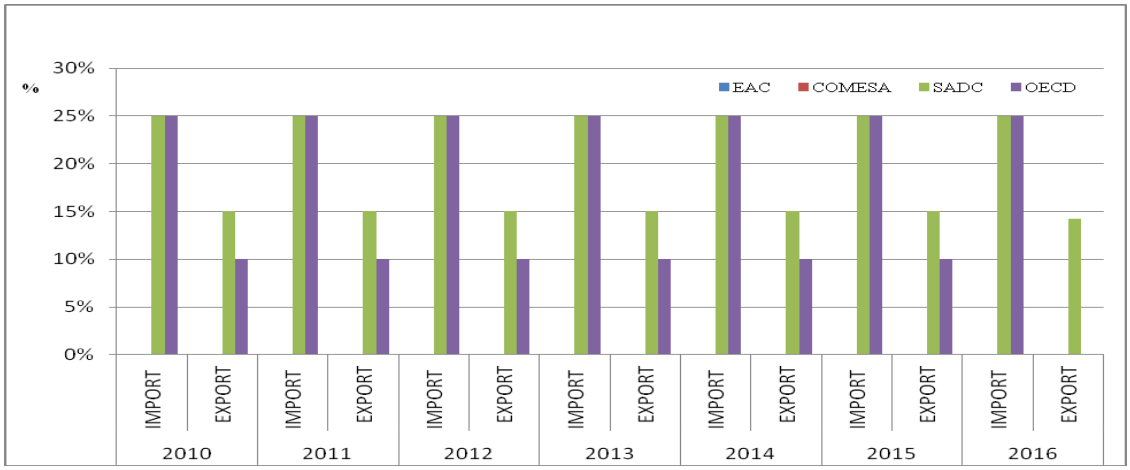


Figure 2.23: Actual Vegetables Exports and Imports Tariffs by Trading Partner (%): 2010-2016. Source: International Trade Centre.

2.8.2 Exports and Imports by Trade Destinations

The amount of exports and imports of Kenya's products depends on the destinations although for maize, there is more regional trade (EAC, COMESA and SADC) than to OECD countries. Kenya has generally been importing more cereals (maize and wheat) than it has been exporting these products. Figure 24 shows that Kenya has been importing more maize to these trading partners than it has been exporting to them. For example, Kenya's export of maize to these trading partners had been minimal but imports have been rising over the years mainly to meet domestic demand as maize is the main staple food. Imports have been coming from other EAC trading partners mainly Tanzania and also from the SADC region. Imports and exports of maize to the OECD have also been minimal.

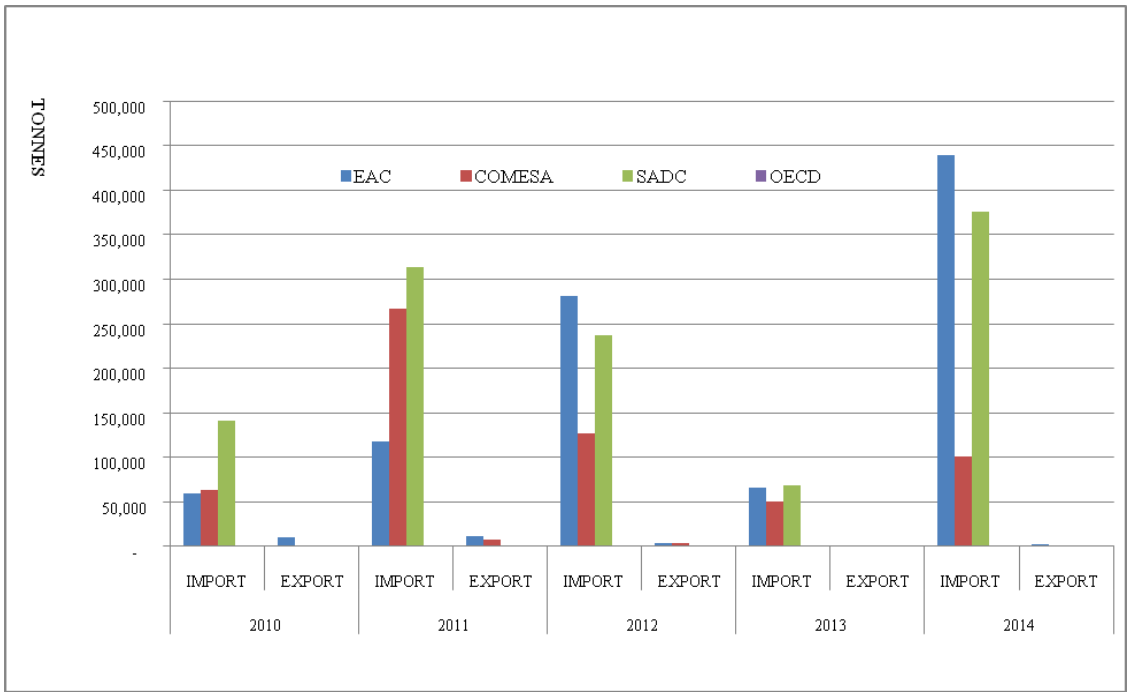


Figure 2.24: Maize Exports and Imports by Trade Destination (Tons): 2010-2014. Source: International Trade Centre.

On the other hand, Kenya is a net importer of wheat from the OECD countries as shown in Figure 25. Imports of wheat from the OECD have been rising 197,721 metric tons in 2010 to more than 450,000 metric tons in 2014. However, Kenya exports little amounts of wheat to the EAC and COMESA.

Figure 26 shows the amount of trade in dairy (exports and imports) between Kenya and its trading partners

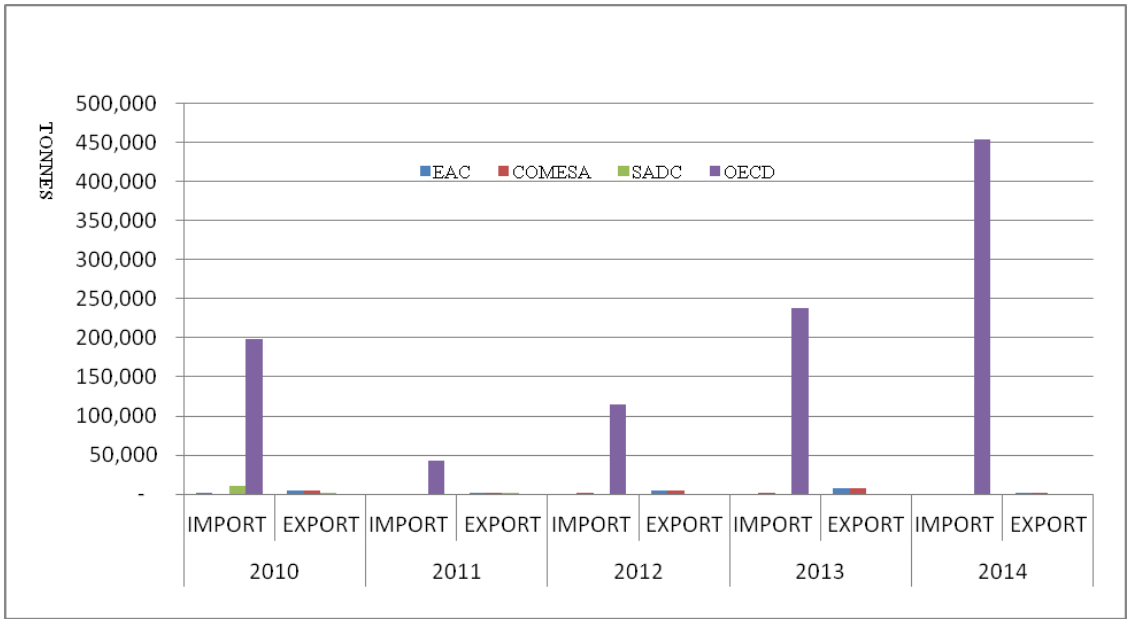


Figure 25: Wheat Exports and Imports by Trade Destination (Tons): 2010-2014. Source: International Trade Centre

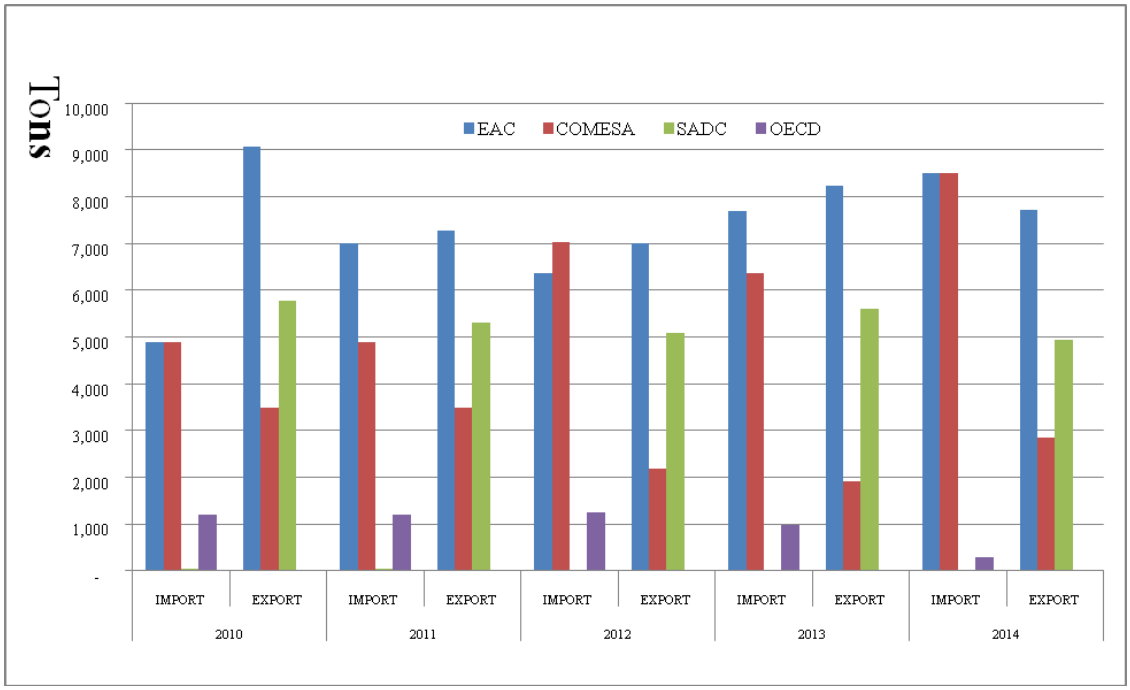


Figure 26: Dairy Exports and Imports by Trade Destinations (tons): 2010-2014. Source: International Trade Centre

Kenya exports to and also imports dairy products from its trading partners. Trade in dairy products has been more within the region and more so within the EAC than with the OECD countries. For example, in 2014, Kenya imported dairy products of more than 8,000 metric tons from EAC and COMESA and exported dairy products worth more than 7,000 metric tons from EAC.

Figure 27 shows Kenya's trade in beef products. It shows that Kenya exports most of its beef (mainly live animals) to the EAC and COMESA and it is only in 2012 that it managed to export substantial amounts of beef to the SADC region. However, Kenya has been importing mainly canned beef from the OECD countries.

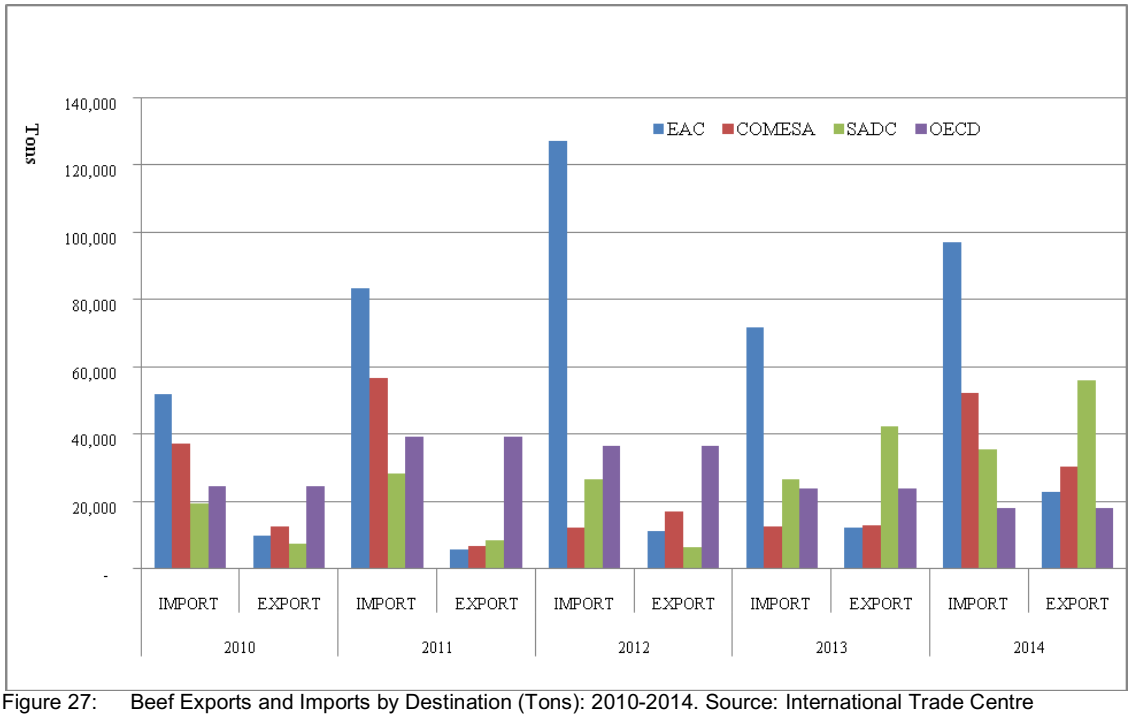


Figure 27: Beef Exports and Imports by Destination (Tons): 2010-2014. Source: International Trade Centre

2.8.3 Value of exports and imports by trade destination

Figure 28 shows the value of Kenya's maize imports and exports from its trading partners. It shows that the value of maize imports is far much greater than that of exports implying that Kenya has been operating a trade deficit in the maize trade. In 2010, 2011 and 2013 the value of maize imports from SADC was much more than that imported from EAC and COMESA. However, 2012 and 2014 were years when the value of maize imported from the EAC was higher than that from SADC and COMESA. On the other hand, the value of Kenya's maize exports to these regional markets was far much lower than the value of imports.

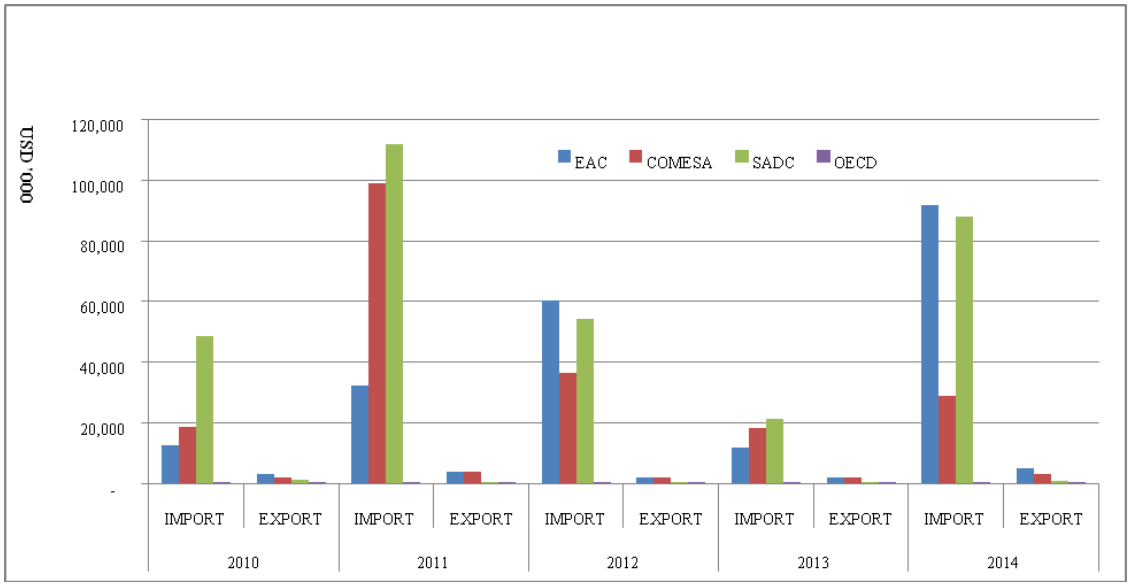


Figure 28: Value of Maize Exports and Imports by Trade Destination (US$ '000): 2010-2014. Source: International Trade Centre

Kenya also operated a trade deficit in its wheat trade as shown in Figure 29.

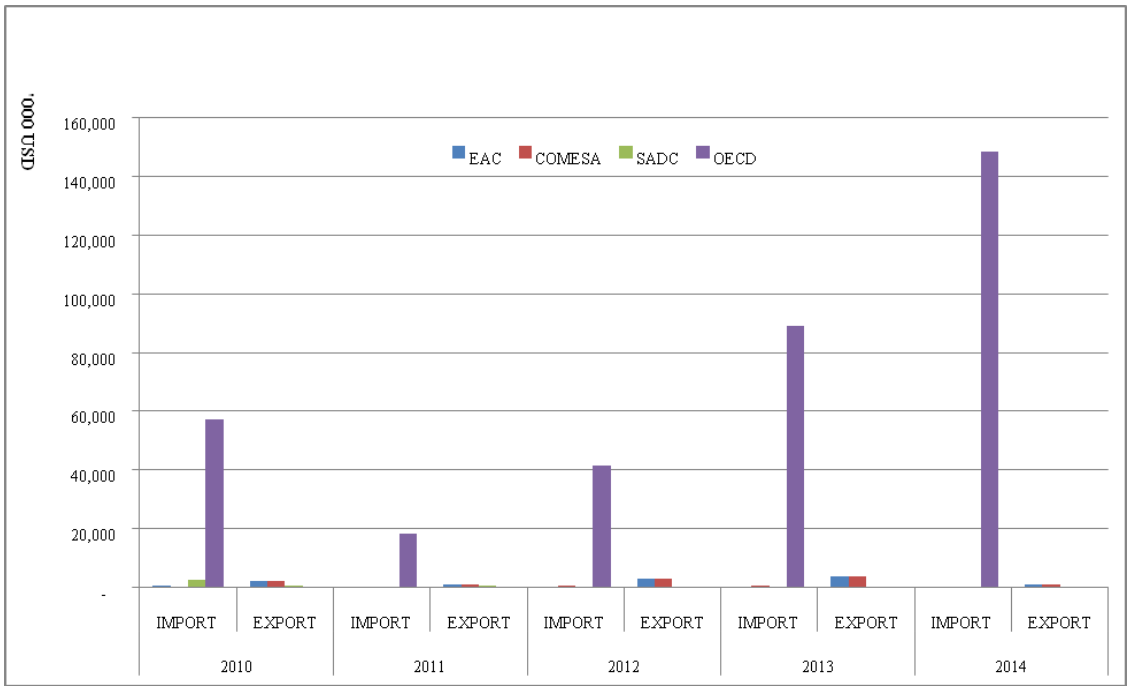


Figure 29: Value of Wheat Exports and Imports by Destination (US$ '000): 2010-2014. Source: International Trade Centre

From Figure 29, it is clear that Kenya's wheat imports from the OECD countries cost her dearly as the value of wheat imports mainly from OECD countries have been rising since 2011. The value of Kenya's wheat exports mainly to the EAC and COMESA is valued far much less than what it is paying the OECD countries and SADC for wheat imports.

Except in 2010 when Kenya ran a trade surplus from its trade in dairy products, it has been running a trade deficit over the years as the value of its dairy products imports is much higher than that of its exports as shown in Figure 30.

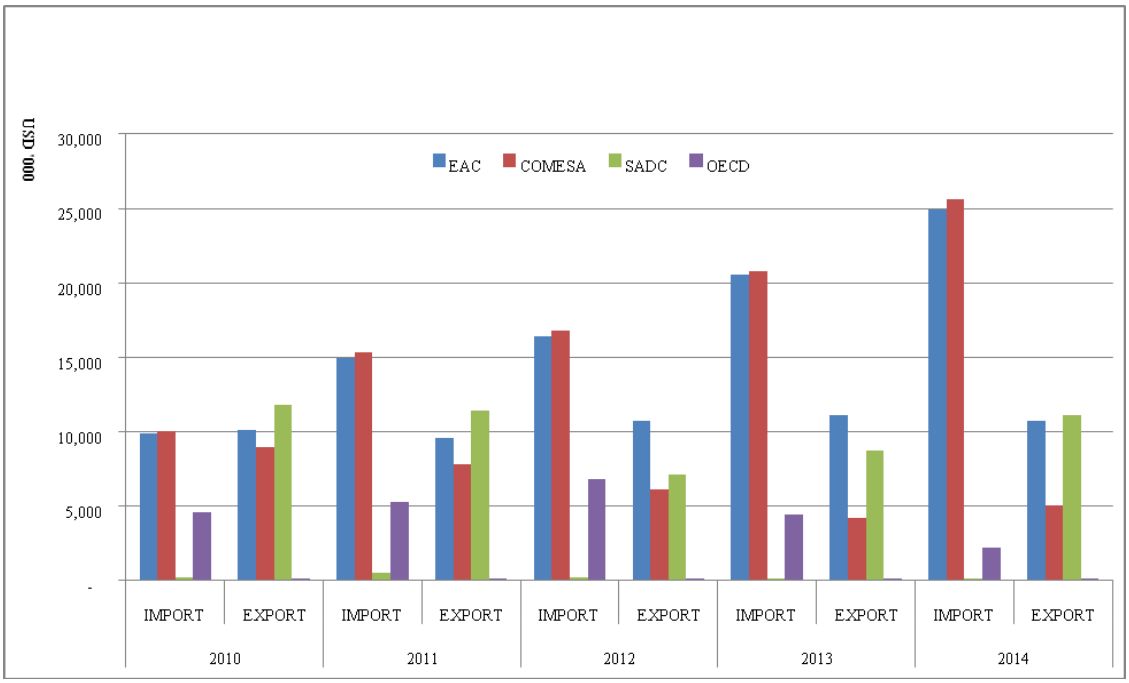


Figure 30: Value of Dairy Exports and Imports by Trade Destination (US$ '000): 2010-2014. Source: International Trade Centre

Kenya has been importing dairy products mainly from the EAC and a little from SADC and the OECD. On the other hand, it has been exporting dairy products to the EAC, COMESA and to SADC countries. However, the value of these imports is far much higher than the value of exports.

Kenya has been running a trade surplus in its beef trade with some countries. In 2010 and 2011, it had a bigger trade surplus in its beef trade with SADC compared with that from its trade with COMESA and the OECD. In 2012, 2013 and 2014 Kenya traded in beef with the EAC, COMESA, SADC and OECD. The value of Kenya's beef exports to the EAC was valued more highly than to the other trading partners as shown in Figure 31.

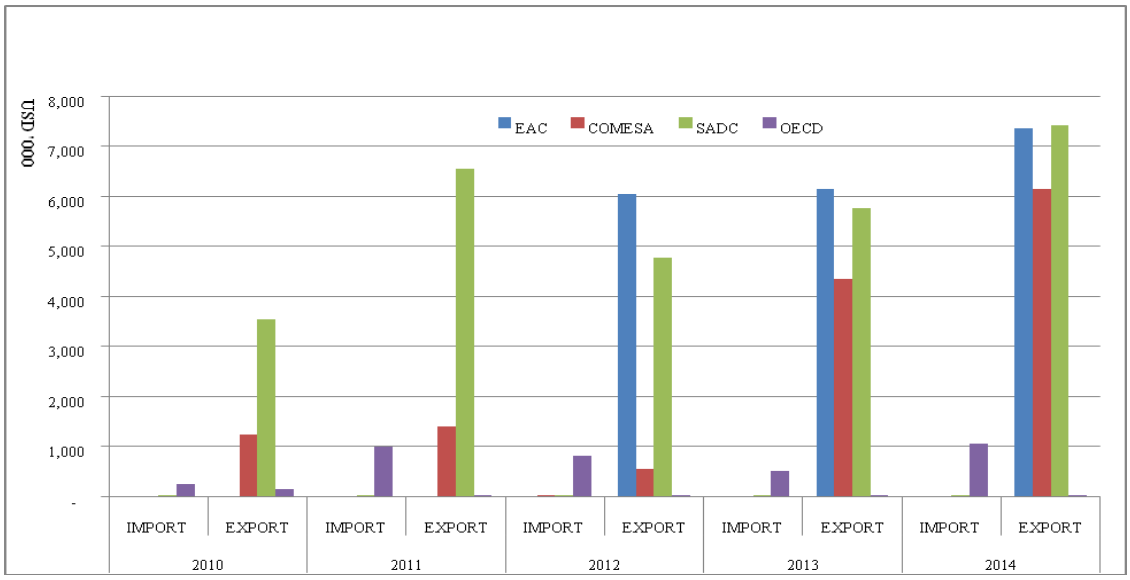


Figure 31: Value of Beef Exports and Imports by Trade Destination (US$ '000): 2010-2014. Source: International Trade Centre

Figure 32 shows the value of Kenya's exports and imports of vegetables by trade destination.

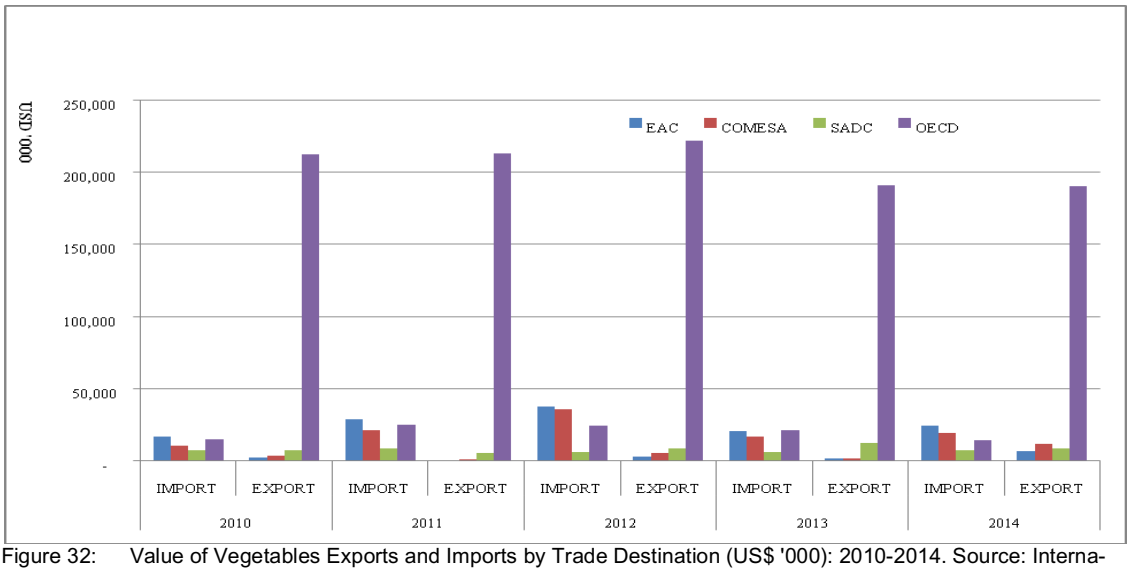


Figure 32: Value of Vegetables Exports and Imports by Trade Destination (US$ '000): 2010-2014. Source: International Trade Centre

Kenya's vegetables are more destined to the OECD than to the other trading partners. Kenya has been running a trade surplus in its vegetable trade even when it has been exporting and importing vegetables to the EAC, COMESA, SADC and to the OECD. The value of its vegetable exports to the OECD is much higher than the value of imports of vegetables to these countries.

2.9 Summary and Conclusion

Kenya's trade policy has evolved from an import substitution phase that was protectionist before and after independence up to the late 70 and early 80s. In 1984, Kenya adopted trade liberalisation, starting with the World Bank and IMF's Structural Adjustment Programs (SAPs). This championed privatisation that led to limitation of the role of the State in the economy, especially price and input controls, subsidies and trade in agricultural produce. This led to a focus on production for export, with cash crops prioritised over production of food for domestic consumption, with detrimental impact on national food security. The SAPs phase was followed by an export promotion phase where liberalization and production for export was emphasised. Trade liberalisation continued with Kenya joining the WTO in 1995 and joining WTO's Agreement on Agriculture (AoA). The Vision 2030 phase continued the export promotion emphasis but with subsidies in agricultural inputs especially fertilizer. A number of agricultural policies and strategies were introduced such as the ERS, the ASDS and SRA in order to increase agricultural production and more so to make Kenya food secure. However, even with these policies and strategies, Kenya remains a net food importer especially maize and wheat and the value of its exports are much lower than that of its imports hence operating trade deficits in these products. However, it has been operating a trade surplus in vegetables and beef. It is important to note that beef and vegetables are mainly produced by large scale farmers while maize is mainly produced by small scale farmers. Wheat is also produced by large scale farmers but a few small scale farmers also try to produce some for household consumption. Kenya has signed various trade agreements which are either multilateral or bilateral. It belongs to various regional trade blocks such as EAC, COMESA, and to the Tripartite Agreement between the three regional trading blocs of EAC, COMESA and SADC. It also belongs to IGAD and already signed the EPA and has trading arrangements with OECD and AGOA.

Kenya's imports more from the OECD than it exports due to stringent conditions (non-tariff barriers) in terms of Technical Barriers to Trade (TBT) and Sanitary and Phytosanitary Measures (SPS). These are discussed in detail in chapter 4. On the other hand, Kenya operates both deficits and surpluses in its trade with the EAC, COMESA and SADC.

The Agreement on Agriculture has not substantively increased market access for Kenya in developed countries especially to the OECD as might have been expected due to high non-tariff barriers (see chapter Four) that have been maintained by these States. It has, however, opened up Kenya's food market to cheap subsidised food products from developed states, with detrimental impact on agricultural production by smallholder farmers who are unable to compete due to the distorted market. Declining production means declining income and opportunities of employment for the most food insecure – smallholder farmers and farm labourers – with the effect that food poverty, general poverty and inequality has increased as a result of liberalization in trade in agricultural produce. The 2010 Constitution has sought to change the narrative, entrenching an expansive Bill of Rights[9], which it affirms as the basis of all economic policies. This means that trade laws, policies and agreements must take into account the fundamental rights in the Bill of Rights. The State must thus take into account the fundamental rights of the Kenyan people in its adoption of national trade policies as well as in joining international agreements – to ensure that these policies and agreements do not negatively impact on the fundamental rights of Kenyans, especially their economic and social rights like the right to food, the right to water, human dignity and the need to provide special protection for vulnerable groups such as the food poor smallholder farmers and farm labourers. This means therefore, that even as Kenya maintains its commitment to trade liberalization, it should do so with caution taking into consideration the rights of the citizens and that is why when circumstances dictate that import tariffs should be removed to address issues of food

[9] Article 43 (1c) in the 2010 Constitution is on the Right to Food for every Kenyan

security, the Kenya Government has not been hesitant to do this. It has also been using fertilizer subsidies to help the small scale farmers increase food production. Price subsidies on essentials such as maize flour, social protection schemes for the poor and vulnerable in the form of food subsidies, monthly stipends, 30% public procurement preference and reservation for women, youth and persons living with disabilities are all meant to make sure that even as Kenya adopts trade liberalization, the fundamental rights of citizens on the right to food are not ignored.

3 Government involvement in food processing industry

3.1 Introduction

This component of the food systems trade study examines how economic regimes impact on the food systems by specifically focusing on government involvement in the food processing industry in Kenya. We analyze agricultural policy with respect to five food items spanning three food systems namely: local food system (maize); national food system (wheat, dairy, beef); and international food system (vegetables). In particular, we seek to address two key questions: whether the government supports sourcing of domestic products by the processing industry and in which form; and whether the government has programs supporting the processing of these products, to what extent and in which form. The discussion will revolve around the challenges and impediments to food systems with respect to sourcing and processing in terms of what is done and what is lacking.

Agriculture remains a backbone of Kenya's economy. It accounts for more than 25% of the gross domestic product (GDP), , 65% of exports, 60% of foreign exchange earnings and employs 75% labour force (D'Alessandro et al., 2015; Alila and Atieno, 2006a). Over 80% of Kenyans, mostly pastoralists, subsistence farmers and the landless live in the rural areas, directly or indirectly making a livelihood from agriculture (Alila and Atieno, 2006a). This underscores the vital role of agriculture in economic growth, food security, and poverty reduction (Republic of Kenya, 2009). Indeed, food security of any country is naturally closely tied to food production (Prášková, 2013). Besides ensuring food security and nutrition for all Kenyans, the agricultural sector is also expected to generate income and employment especially in the rural areas (Republic of Kenya, 2009). The agricultural sector plays a key role in the food system more specifically in production, processing and consumption. Consequently, the policy framework, governance and economics of food production and processing have important implications on food security and its sustainability.

Alila and Atieno (2006a) note that coffee, tea, dairy, maize, wheat, beef, and horticulture provide livelihoods for over 85% of the population, while coffee and tea alone provide 45% of wage employment in agriculture. Kenya's small-scale agricultural production accounts for 75% of the total agricultural output and 70% of marketed agricultural produce (Republic of Kenya, 2009). Small scale farmers produce over 70% of maize, 65% of coffee, 50% of tea, 80% of milk, 85% of fish and 70% beef and related products. On the other hand large-scale farming accounts for 30% of marketed agricultural produce mainly involving the growing of crops such as tea, coffee, maize and wheat in addition to keeping livestock for commercial purposes. Smallholder farmers produce 80 % of the milk, which is exported both formally and informally, mainly to Uganda, Tanzania and Rwanda (Prášková, 2013). Kenya is not self-sufficient in beef production, 80% of which comes from pastoralists, either directly in Kenya or in neighbouring countries (Prášková, 2013). Kenya also produces exotic fruits and vegetables, whose main target markets include Great Britain, France, the Netherlands and Spain. Following Kenya's implementation of higher standards for export products, the share of smallholder farmers in the production of fruits and vegetables fell from 60% in 2004 to 30% by 2011 (Prášková, 2013).

Republic of Kenya (2009) notes that production of maize, wheat and rice has generally been below the country's consumption requirements. Maize is the main staple for up to 90% of Kenyans. However, the local production of maize, wheat and rice does not cover domestic consumption needs necessitating imports mainly from Malawi, Zambia and Tanzania (maize), Russia, Pakistan and Brazil (wheat) and Pakistan, India and Vietnam (rice) (Prášková, 2013). Consequently, Food and Agriculture Organization (FAO) rates Kenya a Net-Food Importing Developing Country (NFIDC) (Prášková, 2013). This

underscores the fragile food security status of the majority of Kenyans and the importance of agricultural trade for the country.

The goal of policies and legislations guiding the agricultural sector in Kenya is to promote food security and incomes; advance agro-based industries, employment creation and agricultural exports; and enhance sustainable use of land resources as a basis for agriculture enterprises (Republic of Kenya, 2015a).

The rest of this section is organized as follows. Section 3.1 examines the agricultural policy framework in general and also with respect to assessed products. Section 3.2 focuses on government involvement in sourcing and processing with respect to assessed products while section 3.3 presents the challenges and opportunities together with a discussion on the way forward.

3.2 Kenya's Agricultural Policy Framework

The agricultural policy in the post-independence period (1963-1980s) was implemented through direct government intervention. The government set farm-gate and consumer prices for all basic agricultural commodities such as maize, maize meal, sugarcane, sugar, wheat grains, wheat flour, bread, milk and milk products. This was intensified by the creation of production and marketing parastatals and boards, and promotion of farmer cooperative societies. During this period, the government invested heavily in productive infrastructure such as large irrigation schemes and rural roads. The main policy objective was to achieve food self-sufficiency. However, despite the growth achieved in the sector, the period was characterized by poor governance in parastatals, indebtedness and poor services to farmers, as well as monopolized market structures that led to price inefficiencies" (MAFAP, 2013, pp39; Gitau et al., 2008). For example, in the dairy sector, the government introduced highly subsidized production and marketing services such as artificial insemination, dipping and other veterinary disease-control services. In addition, contract and quota systems of milk delivery to Kenya Cooperative Creameries (KCC), which were not favourable to smallholder dairying, were abolished and the government engaged in deliberate intervention through the promotion of collective action among smallholders into membership in cooperative societies. This was a deliberate move by the government to increase participation and develop smallholder dairy subsector (Sourcewatch, 2012). In post-independence Kenya, the government used KCC, cooperative societies and its own veterinary and livestock production departments to facilitate the growth of the smallholder dairy subsector (Sourcewatch, 2012).

Prior to the implementation of the Structural Adjustment Programs (SAP) in mid 1980s, the government used to control maize grain movement, regulate maize meal prices and granted a direct subsidy on maize sold to registered millers. These measures were undertaken by parastatals (mainly, National Cereals and Produce Board (NCPB) and designed to assist low-income consumers access food affordably (Nyoro et al., 2007). Before 1992, the dairy industry was controlled by government, which gave policy guidelines, set prices, determined the players in the industry and set the market rules. The Kenya Cooperative Creameries (KCC) was a monopoly marketing and processing milk and dairy products (Monitoring African Food and Agricultural Policies (MAFAP), 2013). In the 1980s, weaknesses of parastatals became pervasive due to absent market efficiency discipline (not profit-driven), susceptibility to political interference, corruption, and lack of technical and marketing innovation (Nyoro et al., 2007).

The first evidence of concern for food security in Kenya was echoed in the Sessional Paper No. 4 of 1981 on the National Food Policy (NFP). The NFP sought to maintain a position of broad self-sufficiency in the major foodstuffs and ensure equitable distribution of food of nutritional value to all citizens. This was to be achived mostly through government interventions, such as setting of grain prices, state monopoly of inputs distribution and across the board fertilizer subsidy. The Policy aimed at achieving broad self-sufficiency in the main foodstuffs while reducing food imports and ensuring that the foodstuffs are distributed in such a manner that every member of the population has nutritionally adequate diet (Nyoro et al., 2007). To realize the NFP objectives, the government pursued commodity price controls to cushion producers and consumers from unstable global grain markets. Consumer prices were generally set at levels which covered the domestic producer prices plus processing and distribution costs. Grain marketing was monopolized by the NCPB, whose responsibility was to regulate and control the collection, movement, storage, sale, purchase, transportation, marketing, processing, distribution, importation, exportation, disposal and supply of maize, wheat and scheduled agricultural produce (Nyoro et al., 2007).

In the early 1990s, Kenya embarked on structural and macroeconomic reforms. The most important reform was the implementation of the market liberalization. This involved the removal of price controls in the product and input markets, dismantling of trade restrictions and transfer of commercial functions from the public to the private sector (Nyoro et al., 2007). The liberalization period was characterized by the implementation of the Structural Adjustment Programs (SAPs) and “free market” policies. The SAPs included privatization and deregulation of the sector, reduction in trade barriers, exchange rate adjustments and an increase in decentralization (MAFAP, 2013). Maize marketing and price controls together with the subsidies were eliminated in December 1993 and in wheat market, millers and traders were allowed to compete with the NCPB. NCPB’s role was reduced from a sole trader to an agency buying maize for the purpose of building national strategic reserves and later to being buyer and seller of last resort (Nyoro et al., 2007).

In the dairy sector, implementation of the Structural Adjustment Programs (SAPs) entailed cost sharing. Gradually farmers paid part of the price for veterinary drugs in 1988; 1989 saw price liberalization for animal feeds and management of cattle dips was transferred to community groups; artificial insemination services were privatized in 1991; milk prices were deregulated and dairy sector liberalized in 1992; and veterinary clinical services were privatized in 1994 (Sourcewatch, 2012; Republic of Kenya, 2013; Atieno and Kanyinga, 2008). With the progressive liberalization of the dairy industry and cut back in public breeding and health, many farmers were no longer able to access important inputs and services. Private processors who purchased milk directly from farmers and informal milk traders rapidly gained access to the dairy market (Sourcewatch, 2012; Atieno and Kanyinga, 2008). As a result, KCC could no longer control dairy prices and minimum producer prices could no longer be guaranteed (Atieno and Kanyinga, 2008).

Needless to say the cutback on input subsidies, entry of private traders and KCC’s inability to guarantee producer prices compromised output, incomes and food security especially for small scale farmers. During this period the government’s policy was to: phase out government interventions; maintain self-sufficiency in milk and dairy products; allow for smooth transition from government interventionism to a free market; and create a conducive environment for milk production and marketing (Sourcewatch, 2012). Liberalization also brought about changes in procurement, handling and marketing of milk and dairy products, including the admittance of new players into a dairy market previously controlled by KCC.

The liberalization policy led to collapse of some government institutions due to inefficiencies in a liberalized market and poor governance, coupled with a private sector that had neither the capacity nor the incentives to take on the role the government had abandoned with consequent poor performance of the sector. A case in point was the dairy industry. The Dairy Development Policy of 1993 allowed the government a smooth exit from services they supported while intensifying the dairy production systems and opening up milk processing to new investors (Republic of Kenya, 2013). However, KCC failed to thrive in a liberalized environment due to political interference and poor management and went bankrupt by 1999. The dairy industry suffered a credibility crisis after the collapse of KCC together with some private processors. The Dairy Development Policy of 1993 was therefore unable to address the challenges of liberalization while the private sector failed to cater for support services and the supply of inputs, including breeding, veterinary clinical and credit services. This lead to a dismal performance of the sector in terms of production, processing and marketing (Republic of Kenya, 2013). By 2000, prices of almost all commodities were liberalized, with some specific government interventions, mainly through international trade protection (MAFAP, 2013).

To reflect the realities of liberalization, Sessional Paper No. 2 of 1994 on National Food Policy deregulated the cereal pricing and allowed both the private and public sector to import food whenever necessary. To protect domestic producers, food imports were subject to variable import duty and food exports could be allowed only when domestic supplies were sufficient and in keeping with the inter-regional and international trade agreements. The policy also advocated for need to protect the interests of farming communities (Nyoro et al., 2007) as well as safeguard the food security status of the country.

Governments ought to strive for policy coherence through systematic promotion of mutually reinforcing policies that create synergies in achieving agreed objectives. A coherent agricultural policy safeguards against negative spill-overs in other policy areas that would affect development prospects (Brooks, 2014). Since 2000, Kenya has been very dynamic in reforming and consolidating policies for a post-liberalization period, and may be considered to be moving towards policy coherence. This started with the development of a national strategy for economic recovery (Government of Kenya, 2003), following the economic crisis of the late-1990s to early-2000s. Following a largely consultative stakeholder participatory approach processes a number of new or reformed policies, which conformed to the country´s recent strategies were developed (MAFAP, 2013). For example, KCC was re-nationalized and renamed 'New KCC' in June 2003, following Kibaki's government reforms and initiatives to bring KCC back into public ownership and revitalize the industry (Atieno and Kanyinga, 2008). The reforms, hailed as a major success, saw a dramatic revival of the KCC and the dairy sector in general. The fortunes of smallholder diary producers rose due to increased competition and better farm-gate prices (Atieno and Kanyinga, 2008). This is a clear indication that policy, institutional support and strengthening, combined with the political good will are key ingredients in ensuring and sustaining food security and maintaining synergy between the local, national and international food systems.

The 2003 Economic Recovery Strategy (ERS) afforded agriculture high prominence and priority, recognizing that it had to grow even faster to restore the economy on the growth path by creating wealth and employment (Republic of Kenya, 2003). Through the ERS, the government proposed to strengthen the farmer based institutions and associations to improve access to markets, as well as establishing effective and sustainable guaranteed minimum returns for strategic crops (Nyoro et al., 2007). In 2004, the Strategy for Revitalizing Agriculture (SRA) was launched as a follow-up and response to ERS (Republic of Kenya, 2009). On expiry of ERS implementation in 2007/08, Kenya Vision 2030 was launched in June 2008 as a long-term development blueprint for the country. The Vision

recognizes agriculture as a key sector to deliver the 10% annual economic growth rate envisaged under the economic pillar (Republic of Kenya, 2007).

The Government of Kenya launched the SRA in March 2004, to provide specific framework for the implementation of the ERS in the agriculture sector (MAFAP, 2013; Alila and Atieno, 2006a). This was part of the broader development framework of the Economic Recovery Strategy (ERS). The SRA was a 10-year agricultural policy framework implemented under the Medium-Term Expenditure Framework budgetary process, structured around three-year rolling plans (Alila and Atieno, 2006b). An inter-ministerial Agricultural Sector Coordination Unit (ASCU) was charged with implementing the SRA (Alila and Atieno, 2006a). The SRA aimed to provide a policy and institutional environment conducive to increasing agricultural productivity, promoting investment, and encouraging private sector involvement in agricultural enterprises and agribusiness. Achieving this needed a legal and regulatory framework that is fair to all farmers, producers, processors and marketers of agro-products (Alila and Atieno, 2006a). In addition the SRA had the overall objective of raising household incomes, create employment and ensure food and nutrition security. The SRA focused on a number of key action areas in order to eliminate extreme poverty and hunger in line with the United Nation's Millennium goals (MDG). The key areas were creation of enabling environment through policy reforms, increasing productivity to the food-insecure farmers, improving nutrition for the chronically hungry and, increasing incomes and making markets work for the poor (Nyoro et al., 2007).

In line with SRA, institutions that were on the verge of collapse such as KMC, the KCC, the KSC, AFC, and ADC were revived. Two major roles for the government considered in the SRA were providing a limited number of goods and services, and a reduced range of regulatory functions that cannot be enforced by private self-regulation (MAFAP, 2013). To this end agricultural price policies supporting the producers were characterized by a strong Government presence and control of produce and input prices (MAFAP, 2013). A prominent example of the policies is price stabilization and producer support prices for maize, through: increasing imports by the NCPBfor the strategic grain reserve; supply of maize to millers at fixed prices in 2008; fixing the purchasing price of maize; and input subsidies on a continuous basis, mainly for fertilizer, in the form of direct payment to farmers or free distribution (MAFAP, 2013).

Republic of Kenya (2009) reported that SRA saw agriculture grow at 6.4% in 2006 way above the targeted 5% by 2007. Other achievements included reduction of food insecurity and poverty by over 12% and 10% respectively from 2003 to 2007. In addition, productivity of key commodities (tea, maize, sugar, horticulture, milk and meat) each increased by an average of over 6% per annum during the same period together with the revival of most agricultural institutions.

The Agricultural Sector Development Strategy (ASDS) 2009-2020 is a revision of the Strategy for Revitalizing Agriculture (SRA) of 2004. The ASDS 2009-2020 targets to reduce those living below poverty line to less than 25% and reduce food insecurity by 30% among others, thereby contribution to MDGs and Vision 2030 goals (Republic of Kenya, 2009). These achievements would require government divesture from production, processing and marketing functions to private sector as well as reforms and streamlining of agricultural institutions and support service delivery (Republic of Kenya, 2009). Republic of Kenya (2009) acknowledges the central role of the private sector in the agriculture sector, stating that much of the work, such as production, processing, marketing, value addition and financing, is done by the private sector. It observes that sub-sectors such as horticulture where government has little involvement are resilient to external shocks and have been growing rapidly, together with those that are liberalized (Republic of Kenya, 2009). These observations underscore the fact that

the government has an important role of creating an enabling environment for the private sector participation to not only meet its food security, poverty reduction and income growth objectives but also enhance resilience of agricultural sector to external shocks. For example, to mitigate food insecurity during the first half of 2017 when Kenya experienced drought and attack of maize by army worms, the government initiated a food subsidy program. In the program a 2kg flour packet retailed at KES 90 together with a duty waiver window on maize imports to allow private sector imports to meet the millers deficit requirements.

It is worth noting that in addition to the policies and strategies reviewed above, there are other several relevant national policies and legislations guiding the crops sub-sector in Kenya. They include: National Food and Nutrition Security Policy, 2012; National Agriculture Sector Extension Policy, 2012; National Agri-Business Strategy, 2012; National Horticulture Policy, 2012; National Root and Tuber Crops Policy, 2011; Kenya Seed Policy, 2010; and several relevant Acts of Parliament (Republic of Kenya, 2015a). Similarly, the livestock sub-sector is guided by National Livestock Policy (NLP), National Dairy Development Policy (NDDP); National Poultry Policy (NPP) and several Acts of Parliament (Republic of Kenya, 2015a).

3.3 Government Involvement in Sourcing and Processing

This section assessed government involvement in sourcing and procession of maize, wheat, dairy beef and vegetables. Available literature shows that government involvement in sourcing and processing of the assessed products varies, with substantial involvement in crops like maize and wheat to minimal involvement in horticultural crops like vegetables. Furthermore, the involvement is largely in form of providing the policy guidance and providing conducive legal and regulatory environment within which the sub-sectors operate. So far the government has developed a number of flagship projects for the agricultural and livestock sector. They include: preparation and passage of consolidated agricultural policy reform legislation; development and implementation of a 3-tiered fertilizer cost reduction program; improving value addition in the production and supply chain through branding Kenyan farm products; and planning and implementation of disease-free zones and livestock processing facilities to enable Kenyan meat, hides and skins meet international marketing standards (Bergevoet and Van Engelen, 2014). Agri-Business Development Program (ABDP), another agriculture flagship project, is geared towards: improving access to markets by all agricultural value chain players as well as improving and modernizing market facilities; transforming agricultural marketing functions through value chain development and strengthening producer and marketing systems; and creation of local, regional and international marketing opportunities for agricultural commodities (Republic of Kenya, 2015a).

To address issues along the entire value chain of agricultural exports for improvement of agribusiness and market access, the government stated policy was to: collect, collate and disseminate information on the domestic and international markets to producers, exporters and service providers; support and empower farmer organizations to play their role in providing market support services; and work with relevant stakeholders to ensure that agricultural products meet international quality and safety standards compliance process (Republic of Kenya, 2009).

The GOK in collaboration with Development Partners, through the relevant ministries also supports agricultural and economic development through implementation of various initiatives designed in form of projects and programs (Republic of Kenya, 2015b). The projects and programs aim for achievement of food security, increasing agricultural productivity, employment creation, income generation and,

poverty reduction. Appendix A2 presents selected projects and programs, especially those with relevance to the five commodities of interest in this study. These projects and programs are evidence of government involvement in supporting production and marketing of agricultural produce.

In Kenya, agricultural cooperatives constituting 46% of cooperative societies in the country play an important role in procurement of inputs, production, value addition and marketing (Republic of Kenya, 2009). These are member-owned and operated organizations with the Ministry of Cooperative Development and Marketing providing the necessary legal and regulatory environment. They have been instrumental in bulking; processing and transporting of produce on behalf of the members; and also play an important role in the provision of credit and supply of farm inputs. In sub-sections 3.2.1 to 3.2.5, we examine government involvement in sourcing and processing of maize, wheat, dairy, beef and vegetables respectively.

3.3.1 Maize

The Kenyan maize industry is well developed. A number of state and parastatal organizations are active in the maize industry such as National Cereals and Produce Board (NCPB) and Kenya Seed Company (KSC), among others (Bergevoet and Van Engelen, 2014). In 1979, the NCPB (a government board) replaced the Maize and Produce Board and the Wheat Board of Kenya and was vested with the authority of all aspects of maize and wheat marketing (Monroy et al., 2013). The NCPB had monopoly powers to purchase, store, market and generally manage cereal grains and other produce in Kenya. It was empowered to regulate and control the collection, movement, storage, sale, purchase, transportation, marketing, processing, distribution, import, export, and supply of maize, wheat and other scheduled agricultural produce under a controlled price system (Monroy et al., 2013). Prices were set each year at each level in the value chain whereby the NCPB bought from farmers and sold to millers at administratively determined prices, while wholesale and retail prices for flour and bread were set by the Office of the Price Controller of the Treasury (Monroy et al., 2013). Before liberalization in 1989 NCPB set fixed selling prices whereby industrial millers were the primary buyers and would legally acquire maize only from the NCPB. During this time partial controls on private transport of maize across district boundaries enabled the NCPB to garner most of farmers' surplus maize. These restrictions were progressively lifted in the 1990s (Jayne et al., 2005). Elimination of these controls in 1995 necessitated NCPB to set official producer prices typically higher than market prices during the post-harvest months in order to acquire adequate maize from farmers (Jayne et al., 2005).

For nearly three decades since independence, Kenya operated two parallel maize marketing systems. From 1988 the government partially liberalized the maize market by allowing unregulated private trade in maize within the country at prices determined by market forces (Jayne et al., 2005). Private maize trade that occurred prior was suppressed by controls on inter-district trade. The second was the official marketing system through the NCPB, a parastatal that purchased and sold maize at prices set by government. NCPB received annual financing in the 1980s to mid-1990s to purchase between 3 and 6 million bags of maize per year (Jayne et al., 2005). By 1993, the market was fully liberalized gradually reducing the monopoly powers of NCPB and private sector imports and domestic marketing were permitted.

While the NCPB procures and sells maize at administratively determined prices, private sector marketing channel competes with the NCPB and prices in the private sector are set primarily by the market forces of supply and demand. However, NCPB has the mandate of stabilizing prices, maintaining strategic reserves and purchasing maize for relief purposes. The Government also undertakes ad hoc export bans when the country anticipates poor harvest or maize deficits (Nyoro et al., 2007). The

NCPB is now a publicly owned commercial agency that purchases grains for strategic reserves and monitors trade in cereals (Monroy et al., 2013). As stated in Daily Nation (2016), large scale maize-millers source maize from NCPB and mill 35% of maize for consumption. The rest is milled by small scale County based millers. NCPB has different grades of maize, some suitable for human consumption and others for animal feeds (Daily Nation, 2016).

The major short- and medium-term policy objective for maize is maintaining availability at stable, affordable prices for Kenyan consumers, with the NCPB being the main implementing agency. The Government occasionally responds to low prices with higher tariffs, although market interventions have focused on maintaining supplies, especially in the major deficit market of Nairobi (MAFAP, 2013). Kenyan policy makers are confronted by what Jayne et al. (2005) refer to as the classic "food price dilemma" of ensuring adequate returns for domestic maize production while keeping costs as low as possible for consumers. While majority of rural livelihoods depend on the viability of maize production as a commercial crop, food security of the growing urban population and many rural households who are buyers of maize depends on keeping maize prices at tolerable levels. The Jayne et al. (2005) study shows that benefits derived from restricting maize imports are enjoyed by a relatively small proportion of rural small farmers as majority are net maize buyers, and the proportions are much higher than previously thought even in traditional maize producing regions of the country. Households resort to using the income derived from their non-farm and cash crop activities to buy much of their food requirements because of insufficient domestic production. In this scenario, policy debates have revolved around appropriateness of trade barriers and the role of government in ensuring adequate returns to maize production (Jayne et al., 2005), while the overall situation spells dire implications on the food security situation of Kenyans especially due to high levels of poverty. This leads to the observation that while restricting maize imports may benefit the local food system at production level by raising producer prices, the national food system in relation to consumers may be compromised as they face higher prices.

Kenya's national maize production has over time been outstripped by consumption driven mainly by population growth. Maize production peaked during the mid- to late-1980s but stagnated thereafter. Between 1990/91 and 2002/03 maize production averaged 2.4 million tons per year (Jayne et al., 2005). Republic of Kenya (2016) reported that maize production declined from 42.5 million bags in 2015 to 37.1 million bags in 2016 leading to a shortage that has seen the price of maize flour skyrocket. To bridge the growing gap between demand and supply, Kenya has imported maize both formally and informally mainly from Uganda and Tanzania, South Africa, Malawi, United States of America and other Southern America countries like Brazil and Argentina (Nyoro et al, 1999; Jayne et al., 2005). Indeed, in the early 1990s, Kenya transitioned from a net exporter to net importer in official maize trade, although the imports could be underestimated due to unrecorded informal trade inflows from Uganda and Tanzania (Jayne et al., 2005). However, there is renewed interest in promoting domestic maize production by subsidizing fertilizer through the NCPB. In addition there is a new system of guarantees that allows farmers to store their maize in NCPB depots and sell it later in the year when prices are higher including support for irrigation as part of an economic stimulus package (MAFAP, 2013).

The government has pursued its maize pricing and income transfer policies through the activities of the NCPB, which procures and sells at administratively determined prices. The government also imposes restrictions on external maize trade through a variable maize import tariff (Jayne et al., 2005). However, imported maize has apparently been cheaper than that domestically produced which has necessitated the government to often resort to maize import tariffs and regulatory barriers to restrict

maize inflows (Jayne et al., 2005). Nyoro et al., (2007) observes that by absorbing much of the surplus maize off the market, the NCPB's operations affect parallel market prices. For example, Jayne et al. (2005) note that one-third of the maize purchased by the NCPB since the 1995/96 season had not been sold domestically. Some of this maize appeared to have been exported officially while some was sold to donors for drought relief operations. By taking more maize off the domestic market than injecting into it through sales, the NCPB is likely to have put upward pressure on wholesale maize market prices. While this may benefit a few large scale farmers (national food system), it may hurt most small scale farmers (local food system) who are net buyers of maize (Nyoro et al., 2007) and majority of producers.

This section reveals that over the years government involvement in sourcing and processing of maize has gradually reduced especially with the onset of liberalization. Although the private sector is currently largely involved in purchasing and procession of maize, the governemt retains its role in maintaining strategic reserves and policy formulation and guidance.

3.3.2 Wheat

Wheat is grown in the highlands around Mount Kenya, Aberdares, the Rift Valley and Narok County (Bergevoet and Van Engelen, 2014). Wheat is the second most important grain after maize in terms of both production and consumption and the second most important agricultural commodity in Kenya from a food security view point (Monroy et al., 2013; Nyoro et al., 2007). The crop is grown largely for commercial purposes on a large scale (Nyoro et al., 2007). Several studies cited in Monroy at al., (2013) show that over time large and medium scale farmers have dominated Kenya's wheat production, using capital intensive technology with large scale farmers accounting for 80% of output. Kenya's wheat farmers are entirely dependent on local millers as the only market for their produce. There has been an increase in demand for wheat arising from changing consumption habits as well as the export of wheat products to the neighbouring countries within the COMESA region (Nyoro et al., 2007).

Wheat consumption has been an increasing component in Kenyan's diets and is associated with urbanization and higher incomes (Monroy at al., 2013). The country's current wheat consumption is estimated at 900,000–1,000,000 tons per year, which outstrips annual wheat production (300,000–400,000 tons) necessitating imports of about two thirds to meet consumption requirements (Bergevoet and Van Engelen, 2014). For example, in 2016, wheat production reduced by 6.8% to 222.4 thousand tons, while imports decreased by 4.2% to 1,362.3 thousand tons (KNBS, 2017). Additionally, Macauley (2015) observes that African countries are the world's largest wheat importers and that wheat consumption has risen steadily in Africa in the last 20 years due to population increase, changing food preferences and socioeconomic changes associated with urbanization. In the face of growing population, urbanization and rising prices of wheat and maize processed products, this situation is likely to compromise food security situation, especially for the urban poor.

There appears to be similarities between wheat and maize in terms of government involvement especially in policy as discussed in the previous sections. For instance, prior to December 1993, pricing and marketing of the main staple crops, namely; maize, wheat and rice, were controlled by the Government through NCPB at all levels of the value chain on the strength of constitutional powers bestowed to the Board under NCPB Act Cap 338 of the laws of Kenya. This included the setting of annual producer farm gate prices, into and ex-mill prices as well as wholesale and retail prices for maize, wheat and rice (Chemonics, 2010). Currently, in line with broader national policy shifts over time, marketing of wheat is liberalized in Kenya, whereby the private sector can import and domestic

marketing is not prohibited. The NCPB purchases wheat for the strategic reserve and monitors its trade (MAFAP, 2013).

Wheat is a major import in Kenya as she imports about five times as much wheat as is produced, with no exports in the last four decades (Monroy et al., 2013). During 2006 to 2011 the bulk of wheat imports were from Russia, Ukraine, Argentina and the United States accounting for over 75%. Nyoro et al., (2007) earlier reported that Argentina supplied about 90% of Kenya's wheat import requirements. The authors noted that while wheat imports had been rising, domestic production had been declining, largely due to high cost of production.

Traditionally, Kenya has protected domestic wheat producers with a 25% to 35% tariff. Under COMESA, Kenya's tariffs were harmonized with those of member states (35% for wheat and 60% for wheat flour) although COMESA and EAC agreed to a process to vary these rates as circumstances require (MAFAP, 2013; Monroy et al., 2013). In 2010, Kenya's tariff was reduced to 10%, through a duty remission scheme whereby importers paid the 35% tariff and then applied for remission, a measure that was unpopular among large-scale producers. In 2011 under "tariff-abatement" policy 18 Kenyan registered millers were allowed to import wheat duty-free for one year beginning mid-2011 (MAFAP, 2013: Monroy et al., 2013; GAIN, 2011). Monroy et al., (2013) note that for over 50 years Kenya has provided protection to wheat farmers. Indeed MAFAP (2013) found that import tariffs were effective in keeping prices for wheat, high for producers as opposed to maize. Maize and sorghum are typically imported duty-free from countries within the EAC and COMESA regions and are only imported from world markets under exceptional circumstances. Consequently, tariffs are not always effective in keeping maize and sorghum prices high for producers.

Government involvement in the wheat value chain also entails providing support to farmers in the form of research and extension and regulating and promoting trade. In addition, the NCPB is responsible for maintaining a food reserve and monitoring prices and markets (Monroy et al., 2013). As mentioned earlier, wheat in Kenya is grown by medium to large-scale farmers, who sell to NCPB or directly to millers. Kenya has 162 grain millers ranging from small hammer mills to large millers. Nineteen (19) large mills have a capacity of 1.5MT/year but utilization is about 50% (Chemonics, 2010). Pollard and bran are by-products of wheat milling that are critical ingredients in the animal feed industry. There are over 40 animal feeds mills with a capacity of over 800,000MT, organized under the Association of Kenya Feed Manufacturers (AKEFEMA) (Chemonics, 2010).

Millers sell the flour to wholesalers/retailers or bakeries which produce bread, pasta, biscuits and other confectionery products. There are about 148 registered bakeries with 90 employing over 50 employees each. They are organized under the Bakers Association of Kenya (BAKE). The industry is valued at Ksh 40 billion and employs about 20,000 people directly (Chemonics, 2010). In the bakery products distribution, it is estimated that about 200,000 distributors and retailers are involved. Kenya also exports small quantities of wheat flour products to surrounding countries (Chemonics, 2010). Appendix A3 adapted from Monroy et al. (2013) provides an exposition of the value chains in Kenyan wheat industry.

An important element of the wheat value chain in Kenya is the port and grain handling facilities. Before 2000, Kenya had no elevators and other specialized grain handling infrastructure, making grain handling and packaging labour intensive and expensive. The entry of a private company in 2000 (Grain Bulk Handlers), which began operating modern bulk grain handling facilities and held monopoly for over eight years, significantly lowered bulk handling costs (Monroy et al., 2013).

The farmers and millers organizations also play an important role in the wheat value chain, in what Chemonics (2010) refer to a horizontal linkages. For example, wheat farmers are organized under the Cereals Growers Association mostly focusing on large farm areas of western Kenya and Narok Wheat Farmers Association. They are also members of KFA (who supply inputs) as well as Kenya National Farmers Producers Association (Monroy et al., 2013). Wheat millers are organized under the Cereal Millers Association, animal feed manufacturers under the Kenya Feed Millers Association (AKEFEMA) and bakers under the Bakers Association of Kenya (BAKE) (Chemonics, 2010: Monroy et al., (2013). KARI, a parastatal, undertakes research on wheat and multiplication of seeds by the KARI Seed Unit. The associations in horizontal linkages lobby on behalf of farmers on issues of policy and taxation (Chemonics, 2010).

However, Chemonics (2010) observes that majority of farmers in the wheat industry are not vertically linked to millers. They sell their wheat to the NCPB, which sells to millers, although some large-scale farmers sell directly to millers. Millers sell their products through appointed wholesalers who in turn distribute to retailers. Some millers like Unga Millers have vertically integrated into animal feed production and sell their own brands to consumers (Chemonics, 2010).

We observe that there are similarities between maize and wheat in terms of government involvement in sourcing and processing as well as policy. However, the government has protected wheat producers through import tariffs, a measure not extended to maize producers. There are also several stakeholder organizations as well as government parastatals that are involved in wheat sourcing and processing.

3.3.3 Dairy

The dairy sector is crucial for rural development, poverty alleviation in rural and urban areas, food and nutritional security and increased household incomes (Bingi and Tondel, 2015; FoodWorld Media, 2017). It accounts for 14% of agricultural GDP and 6-8% of the country's GDP and generates an estimated 1 million jobs at farm level with an additional 500,000 in direct waged employment and 750,000 jobs in support services (FoodWorld Media, 2017; Atieno and Kanyinga, 2008). Kenya is one of the largest producers and consumers of dairy products in Africa, with a per capita consumption of 100 litres (Atieno and Kanyinga, 2008; Sourcewatch, 2012). Dairy production is a major segment of the livestock sector and a significant source of livelihood for about 625,000 smallholder farmers and 800,000 households. Kenya's dairy industry is largely based on smallholder production, which accounts for about 70 per cent of the total annual milk production in the country (Atieno and Kanyinga, 2008). In Kenya, dairy is mainly practiced in the medium to high potential areas which form 20% of the Kenyan landmass where exotic dairy cows and their crosses are predominant. In addition, 80% of Kenya is arid and semi-arid lands (ASALs) where livestock production is the main economic activity and milk is an important food in terms of nutritional value and as a source of income (Republic of Kenya, 2013).

Kenya's dairy production sector is characterized by a large number of small-scale farmers, who make up 70-80% of the total production. The Rift Valley and Central regions produce the bulk of the milk in the country, although Eastern, Nyanza and Western regions also produce significant quantities of milk. (FoodWorld Media, 2017). The combined efforts of government and development partners over the last 30 years have resulted in the improved or cross-bred dairy herd (Sourcewatch, 2012). The highland livestock production system is mainly based on British beef and dairy breeds. The grade herd is mainly composed of purebred Friesian/Holstein, Ayrshire, Guernsey, Jersey and their crosses,

constituting over 50% of the total herd. The Zebu herd constitutes over 70% of the total cattle population but contributes less than 20% of total milk production from cattle (Bergevoet and Van Engelen, 2014; Sourcewatch, 2012). Kenya has a herd of 3.5 million improved dairy animals, 14.1million indigenous cattle, 27.7 million goats, and 2.9 million camels according to 2009 census. Cattle account for 88% of the milk produced while the rest comes from camels and goats (Republic of Kenya, 2013; FoodWorld Media, 2017).

Kenya produces enough milk for local consumption[10] and exports some products to a number of countries. The zero grazing dairy schemes which were started in the 1970s have become a showcase of how smallholders can be incorporated in formal value chains. Still, less than 30% of all milk in Kenya enters the formal value chains (Bergevoet and Van Engelen, 2014). Of the total milk produced, about 60% is marketed through traders, cooperatives, hotels and kiosks. Informal traders dealing mainly in unprocessed whole milk, handle about 80% of marketed milk in Kenya (Republic of Kenya, 2013; FoodWorld Media, 2017). Republic of Kenya (2009) reported that in 2008, milk production was estimated at 5.1 billion litres valued at Ksh 100 billion indicating self-sufficiency at prevailing levels of effective demand. Kenyans consumed about 4 billion litres of milk in 2012, with consumption demand estimated to rise by 3 to 4% due to population, urbanization and income rise and anticipated to rise to 4.7 billion litres by 2018. In 2013, production stood at about 5.2 billion litres and is projected to reach 12 billion litres in vision 2030, where it is projected to grow by 4.5 to 5 % annually for the next ten years (Republic of Kenya, 2013).

Milk processing is dominated by many low capacity processors that lack capital and management competence. As of 2013 there were about 54 registered dairy processors with 34 operational. The low demand for pasteurized milk due to its relatively high price compared to the price of raw milk results in underutilization of the installed capacity (Republic of Kenya, 2013). Fresh liquid white milk is the predominant milk product accounting for about 60-70% of the total production. High value processed products including long-life milk, flavored milk, yoghurt, cultured milk, butter, ghee and cream are produced by a majority of the medium to large scale dairies, while most of the smaller specialist dairies produce yoghurt, cheese and ice cream, exclusively or with a few other products (Republic of Kenya, 2013; FoodWorld Media, 2017). Nationally, milk processing rose from 173 million litres in 2002 to 332 million litres in 2005. Kenya Cooperative Creameries daily milk intake increased ten-fold, from 40,000 litres per day in 2002 to 400,000 litres per day in 2006 (Atieno and Kanyinga, 2008). In 2016, the quantity of marketed and processed milk increased by 5.6% and 3.2% to 650.3 million litres and 451.7 million litres respectively while production of butter and ghee, and cheese decreased by 12.6% and 24.9%, respectively. The value of milk sales through cooperatives increased from Ksh. 5,497 million in 2015 to Ksh. 5,554 million in 2016 (KNBS, 2017). Kenya exports substantial quantities milk products (long life milk, milk powder and ghee) to the region and internationally into Asia and North Africa. Dairy imports (butter, cheese, milk powder, ice cream and cream) specifically from New Zealand and the European Union have gone down over time as Kenya becomes increasingly more self-sufficient in milk and milk products (FoodWorld Media, 2017).

Prior to and in the early decades of independence, the government was heavily involved in sourcing and processing of milk. Cooperatives also played a key role in the marketing of dairy products in Kenya over the years (Republic of Kenya, 2009). KCC was established in 1925 to facilitate the production, processing and marketing of milk. KCC exercised a national monopoly in milk marketing and the industry grew steadily in a protected market. In 1958, the Dairy Industries Act established KCC

[10] During drought, Kenya experiences a shortage of milk and has got to import from other countries while at the same time converting the reserved powdered milk for distribution.

as the sole agent in the marketing of dairy products throughout the country. Under the same Act, the Kenya Dairy Board (KDB) was created to act as the state regulatory agency for the industry. The KDB was empowered to levy a cess on commercially handled milk. KCC collected these fees on behalf of the KDB (Atieno and Kanyinga, 2008). After Independence in December 1963, state control of the dairy subsector was regarded as central to the country's development. The government adopted a broad policy goal for the country to be self-sufficient in dairy products and to export some dairy products to the regional market (Atieno and Kanyinga, 2008).

In a bid to promote smallholder dairy farming during the mid-1960s to 1970s, through government restructuring, KCC became a guaranteed market for all raw milk thereby widening access to KCC services for all farmers. KCC embarked on creation of a national network of chilling stations and processing and packaging plants, making it a reliable outlet for all dairy farmers, which cushioned smallholder farmers from price fluctuations. The government also supported the introduction of highly productive cattle breeds, and subsidized artificial insemination and veterinary services. By the mid-1970s, smallholder farmers were the major producers overtaking the large-scale farmers (Atieno and Kanyinga, 2008). Like several other agricultural support institutions, KCC experienced financial and managerial difficulties, occasioning irregular and delayed payments to farmers and consequently failure to cope with demand. Liberalization stimulated competition in the milk market along with increased milk prices for farmers. However it led to near-collapse of KCC in the backdrop of new private processors inability to cover the shortfall in KCC's processing capacity. By late 1980s some farmers stopped supplying milk to KCC, switching their allegiance to new private companies and cooperatives, and KCC's financial difficulties mounted (Atieno and Kanyinga, 2008). As a result, milk prices fluctuated widely and milk production declined in the 1990s.

In 1992, milk marketing was liberalized following recommendations in the Dairy Master Plan (1991), ending KCCs monopoly of milk marketing in urban areas and prompting KDB to license new processors and more dairy industry players. Liberalization opened up the market to sale of raw milk, in urban and peri-urban areas (Republic of Kenya, 2013). The most critical step in the liberalization of Kenya's dairy industry was the deregulation of both producer and consumer prices of milk in May 1992. This allowed private participation in dairy processing and marketing subject to meeting minimum standard hygiene requirements. As a result, many private processors have claimed a substantial share of the market, significantly reducing the dominance of KCC (now New KCC) (MAFAO, 2013). Liberalization saw the rapid growth of the informal milk trade mainly dealing with the marketing of raw milk and controlling an estimated 80% of all milk sold a situation that posed challenges of quality control and standards (Republic of Kenya, 2013).

In 1993, the Kenya Dairy Development Policy was formulated to guide the dairy industry through the liberalized market environment (Republic of Kenya, 2013; Atieno and Kanyinga, 2008). The main regulatory body in the dairy industry is the Kenya Dairy Board (KDB), whose role focuses more on dairy regulation and development activities, following deregulation of milk prices. The KDB has been instrumental in promotion, co-ordination, lobbying, trade negotiations, formulation of dairy policy, regulatory and inspectorate services for the dairy sector, research and development of private enterprise (Republic of Kenya, 2013). Republic of Kenya (2013) observes that there is need for a clear separation of regulatory and developmental roles of KDB for the benefit of the industry. Prior to 2003, the diary sector was characterized by inefficiencies and mismanagement, political interference and blatant plunder of KCC by the political class, leading to KCC going under liquidation. Since 2003, the government has focused on revival of the milk industry with some positive results. These include the

formal dairy sector almost tripling the amount of milk it handles, from about 144 million litres in 2002 to 423 million litres in 2007 (MAFAP, 2013).

The co-operative movement has played an important role in dairy production and marketing in Kenya. Cooperatives are instrumental in collection, bulking, and sale of farmers' milk to either processors or local consumers. The revival of dairy cooperatives in the post-liberalization era stimulated businesses such as feeds suppliers and providers of artificial insemination, veterinary, breeding and financial services. Small-scale market traders were allowed to operate licensed milk bars and transport operations, previously considered illegal, and received support from a project to improve hygiene standards (Atieno and Kanyinga, 2008). However, most operational cooperatives have weak management structures, inadequate capital base and low economies of scale, compromising returns to farmers and affordability for consumers (Republic of Kenya, 2013).

There appears to be weak government institutional mechanisms to support the dairy industry especially in areas of production costs through subsidies in inputs such as AI, feeds, research and extension support services, marketing and processing of dairy products as well as properly coordinated legal and regulatory framework. Although the sector has great potential to improve smallholder farmer livelihoods (as witnessed in the 1970s), there is low level of coordinated support for smallholder farmers especially in the context of liberalized regimes where the private players benefit more. In light of these deficiencies, during the period 2013-2017, the government committed to institutional reforms aimed at capacity strengthening (Republic of Kenya, 2015a).

These reforms involve restructuring of Kenya Plant Health Inspectorate Services (KePHIS), Pest Control Products Board (PCPB), Agricultural Development Corporation (ADC), Dairy Training institute (DTI), Kenya Meat Commission (KMC), and Kenya Dairy Board (KDB) (Republic of Kenya, 2015a). The government also commits to grant tax rebates on new investments to private and dairy cooperatives operators to support and promote local milk processing. This involves the removal of value added tax on inputs and zero rating of inputs used in liquid milk processing. The government aims to encourage dairy processors to actively involve producers in the collection of milk from the rural areas (Republic of Kenya, 2013).

Other than the government, the private sector is actively involved in sourcing and processing of milk. The dairy processing industry in Kenya is dominated by a few big processors (Brookside, New KCC, Sameer Agriculture and Livestock and Githunguri Dairy Co-operative Society) and a high number of smaller and medium operators. About 40 dairies actively produce and avail their products through the normal retail channels in a significant manner (FoodWorld Media, 2017). Brookside Dairy Ltd in Kenya (largest regional dairy firm), is the lead firm in dairy processing. Brookside has a strong downstream distribution network, product range, and innovative capability, positioning it to reshape cross-border collaboration and trade linkages in the dairy sector among the EAC countries. Brookside's regional milk supply base in Kenya and Uganda also provide the company with very strong capabilities to lead regional product development and branding while also exploiting market opportunities within and beyond the EAC countries in Africa (Daly et al., 2016). These firms are required to adhere to EAC Protocol on SPS measures and national certifications for dairy products (Daly et al., 2016).

In the recent past the dairy sector has been characterized by consolidation with several buy-outs by the leading processor, Brookside Dairy. Consolidation has arisen from the increasing need for pro-

cessors to own the process of milk sourcing from the farm to the factory and the challenge of procuring, distributing and accessing retail space in the major outlets (FoodWorld Media, 2017). In addition, there is a focus on regional growth by Brookside and Sameer Agriculture.

For decades, government policy on dairy development focused on promoting milk production with limited emphasis on processing, marketing and consumption (Republic of Kenya, 2013). There are many organizations both private and public that are involved in the development of the dairy industry. The public institutions are basically involved in standard setting, regulation, promotion and policy. The private sector comprising of formal and informal groups, is mainly involved in production, processing, marketing and input supply. The existing institutional and regulatory framework in the sector amounts to a multiplicity of actors with multiple roles, requiring rationalization and coordination (Republic of Kenya, 2013).

3.3.4 Beef

Animal production is a major economic and social activity for the communities living in both high rainfall and ASALs (arid and semi-arid lands), accounting for nearly 90% and 95% of employment opportunities and family incomes respectively (Republic of Kenya, 2015a). Animal production contributes about 5.5% of GDP, about 22% of agricultural GDP and over 40% of farm gate value of agricultural commodities (KNBS, 2015). On average, the country produces 320,000 MT of beef worth Kshs. 62.1 billion, with a beef cattle population estimated at 9 million (Republic of Kenya, 2009). By 2016, the number of cattle slaughtered increased by 8.2 per cent to 2,460.2 thousand heads (KNBS, 2017).

Livestock production in Kenya mainly occurs within three systems: pastoral, responsible for 80–90% of red meat production; cattle ranches/agro-pastoral, responsible for about 2–3% of total production principally for the high-value market; and highlands production/mixed farm system catering for the remainder (Bergevoet and Van Engelen, 2014). Livestock production systems in Kenya have clear distribution channels implying that shocks in a production system could cause significant disruptions in specific markets (Alarcon et al., 2017).

Most of the livestock sold in Nairobi and Mombasa comes from pastoral communities, and predominantly from northern Kenya and beyond. The main markets that supply animals are Garissa, Marsabit, Wajir, Mwingi, Isiolo, and Kajiado. Many of the animals coming from northern Kenya originate from across the border in Somalia and Ethiopia, while some of those from the southern corridor come from Tanzania (Farmer and Bwika, 2012). Approximately 80-90% of the red meat consumed in Kenya comes from livestock that are raised by pastoralists, with the remainder coming from highland cattle. While Kenyan pastoralists account for the majority of Kenya's meat supply (approximately 60-65% of the total), a significant portion (20-25%) comes from livestock raised in neighbouring countries with significant livestock populations (Ethiopia, Somalia, Tanzania and Uganda), making Kenya a meat deficit country (Farmer and Bwika, 2012). It is estimated that approximately two thirds of meat consumed in Kenya is beef, with large processing companies representing 11–13% of beef meat supply in Nairobi, the capital city (Alarcon et al., 2017).

In the past, processing and logistics in the beef industry was often organized through a parastatal-Kenya Meat Commission (KMC), which performed poorly until after 2002. The improved performance resulted from revitalization strategies of president Kibaki's regime such as Economic Recovery Strategy (Republic of Kenya, 2003), Strategy for the Revitalization of Agriculture (Republic of Kenya, 2004) and Agricultural Sector Development Strategy (Republic of Kenya, 2009). This role has largely been

taken over by commercial companies which command a substantial portion of the value chain (Bergevoet and Van Engelen, 2014) following liberalization and changing policy environment.

The government of Kenya has laid out strategies to improve livestock production and trade in two key policy documents namely: Economic Recovery Strategy for Wealth and Employment Creation (ERS) 2003-2007 and the Agricultural Sector Development Strategy 2010-2020. The ERS focuses on developing Kenya's ASAL areas to improve the welfare of communities that rely on livestock production as a main source of income. Under ERS, the government gives priority to strengthening livestock marketing and infrastructure and encourages private-sector entrepreneurs to establish slaughterhouses and other channels for the export market (MAFAP, 2013). In 2006, the Government invested in revival of the KMC and procurement of livestock from local producers which has led to increased market outlets for many livestock producers. Other investments include: the construction of satellite abattoirs in Isiolo and Garissa; rehabilitation of a slaughterhouse in Wajir; and seeking to expand livestock export markets by increasing beef cattle exports to the Middle East and Mauritius (MAFAP, 2013). To this end, the government plans to build four export slaughterhouses (Wajir, Garissa, Isiolo and West Pokot) and 18 local slaughterhouses for cattle and small ruminants. For the further development of slaughtering infrastructure, the government plans to adopt the following strategy: transform community slaughterhouses into private slaughterhouses; rent publicly owned slaughterhouses to private companies; own and exploit slaughterhouses cooperatively; and County governments to build and run slaughterhouses (Bergevoet and Van Engelen, 2014). Although the government has already built some of the local slaughterhouses, they are still not operational with the devolvement into Counties complicating the issue further (Bergevoet and Van Engelen, 2014). Market access and trade both for processed and unprocessed agricultural sector produce is central for sector growth. The government strategy in promoting market access and trade includes among others the establishment of export zones focusing on promoting export of livestock and livestock products (Republic of Kenya, 2015a).

The involvement of government in beef sourcing and processing has mainly been through the Kenya Meat Commission. The KMC is a public institution and by far the oldest and the most experienced meat processor in Kenya and the larger East African region. KMC is a fully integrated meat processor whose strength lies in the unrivalled efficiency of its meat processing plants along with its ability to process high volumes of quality meat in line with consumer tastes and preferences (KMC, 2017). KMC is also the biggest and most modern licensed export abattoir in East, Central and the Horn of Africa. KMC supplies top quality meat products to international markets such as: Middle East (U.A.E, Kuwait, Qatar, Saudi Arabia); East Africa (Tanzania, Uganda); Central Africa (Democratic Republic of Congo); and North Africa (Sudan, Egypt) (KMC, 2017). KMC procures all its raw materials for its processes with due consideration to high quality standards at all times. Strict procedures in livestock procurement and sourcing are adhered to. Stringent veterinary inspections of animals in the field, at reception, during the slaughter process and also at dispatch of the products are adhered to. KMC is Food safety management based ISO certified. In addition its product conforms to Kenya Bureau of Standards (KEBS) requirements (KMC, 2017).

Because Kenya is not self-sufficient in meat and her prices are higher than in neighbouring countries, there is a net flow of live animals into Kenya from Somalia, Ethiopia, Tanzania, and to a lesser extent Southern Sudan (Bergevoet and Van Engelen, 2014). On the other hand, Kenya is generally considered an exporter of live cattle, with Uganda and Mauritius serving as its main export partners. The export of beef and beef products increased after the Kenya Meat Commission (KMC) restarted its operations in 2006 after 15 years of closure (Bergevoet and Van Engelen, 2014).

There is also substantial involvement of the private sector in sourcing and processing of beef. It is only in recent years that the private sector has entered the slaughterhouse sector, which used to be a government and parastatal activity. Indeed the Business Daily (2017) and Bergevoet and Van Engelen, (2014) note that currently the products of private sector companies like Quality Meat Packers (main exporter of beef, goat and mutton) and Farmers Choice are far more prominent compared to public corporation like KMC's.

A large variety of slaughterhouse facilities exist in Kenya. They range from marginally equipped overpopulated (e.g. in Dagoretti), the basically equipped not overcrowded (e.g. Soision slaughterhouse), to the export certified (e.g. Farmer' Choice company) (Bergevoet and Van Engelen, 2014). Alarcon et al., (2017) identified three important segments in beef sourcing and processing system in Nairobi namely; the LTMs (local terminal markets), MMs (meat markets) and LPCs (large processing companies). Alarcon et al. (2017) found that 44–55% of the Nairobi city's beef supply flows through the 'local terminal markets', although 54–64% of total supply is controlled by one 'meat market'. Numerous informal chains exist with independent livestock and meat traders playing a pivotal role in the functionality of these systems. There is inefficient quality control, inadequate infrastructure and organization in conduct of activities thereby generating wastage and potential food safety risks in low quality meat products (Alarcon et al., 2017).

Most large processing companies (LPCs) are involved in integrated slaughtering of livestock, marketing and distribution of products. They also have private standards (company rules), enforced by company managers and carry out extensive value addition of products that are also branded (Alarcon et al., 2017), mainly dominating the high income segments. LPCs operate with high quality infrastructures although up to 60% of their beef supply depends on similar routes as the informal markets. These companies engage in value addition activities, are able to reach high-end markets while dominating the distribution of popular products, such as beef sausages, to middle and low-end market (Alarcon et al., 2017). Large companies export up to 90% of their products. Lack of traceability and control of animal production was found to be a common feature in the beef value chain. For instance, Alarcon et al (2017) demonstrated that local terminal markets (LTMs) and large procession companies (LPCs) rely on independent livestock traders for 80% and 60% of their livestock supply, respectively, and that these depend on primary markets. This situation leads to a lack of traceability of animals, with inspectors, LPCs and meat traders not having any information or control on their initial source and their production management, and therefore being vulnerable to disease outbreaks.

The heterogeneity, independence and multiplicity of local terminal markets and meat traders-termed as "disorganized", diminishes their capacity for value addition and represents an important barrier to entry into high end market and export opportunities (Alarcon et al., 2017). There is a large diversity of flows in terms of actors and product profiles in these market values chains as shown in Appendix A4. Lack of value addition in this highly informal chain may arise from low economies of scale, lack of demand for value added products, lack of marketing strategies and technological/management constraints (Aklilu, 2002; Kenya Market Trust, 2014; Alarcon et al., 2017). This is in contrast to the large processing companies, who control a small segment of beef market in Nairobi (Alarcon et al., 2017). This ownership structure explains why the sector is in such dire straits, considering the on-and-off operational status of KMC. KMC went under receivership in 2013 after 2006 revival, but is currently operational (Bergevoet and Van Engelen, 2014; KMC, 2017).

Bergevoet and Van Engelen (2014) observe that the Kenyan livestock sector needs to develop a holistic approach towards the meat sector, in terms of competitiveness, customer demand, food

safety, environment, animal welfare (Bergevoet and Van Engelen, 2014). Slaughter facilities and processing for cattle and small ruminants have improved over the last 10 years. Howevera lot remains to be done in the slaughtering, deboning, transport and retail fields in order to meet minimum standards of hygiene and public health as well as international SPS standards (Bergevoet and Van Engelen, 2014). For example, the design of the slaughterhouses is not adequate and requires extensive remodeling and overhaul or even new construction to meet current international standards, more so the development and maintenance of a cold chain.

3.3.5 Vegetables

The horticultural sector contributes 36% of agricultural GDP and is a leading foreign exchange earner, despite having not had a policy to guide its growth and sustainability to date (Republic of Kenya, 2012). Horticulture contributes enormously to food security and household incomes to a majority of Kenyan producers mostly smallholder farmers, employing over six million Kenyans directly and indirectly (Republic of Kenya, 2012; Research Solutions Africa (RSA), 2015). Vegetables account for 44.6% of the total value of horticultural produce. About 95% of horticultural production goes to the domestic market while 5% goes export market (RSA, 2015; Republic of Kenya, 2012). Kenya is a major exporter of horticultural produce to the European market (Republic of Kenya, 2012). Vegetables account for a significant part of exports with over 50% going to the UK (Republic of Kenya, 2012). Main vegetables produced in Kenya include; Irish potatoes, tomatoes, cabbages, snow peas, kales, spinach, runner beans, French beans, carrots, broccoli, baby corn, okra, avocados, onions, indigenous vegetables, and Asian vegetables. Tomatoes, cabbages and French beans lead in terms of enterprise value per acre (Republic of Kenya, 2012).

Between 2010/2011 vegetables realized negative growth in export volumes (-26%) with no change in value (Republic of Kenya, 2012). However, according to KNBS (2017), the volume and value of fresh horticultural exports has continued to increase for the last 3 years. In 2016, the volume of horticultural exports increased by 9.4%, from 238.7 to 261.2 thousand tons during 2015 and 2016 respectively. Exports of fresh vegetables went up by 13.1% from 69.7 thousand tons over the same period. In 2016, value of fresh horticultural exports increased by 12.3% to Ksh. 101.5 billion due to improved prices for horticultural produce in the international market, while earnings from exports of fresh fruits and vegetables increased by 10.6% and 12.0%, respectively.

The Kenyan horticultural sector has largely been private sector driven, a trait attributable to its success so far. In Kenya, vegetables are produced mainly by smallholder farmers, due to pressure from human settlement and urbanization although there is potential in underutilized ASALs for large scale production (Republic of Kenya, 2012). However, Republic of Kenya (2012) reports that the government has continued to implement programs and projects geared towards increasing area under horticultural production in the ASALs and intensifying production in medium- and high-potential areas, with emphasis towards greenhouse farming. Several institutions both public and private are involved in the horticultural industry. They include: Ministry of Agriculture (MoA); Horticultural Crops Development Authority (HCDA); Kenya Agricultural Research Institute (KARI); Kenya Plant Health Inspectorate Service (KEPHIS); Kenya Flower Council (KFC); Fresh Produce Exporters Association of Kenya (FPEAK); Kenya National Federation of Agricultural Producers (KENFAP); Smallholder Horticulture Marketing Programme (SHoMaP) of Ministry of Agriculture; and Kenya Horticultural Competitiveness Programme (KHCP) of USAID among others (Republic of Kenya, 2012). The major actors in horticulture trade are producers, traders, middlemen, transporters and local authorities. The margins between farm gate prices and consumer prices are usually wide and indicative of suppressed profitability for the producer (Republic of Kenya, 2012).

As noted earlier the sector has not had a policy guide prior to the National Horticulture Policy-2012. The National Horticulture Policy outlines key policy interventions to revamp and reposition the sub-sector (Republic of Kenya, 2012). Nevertheless, like the rest of the agricultural sector, the horticulture sub-sector has operated within the prevailing national policy regime shifts described in section 2.1. Initially, the Horticultural Crops Directorate (HCD) focus was on development and marketing, product value-addition, opening up new production areas and markets, undertaking market promotions and marketing produce on behalf of the farmers (Republic of Kenya, 2016). Other key mandates of HCD related to sourcing and processing of vegetables were as follows. To provide advice on horticulture production and marketing. To regulate horticulture nurseries, production, post-harvest handling and marketing of horticultural crops and produce. To promote development and adoption of standards for labelling, packaging, grading, transporting and storage in compliance with local and international standards. To impose levies, fees or charges on producers, dealers and nursery operators. To promote establishment and use of production, processing and marketing infrastructure and facilitate marketing of horticultural products in the local and international markets (Republic of Kenya, 2016). With liberalization and reduced government involvement in direct trading, HCD's role involves regulating, promoting, coordinating, developing and facilitating operations of the horticultural sub-sector to ensure smooth production and marketing environment and to advocate for policies that favour investment and enhanced performance of the sub-sector (Republic of Kenya, 2016).

The vegetable trade and value chain in Kenya faces a number of hurdles resulting in limited processing of the produce. Republic of Kenya (2012) note that agro-processing and packaging technologies are relatively underdeveloped in Kenya, which compromises produce shelf life, consumer acceptance and increases post-harvest losses. Seasonality of production renders many processing firms to operate below capacity, which coupled with high costs of production make Kenya's processed products less competitive (Republic of Kenya, 2012). As such, Kenya exports largely semi-processed and low value-produce, due to limited ability to add value attributed to low capacity and high cost of value addition infrastructure. Furthermore, the literature shows that as of 2012, most municipal markets were poorly constructed and managed rendering them inappropriate for fresh produce handling as most lacked fresh produce handling and storage facilities (Republic of Kenya, 2012). This led to mix up of commodities and deterioration of quality. This situation forces the farmers to sell their produce immediately after harvest at low prices thereby compromising their incomes.

Through policy intervention the government has sought to ameliorate the hurdles along the value chain. Infrastructure is at the heart of successful vegetable trade and value chain. The perishable nature of horticultural produce coupled with poor and dilapidated roads leads to damage, lowering of quality and delayed delivery. The government has committed to improving roads, rehabilitating old and establishing new irrigation facilities, improving sea ports and the railway system, developing produce cold-chain facilities and constructing modern markets (Republic of Kenya, 2012). This is in addition to upgrading of airports, improving electronic communication, and improving on existing, new and renewable energy sources. The government also intends to provide physical market facilities in all municipalities with very elaborate management systems as well as creation of horticulture mega-markets in major cities and towns to handle both wholesale and retail marketing of fresh produce in hygienic conditions (Republic of Kenya, 2012). To this end and though still inadequate, the government constructed 8 cold storage facilities in some selected major production areas. In addition, the private sector has installed cold storage facilities at the airport and others have been put at the farm level particularly by the flower producers (Republic of Kenya, 2012).

Other challenges hindering value addition for the horticultural produce include: inadequate incentives for investment in value addition and marketing strategies to promote consumption of locally processed products; high cost of local processing and compliance with processing requirements; unfavourable technologies for small scale value addition; and inexistent comprehensive inventory of players involved in value addition (Republic of Kenya, 2012). In addition, Republic of Kenya (2012) acknowledges that due to multiple taxes, low incentives, rampant produce poaching and high cost of doing business in Kenya, a few multinationals in the horticultural sector have shifted to other countries. This unfavourable trend is a threat to the industry that the government policy (Republic of Kenya, 2012) aims to mitigate. The shift from tariff to non-tariff barriers in international horticultural trade has necessitated more regulation of the industry to comply with the new market requirements (Republic of Kenya, 2012). The policy (Republic of Kenya, 2012) proposed that taxation be carried out only at the point of sale for domestic market and point of exit for the export market, to mitigate multiple levies, and taxes on horticultural produce. Lack of harmonization of activities of government agencies involved in regulating the industry lead to delays and increased cost of complying with non-tariff barriers, with attendant costs (RSA, 2015). The government recognizes its role in establishing mechanisms for strengthening interagency coordination on regulation (Republic of Kenya, 2012). Currently, the National Horticulture Task Force provides a platform for addressing challenges that are multi-sectoral in nature, though it lacks the legal status to implement or enforce policy (Republic of Kenya, 2012).

Although the sector has made significant achievements in complying with international market requirements such as the stringent sanitary and phytosanitary requirements, these standards are less observed for locally consumed produce (Republic of Kenya, 2012), presenting additional threats to the industry. This coupled with liberalization, regional integration, high cost of local production and low adoption of modern technologies by Kenyan farmers has led increased imports of horticultural produce from Uganda, Tanzania, Sudan, Ethiopia, Somalia, South Africa and Egypt (RSA, 2015; Republic of Kenya, 2012). This could adversely affect local production and depress prices with negative implications on local livelihoods.

3.4 Challenges and Opportunities

This section dwells on challenges and opportunities with respect to policy, sourcing and processing. The discussion will focus on what has been achieved, what is lacking and the opportunities the challenges present for improvement of the sector. Although the agriculture sector continues to be a fundamental pillar for sustainable development and poverty reduction in the country, it continues to face challenges and emerging constraints at the global, regional and national levels (Republic of Kenya, 2015a). Most of the challenges relate to: farmer support in terms of inputs, institutions, technological capacity; improvement of land use and productivity; infrastructure; commercialization and diversification of agriculture; value addition enhancement for agricultural exports and marketing; as well as trade matters related to multiple levies, tariffs and non-tariff barriers.

At the national level, Republic of Kenya (2015) identified several constraints facing the agricultural sector in general. Poor governance and corruption in agricultural processing, cooperatives and farmers' organizations result in inefficiencies in the performance of the sector. Inadequate quality control systems result in poor packaging, damage during transportation, poor handling and contamination with attendant restrictions on exports of agricultural products.

Another constraint has been multiplicity of taxes whereby producers are subjected to multiple taxes and levies (Republic of Kenya, 2015a). Farmers have been subjected to multiple taxes from local

authorities and government departments as they transport or market their produce. These multiple taxes contribute to reduction of net farm incomes and create distortions in marketing structures without necessarily improving the services that these authorities are supposed to deliver (Republic of Kenya, 2009).

Agricultural produce market access and marketing infrastructure are poorly organized and inadequate. There is lack of an effective marketing information system, structured markets for various commodities and infrastructure, which is a major drawback to market access domestically (Republic of Kenya, 2015a). For example, fresh vegetables trade in Kenya is largely informal and hampered by scanty and inconsistently recorded data on local trade (RSA, 2015). Similarly, in relation to beef sourcing and processing, "policies oriented at improving market facilities to control animal flows and to organize business transactions may improve system efficiency and reduce disease hazards in the systems. Improving standardization of livestock and meat grading in LTMs and MMs, would potentially contribute to improve efficiency of the system and allow for adequate flow of information of animals and products to stakeholders and to generate market opportunities" (Alarcon et al., 2017). Republic of Kenya (2009) notes that reviving marketing and associated infrastructure is critical in promoting agriculture as a commercial business. This requires revived, efficient and effective role of cooperative societies as well as establishing wholesale and retail markets across the country. This constraint presents a challenge particularly with the processing stage of the food systems.

Diversification into non-traditional agricultural commodities could increase and stabilize agricultural output, productivity and incomes and significantly check famine and improve food security. Kenyan agriculture would also benefit from exploiting potential in agro-processing, regional markets and encouraging private-sector-led development of the sector (Alila and Atieno, 2006a). In addition, the dependence on a few external market outlets makes agriculture exports very vulnerable to changes in the demand of agriculture products and unexpected non-trade barriers by foreign markets (Republic of Kenya, 2015a). For instance, the Kenyan horticultural exports rely heavily on traditional European markets, increasing their vulnerability due to lack of diversification. (Republic of Kenya, 2012). This calls for expansion of the narrow export product range and destination.

In Kenya, about 91% of total agricultural exports are in raw or semi-processed form. Value addition through processing, branding, quality certification and accreditation, as well as farm level quality improvements has potential to earn Kenya much needed foreign exchange, while improving the food security situation through enhanced incomes for farmers. Potential for value addition of dairy, beef and vegetables among others remain largely untapped (Republic of Kenya, 2009). Alarcon et al., (2017) observes that some of the opportunities that exist for the development of Kenya's meat sector include development of value chains. They note that Kenya has a small number of commercial ranches especially in Laikipia, raising Kenyan Boran cattle, which are known for their superb carcass and meat quality. These form a brand-able product for which premium prices in the local high-end market and export market can be achieved. Macauley (2015) calls for development of an effective wheat value chain system to create market outlets for farmers and stakeholders by identifying constraints faced by a diversity of actors and by setting key strategic interventions for promoting wheat production, processing and marketing along the value chain (Macauley, 2015). The growth of the dairy sector can be achieved through fully marketing the milk surplus. Processed long shelf life dairy products provide an opportunity for marketing surplus milk as well as increasing exports to the neighboring region and even beyond. This can be achieved through an efficient and competitive domestic dairy industry (Republic of Kenya, 2013).

Infrastructure in terms of roads, electricity, collection, storage and processing facilities are vital for a competitive agriculture and agribusiness sector. Poor infrastructure results in high transport costs which slows the distribution of food from regions with surpluses to those with deficits. Underdeveloped rural roads and other key physical infrastructure have led to high transport costs for agricultural products to the markets as well as farm inputs. Many feeder roads in milk producing areas are inadequately maintained and in poor condition rendering milk collection inefficient (Republic of Kenya, 2013). Furthermore, good infrastructure can improve the access of households to production inputs and markets, which can have a major impact on their economic activity (Republic of Kenya, 2009; Republic of Kenya, 2015a). High transport costs for agricultural inputs and products resulting from poor rural roads, lack of or expensive electricity in rural areas has reduced farmers' ability to compete (Republic of Kenya, 2013). This constrains their affordability for cold storage facilities; irrigation and processing of farm produce further reducing their competitiveness in national and international markets (Republic of Kenya, 2009). For example, Republic of Kenya (2012) reports that post-harvest losses in horticultural sector were estimated at 40% of total production in 2011. Republic of Kenya (2013) reports losses of approximately 3% of total milk produced during flush periods due to poor infrastructure, while Atieno and Kanyinga (2008) observe that poor feeder roads reduce the farm-gate price of milk. This calls for mechanisms for completion and appropriate location of incomplete facilities and utilization of idle facilities such as National Cereals and Produce Board (NCPB) stores (Republic of Kenya, 2015a). Less than 7% of Kenya's cropped land is irrigated, while as much as 83% of land is arid or semi-arid and classed as 'low potential'. Increasing the irrigated area could stabilize agricultural output and reduce dependence on rain-fed systems (Alila and Atieno, 2006a).

The bulk of milk in Kenya is produced in the rural areas. This requires an efficient collection, cooling and marketing systems in order to minimize losses along the value chain due to its perishability. Predictable and well-managed milk collection system motivates farmers to increase production, as was witnessed before the collapse of KCC, which had invested in the design, operation and maintenance of an organized and orderly milk collection system. Inadequate milk preservation facilities in Kenya undermine realization of a significant potential in dairy production. A major concern for farmers in milk marketing has been the development of marketing channels that minimize losses and maximize returns (Republic of Kenya, 2013). Although liberalization saw the entry of private players in the dairy sector, milk collection system has been erratic, with attendant losses (Republic of Kenya, 2013).

Inadequate storage and processing facilities constrain marketability of perishable goods such as dairy products, beef and vegetables as well as marketability of durable produce. Poor infrastructure in terms of milk handling and storage facilities at the farm level leads to milk spoilage and loss at the farm. Also, due to high and unaffordable prices of conventional milk packaging materials, there is a tendency to package milk in materials that are non-food grade, unhygienic and environmentally unfriendly. This has also led to a shift from packaged to unpackaged milk in response to demand by the low-income groups, prompting concerns with respect to health risks and quality standards (Republic of Kenya, 2013). In addition, milk collections equipment such as plastic jelly cans used to transport milk to the processors and to consumers by farmers impact on milk quality (Republic of Kenya, 2013). Despite recent investments by the major dairies and co-operatives for processing, infrastructural challenges remain, with limited capacities of dairies to convert excess milk into long life products and limited storage at the dairies (FoodWorld Media, 2017).

The bulk of marketed milk in Kenya is rarely cooled, as most of the 600 coolers in the country are non-operational and the cost of investing in cooling facilities by small scale farmers is unaffordable. This results in spoilage and disease risks to dairy herd's udders as farmers prolong the duration before

milking in addition to using illegal chemical agents to preserve milk. Farmers also lack incentives to safeguard quality since milk processors pay based on quantity and not quality, resulting in human health and restricted markets (Republic of Kenya, 2013). To confront the problem of cooling, the government's stated policy direction is to: speed up the rural electrification program, especially in milk producing areas; explore and recommend reduction of electricity tariffs to ease the cost of milk cooling; encourage investment in cold chain infrastructure by marketing cooperatives and private investors through the provision of incentives, such as tax exemptions on the necessary imported equipment; encourage processors to adopt quality sensitive pricing mechanism (Republic of Kenya, 2013).

Inputs are a real challenge. Despite the substantial contribution of small scale farmers to agricultural produce, their adoption of improved inputs such as hybrid seed, concentrate feeds, fertilizers and pesticides and machinery is relatively low, reducing their potential for higher productivity (Republic of Kenya, 2009). For instance, one of the challenges for the smallholder dairy schemes is to grow and/or procure sufficient fodder and feed. This usually results in poorly fed cows and consequently delayed re-conception and low production level. In addition, the growing stock is badly fed, prolonging the duration before these animals are ready for first service or sale for slaughter. If there were a market for young bull calves out of the dairy sector, farmers could sell these calves and save the fodder and feed for their dairy cows (Bergevoet and Van Engelen, 2014). Republic of Kenya (2013) notes that the average productivity per cow in Kenya is low compared to global averages. The low productivity is attributed to inadequate and inefficient breeding services, inefficient dairy research, poor animal husbandry, inadequate extension and advisory services, inadequate feeding, low quality feeds, environmental, socio-economic/cultural factors, ineffective disease control and veterinary services, poor infrastructure, high cost inputs/labor among others. Poor access to output markets also contributes to low incentive to increase production, and hence low demand for the above requisite inputs (Republic of Kenya, 2013).

Several challenges facing the dairy sector were identified. The sector lacks capacity to cope with seasonality of dairy production and fluctuations between periods of production surpluses and deficits, causing excess and idle capacity and wastage leading to loss of incomes for farmers (FoodWorld Media, 2017; Atieno and Kanyinga, 2008). Kenya has limited capacity to store excess milk and in peak seasons, neither KCC nor the other major processors can absorb all the milk produced in Kenya. Powdered milk can be stored easily, but KCC is currently the only company capable of converting milk into powder and it lacks the capacity to process all the milk delivered to it (Atieno and Kanyinga, 2008). This calls for investments in storage and processing capacity to stem losses of produce and incomes to farmers. Poor quality of milk is a major challenge for the dairy processors. This results from poor milking practices, a fragmented small-scale dairy farming system and lack of cooling and storage facilities at the farm. The poor quality milk reduces the acceptability and shelf life of the processed milk well as the ability of the dairies to export (FoodWorld Media, 2017). Proper feeding is paramount for dairy productivity because feeding alone accounts for about 70% of the production costs. The main constraint to adequate cattle feeding is the low quality and inadequate quantity of the available feeds. High prices and falling quality standards of feed supplements has continued to be a problem in the development of the dairy sector (Republic of Kenya, 2013). Unavailability of local sources of vitamins, amino acids, macro and micronutrients also hinders production of low priced feeds. The recent imposition of VAT on supplement feeds, and minerals has further compounded the challenges of quality feeding of dairy animals (Republic of Kenya, 2013). Despite the challenges in the dairy industry, Kenya has a robust and growing processing sector providing high potential for the actors in the value chain across different food systems. In spite of efforts to develop the dairy industry,

constraints in production, marketing and trade persist including low dairy farm productivity and inadequate milk quality stemming from technological, capacity, organizational and policy weaknesses. Regional-level interventions especially removal of barriers to trade products and inputs as well as creating a regional regulatory framework and developing capacities could address some of these constraints (Bingi and Tondel, 2015).

Adoption of modern farming practices presents a huge potential for increasing productivity for these farmers. However, high cost of crude oil, fertilizers, agro-chemicals, agricultural machinery and equipment, animal health and other production inputs translate into rising cost of production. In particular, high oil prices have a strong bearing on international freighting and distribution of agricultural produce (Republic of Kenya, 2015a). Creating a favourable and enabling policy environment to encourage private sectors and to facilitate farmer access to credit, production inputs and machinery is needed, especially in the wheat value chain. Consequently, domestic wheat production can become more competitive by improving marketing efficiency and lowering transaction costs, and by designing policies, institutions and infrastructure to reduce the costs of acquiring inputs and marketing wheat (Macauley, 2015).

A SWOT analysis of the beef sector in Bergevoet and Van Engelen (2014) identified the following weaknesses: weak policy and legal frameworks to support the cattle industry; low livestock productivity in many systems due to sub-optimal management and disease occurrence; weak support structures for essential services (veterinary, extension); unreliable data and information management in the industry; increasing transport costs; and dilapidated marketing and slaughtering infrastructure. Republic of Kenya (2012) and RSA (2015) identify several factors hindering the potential of the horticultural industry. They include; multiple taxation regimes, low incentives in terms of local market prices, high costs of inputs and air freight and a generally unregulated environment. Agro-processing, packaging and quality standards in the domestic market are also not fully developed. Better production methods, post-harvest care and quality to improve consumer acceptance of produce in order to earn higher value are necessary, together with ensuring that the produce complies with international markets standards (RSA, 2015; Republic of Kenya, 2012).

Although intra-regional trade has been strengthened through regional integration arrangements such as SADC, COMESA and EAC, constraints to regional integration remain, mostly lack of convergence of national economic and political interests (Republic of Kenya, 2015a). Global constraints comprise of unfavourable international terms of trade, rising costs of inputs, climate change and global economic recession. Developed countries continue to impose prohibitive tariff and non-tariff barriers on Kenya's exports. These include biased trade agreements, use of agricultural subsidies in support of farmers in developed economies and protectionist policies, which result in unfavourable market access and declining commodity prices (Republic of Kenya, 2015a). In addition, international trade negotiations such as those under World Trade Organization and the Economic Partnership Agreements (EPAs) have been slow and have achieved little progress in the last decade.

As a member of the World Trade Organization (WTO), Kenya is committed to the principles that underpin free trade. However, Kenya's participation in world dairy and food standards setting forum has been limited. In this regard the government endeavours to classify dairy output as a special product under the WTO to take account of its significant contribution to food security and poverty alleviation in addition to meeting world export standards and avoiding dumping of sub-standard milk and milk products in the domestic market (Republic of Kenya, 2013). Promoting dairy exports to regional markets has been a challenge, due to Kenya's high production costs. Accessing regional markets is also restricted by sanitary and phytosanitary standards (Atieno and Kanyinga, 2008). Further, Kenyan

dairy producers face competition from the importation of powdered milk and other dairy products – although this is reducing. Milk should be gazetted as a strategic food commodity, as this would exempt milk from value-added tax and make it more affordable (Atieno and Kanyinga, 2008).

Although there have been substantial achievements through the ERS, SRA and Kenya Vision 2030, food security, poverty reduction and transformation of agriculture from subsistence to farming as a business still remains a challenge in areas of agribusiness, markets, efficient use of inputs and agricultural credit (Republic of Kenya, 2009). Kenya Vision 2030 (Republic of Kenya, 2007) and Alila and Atieno (2006a) identified several challenges facing agricultural sector. These challenges include: low productivity arising from inability of farmers to afford modern farming technologies; poor institutions; marketing and storage facilities; high transport cost; improper handling and wastage of crops; under-exploitation of land use for agricultural production; over-reliance on rain fed agriculture which is a major contributor to food insecurity; market inefficiencies in the supply chain resulting from limited storage capacity; lack of post-harvest services and poor access to input markets; limited value addition; limited diversification of agricultural products and exports; low value-added in agricultural exports which increases vulnerability of incomes to international market trends; and low commercialization, diversification and investment in agriculture. Kenya's agricultural related exports are mostly semi-processed, low value which coupled with high production costs makes exports less competitive. Kenya has therefore been importing products which could be processed locally and consequently benefiting marginally in the value chain (Republic of Kenya, 2009).

Nation Media (2017) noted that the solution to the perennial food security challenges lies with farmers. According to FAO Kenya program coordinator, there is need to provide quality seeds, offer quality advisory and extension services, ensure there is enough farming land even as real sector grows, open up East African markets for easy distribution of commodities and make farming pay as a business through adoption of technology. However, through various policy and strategy implementation, the government has made some attempt to adopt agricultural technologies to improve productivity. They include empowering agricultural extension officers, encouraging farmers to embrace farming as a business, easing farmers' access to inputs, and funding creation of partnerships between farmers and agricultural stakeholders (Nation Media, 2017). Government policies to promote commercial, market-oriented and profitable agriculture to raise incomes and increase food security in Kenya are supported through high levels of public expenditure. MAFAP (2013) concludes that Kenya is moving towards policy coherence though constraints remain. Agricultural sector policies have gradually adapted to the country´s general policy and political changes towards market liberalization, privatization and commercialization of the agricultural sector. This is reflected in the downward coherence and continuity between national strategies, sector policies and policies related to other supportive sectors. Although there has been clear progress over the past 10 or so years towards coherence in the agricultural sector, it is still identified as a challenge in the current national development strategy of Kenya.

3.5 Summary and Conclusion

The agricultural sector plays a key role in the food system more specifically in production, processing and consumption. Consequently, the policy framework, governance and economics of food production and processing have important implications on food security and its sustainability. This chapter presents a discussion on Kenya's agricultural policy framework, government involvement in sourcing and processing of maize, wheat, dairy, beef and vegetables, as well as challenges and opportunities. The five commodities were assessed to represent three food systems namely; local (maize), national (wheat, beef and dairy) and international (vegetables).

The agricultural policy in the post-independence (1963-1980s) was implemented by direct government intervention with the main policy objective of achieving food self-sufficiency as echoed in the Sessional Paper No. 4 of 1981 on the National Food Policy (NFP). During this period, most of the agricultural production and marketing parastatals such as NCPB, KCC and KMC were under government control. The government was involved in providing subsidies of inputs such as fertilizers and artificial insemination (AI) as well as directly controlling the marketing of these commodities through setting of grain prices, state monopoly of inputs distribution and across the board fertilizer subsidy. The government also set farm-gate and consumer prices for all basic agricultural commodities including maize, maize meal, wheat grains, wheat flour, bread, milk and milk products. In addition, the government engaged in investments in productive infrastructure such as irrigation schemes. In spite of these efforts, the sector was characterized by inefficiencies, poor institutional management dismal performance. We observe that during this period there was substantial government involvement in production and marketing of most agricultural commodities.

During the liberalization period several agricultural commodities' production and marketing suffered following government's eventual withdrawal from pricing and provision of input subsidies and marketing services through various boards and parastatals. Needless to say this had adverse effects on employment, incomes and food security, especially for smallholder farmers. Price deregulations and market liberalization allowed for food imports, while protecting farmers through policy stance such as NFP, ERS, Vision 2030, SRA and ASDS. These policies afforded agriculture high prominence, priority and support, recognizing its role in economic growth in the post liberalization era. They also sought to raise household incomes, create employment and ensure food and nutrition security through creation of favourable institutional operation environment and revival of nearly collapsed agricultural institutions such as KMC, KCC, KSC, AFC and ADC. Within the SRA framework the government considered providing a limited number of goods and services, and a reduced range of regulatory functions that could not be enforced by private self-regulation. To this end agricultural price policies supporting the producers were characterized by a strong Government presence and control of produce and input prices such as price stabilization and producer support prices for maize through NCPB. These policies saw positive developments such as growth in agriculture (6.4% in 2006), reduction of food insecurity and poverty (12% and 10%), and increase in productivity of key commodities (over 6% per annum) during 2003-2007.

Available literature shows that government involvement in sourcing and processing of the assessed products varies, with substantial involvement in crops like maize and wheat to minimal involvement in horticultural crops like vegetables. Furthermore, the involvement is largely in form of providing the policy guidance and providing conducive legal and regulatory environment within which the sub-sectors operate as well as development of flagship projects and programs for the agricultural and livestock sector. These projects are evident of government involvement in supporting production, processing and marketing of agricultural produce.

Before liberalization in 1989, NCPB had monopoly powers to purchase, store, market and generally manage cereal grains (e.g. maize and wheat) and other produce in Kenya. It was empowered to regulate and control the collection, movement, storage, sale, purchase, transportation, marketing, processing, distribution, import, export, and supply of maize, wheat and other scheduled agricultural produce under a controlled price system. Following government's partial liberalization of the maize market in 1988, Kenya operated two parallel maize marketing systems until 1993 when maize marketing was fully liberalized. These were the unregulated private trade in maize within the country at prices determined by market forces and the official marketing system through the NCPB. NCPB had

the mandate of stabilizing prices, maintaining strategic reserves and purchasing maize for relief purposes with the government undertaking ad hoc export bans whenever poor harvests or deficits were anticipated. Kenya's national maize production has over time been outstripped by consumption driven mainly by population growth, necessitating imports considering that maize is a staple crop. Indeed, in the early 1990s Kenya transitioned from a net exporter to net importer in official maize trade. This spells dire implications on the food security situation of Kenyans especially due to high levels of poverty and the attendant high food prices during times of shortages as was recently experienced from April-July 2017 when there was literally no maize flour on the shelves. Besides, the government has a role of promoting domestic production and protecting farmers, while restricting imports through import tariffs and export bans to safeguard food self-sufficiency.

Government involvement especially in terms of policy, legal, regulatory environment and institutional support by way of flagship projects and programs appears to be similar between wheat and maize as stated earlier. Wheat is the second most important grain after maize in terms of both production and consumption and the second most important agricultural commodity in Kenya from a food security view point. Wheat consumption has outstripped production necessitating imports to meet consumption requirements, largely due to changing food preferences and socioeconomic changes associated with urbanization. In addition, wheat imports have been on the rise while domestic production has been declining largely due to high cost of production. With growing population, urbanization and rising prices of wheat and maize processed products, the food security situation especially for the urban poor is potentially compromised. Kenya has traditionally protected domestic wheat producers with a 25% to 35% tariff, although COMESA and EAC agreed to a process to vary these rates as circumstances require.

Prior to and in the early decades of independence, the government was heavily involved in sourcing processing and marketing of milk through KCC monopoly, which ended with liberalization in 1992 and the eventual formulation of the Kenya Dairy Development Policy to guide the dairy industry through the liberalized market environment. Despite the various national and agricultural sector specific policies in place post-liberalization, there appears to be weak government institutional mechanisms to support the dairy industry especially in areas of production costs through subsidies in inputs such as AI, feeds, research and extension support services, marketing and processing of dairy products as well as properly coordinated legal and regulatory framework. This low level of coordinated support for smallholder farmers especially in the context of liberalized regimes has seen private players benefit more. The dairy processing industry in Kenya is dominated by a few big processors such as Brookside Dairy and KCC and a high number of smaller and medium operators. For decades, government policy on dairy development focused on promoting milk production with limited emphasis on processing, marketing and consumption. While the public institutions have focused on standard setting, regulation, promotion and policy, the private sector comprising formal and informal groups has focused on production, processing, marketing and input supply. The existing institutional and regulatory frameworks in the sector amount to a multiplicity of actors with multiple roles, requiring rationalization and coordination for the growth of the sector and specifically benefit the smallholder producer. The dairy sector is crucial for rural development, poverty alleviation in rural and urban areas, food and nutritional security and increased household incomes. Kenya is one of the largest producers and consumers of dairy products in Africa and the sector is largely based on smallholder production. Kenya produces enough milk for local consumption and exports some dairy products to the region and internationally as she becomes increasingly more self-sufficient in milk and milk products.

Like maize, wheat and dairy, beef has faced similar policy environment whereby processing and marketing logistics were controlled through a parastatal monopoly, KMC, until liberalization in the late 1990s and post-2002 economic revitalization policies. The collapse (for 15 years) and eventual revival of KMC saw export of beef and beef products increase after 2006, time during which policy allowed private players into the beef sector. Currently commercial companies command a substantial portion of the value chain following liberalization and changing policy environment, with their products being far more prominent compared to public corporation like KMC's. The beef sector in Kenya is considered heterogeneous, independent, with a multiplicity of local terminal markets and meat traders-termed as "disorganized", This leads to diminishing their capacity for value addition and representing an important barrier to entry into high end market and export opportunities. In addition, the beef value chain suffers the problem of lack of traceability and control of animal production rendering it vulnerable to disease outbreaks. The pastoral livestock production systems in Kenya accounts for 80–90% of red meat production in relation to cattle ranches/agro-pastoral and highlands production/mixed systems. These production systems have clear distribution channels implying that shocks in a production system could cause significant disruptions in specific markets. Kenya is not self-sufficient in meat and caters for the deficit from neighbouring countries, although she is generally considered an exporter of live cattle.

The Kenyan horticultural sector has largely been private sector driven, a trait attributable to its success so far, despite having not had a policy to guide its growth and sustainability prior to the National Horticulture Policy-2012. Nevertheless like the rest of the agricultural sector, the horticulture subsector has operated within the prevailing national policy regime shifts discussed earlier. In Kenya, vegetables are produced mainly by smallholder farmers. The vegetable trade and value chain in Kenya faces a number of hurdles resulting in limited processing of the produce, and consequent limited value-addition which compromises their competitiveness as well as producers' incomes. However, the government has put in place policy through which programs and projects will be implemented to mitigate these hurdles.

The agricultural sector faces a number of challenges. They broadly relate to: farmer support in terms of inputs, institutions and technological capacity; improvement of land use and productivity; infrastructure; commercialization and diversification of agriculture; value addition enhancement for agricultural exports and marketing; as well as trade matters related to multiple levies, tariffs and non-tariff barriers. Agricultural produce market access and marketing infrastructure are poorly organized and inadequate and potential for value addition of dairy, beef and vegetables among others remain largely untapped. Despite the challenges, through various policy and strategy implementation, the government has made some attempt to adopt agricultural technologies to improve productivity, empower agricultural extension officers, encourage farmers to embrace farming as a business, easing farmers' access to inputs, and funding a creating partnerships between farmers and agricultural stakeholders. Government policies to promote commercial, market-oriented and profitable agriculture to raise incomes and increase food security in Kenya are also supported through high levels of public expenditure. We observe that Kenya is moving towards policy coherence whereby agricultural sector policies have gradually adapted to the country´s general policy and political changes towards market liberalization, privatization and commercialization of the agricultural sector. This is reflected in the downward coherence and continuity between national strategies, sector policies and policies related to other supportive sectors. Through overall policy guidance and support, the government has shown commitment towards the achievement of food security, poverty reduction, employment creation and incomes.

4 Food standards and labelling policy

4.1 Introduction

The objective of this Chapter is to analyze Kenya's food standards and labelling policy. The Chapter focuses on standards and labelling policies with a special focus on GMOs among others. This has entailed inquiry on: International commitments such as WTO SPS and TBT Agreements; National Food Standards and in particular those that are relevant; and the reaction of government to international private food standards such as Global Good Agricultural Practices (GAP) in terms of assistance and adaption. The Chapter also investigates whether the government promotes domestic GAPs and assesses what needs to be labelled, what does not and in particular the GMOs and the traceability of respective products. The discussion is approached from a food sustainability perspective in terms of what is lacking, what is good and what should be improved.

4.2 Food Standards and Labelling Policy

According to CODEX Alimentarius (2010), food means any substance, whether processed, semi-processed or raw, which is intended for human consumption, and includes drink, chewing gum and any substance which has been used in the manufacture, preparation or treatment of "food" but does not include cosmetics or tobacco or substances used only as drugs. The Kenya Bureau of Standards (KEBS) (2016) defines a standard as a technical document detailing the criteria necessary to ensure that a material, product, service, or procedure is fit for the purpose it was intended. Standards serve as a guide for production of goods and provision of services, and are a basis for trade transactions.

The Dictionary of Food and Nutrition (2005) defines a food standard as a set of criteria that a food must meet if it is to be suitable for human consumption, such as source, composition, appearance, freshness, permissible additives, and maximum bacterial content.

CODEX Alimentarius (2010), states that food standards can be categorized as mandatory or voluntary. Mandatory standards are generally set by Governments in the form of regulations, which include technical requirements such as testing, certification and, labeling. They are enforced by liability rules of non-compliance.

Voluntary standards are set through formal coordinated approaches of key stakeholders in the supply chain (business associations, Non-Governmental Organizations (NGO) initiatives or are developed and monitored by individual companies). Private standards are voluntary and are observed by Kenyan associations. They originate from foreign markets targeted by the associations. Such standards include Kenya Global Agricultural Practices (GAP) among others.

Supranational standards originate from regional organizations and are mandatory just as national standards (Carey, 2008). There are trade restrictions/barriers due to non-conformity with the standards.

International standards are voluntary but act as benchmarks for national standards. In formulating national standards, priority for reference is given to relevant CODEX and other international standards (e.g. SPS text or TBT text) to provide the platform on which national standards may be adopted or adapted to suit the national food safety situation. Other reference materials include regional and other

national standards (of other countries), laws and regulations. Such references help harmonize national standards with other standards and technical regulations ultimately to protect consumers and promote fair trade.

Kenya is a member of the World Trade Organization (WTO) and other international organizations and must therefore adhere to the rules, regulations and standards and commitments set by these organizations. At the regional level, Kenya is also a member of the East African Community and trade among the member states is governed by the rules and regulations that are contained in the East African Community Protocol.

4.3 Technical Barriers to Trade Agreement

Kenya is a member of the World Trade Organization and it is therefore a signatory to various international commitments and agreements that emanate from the WTO. One such commitment is the WTO (1995) Technical Barriers to Trade Agreement (TBT) which aims to ensure that technical regulations and standards[11], and conformity assessment procedures are non-discriminatory and do not create unnecessary obstacles to trade. At the same time, it recognizes WTO members' right to implement measures to achieve legitimate policy objectives, such as the protection of human health and safety, or protection of the environment. The TBT Agreement strongly encourages members to base their measures on international standards as a means to facilitate trade. Through its transparency provisions, it also aims to create a predictable trading environment.

Article 2 of the WTO (1995) TBT Agreement on the Preparation, Adoption and Application of Technical Regulations[12] by Central Government Bodies with respect to their central government bodies, the Agreement states that members should ensure that in respect of technical regulations, products imported from the territory of any member should be accorded treatment no less favorable than that accorded to like products of national origin and to like products originating in any other country. It also states that members should ensure that technical regulations are not prepared, adopted or applied with a view to or with the effect of creating unnecessary obstacles to international trade. For this purpose, technical regulations should not be more trade-restrictive than necessary to fulfill a legitimate objective; taking account of the risks non-fulfillment would create. Such legitimate objectives are, among others national security requirements; the prevention of deceptive practices; protection of human health or safety, animal or plant life or health, or the environment. In assessing such risks, relevant elements of consideration are; available scientific and technical information; related processing technology or intended end-uses of products.

Section 2.4 of Article 2 of WTO (1995) TBT Agreement states that where technical regulations are required and relevant international standards exist or their completion is imminent, Members should use them, or the relevant parts of them, as a basis for their technical regulations except when such

[11] A Standard is a document approved by a recognized body that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory. It may also include or deal exclusively with terminology, symbols, packaging, marking or labeling requirements as they apply to a product, process or production method (WTO, 1995, TBT Agreement).

[12] A Technical regulation is a document which lays down product characteristics or their related processes and production methods, including the applicable administrative provisions, with which compliance is mandatory. It may also include or deal exclusively with terminology, symbols, packaging, marking or labeling requirements as they apply to a product, process or production method (WTO, 1995, TBT Agreement).

international standards or relevant parts would be an ineffective or inappropriate means for the fulfillment of the legitimate objectives pursued, for instance because of fundamental climatic or geographical factors or fundamental technological problems.

On the other hand, section 2.6 of the WTO (1995) TBT Agreement states that with a view to harmonizing technical regulations on as wide a basis as possible, Members should play a full part, within the limits of their resources, in the preparation by appropriate international standardizing bodies of international standards for products for which they either have adopted, or expect to adopt, technical regulations while section 2.11 of the same document states that members should ensure that all technical regulations which have been adopted are published promptly or otherwise made available in such a manner as to enable interested parties in other Members to become acquainted with them.

Article 3 of the TBT Agreement on Preparation, Adoption and Application of Technical Regulations by Local Government Bodies and Non-Governmental Bodies within members territories states that Members should take such reasonable measures as may be available to them to ensure compliance by such bodies with the provisions of Article 2, and that Members are fully responsible under this Agreement for the observance of all provisions of Article 2. Members should formulate and implement positive measures and mechanisms in support of the observance of the provisions of Article 2 by other than central government bodies.

Article 4 of The TBT Agreement on Preparation, Adoption and Application of Standards section 4.1 states that Members should ensure that their central government standardizing bodies accept and comply with the Code of Good Practice for the Preparation, Adoption and Application of Standards in Annex 3 to the Agreement which is referred to in the Agreement as the Code of Good Practice. Members are expected to take such reasonable measures as may be available to them to ensure that local government and non-governmental standardizing bodies within their territories, as well as regional standardizing bodies of which they or one or more bodies within their territories are members, accept and comply with this Code of Good Practice. In addition, members should not take measures which have the effect of, directly or indirectly, requiring or encouraging such standardizing bodies to act in a manner inconsistent with the Code of Good Practice. The obligations of Members with respect to compliance of standardizing bodies with the provisions of the Code of Good Practice should apply irrespective of whether or not a standardizing body has accepted the Code of Good Practice.

Article 12 of the TBT Agreement on Special and Differential Treatment of Developing Country members section 12.3 states that members shall, in the preparation and application of technical regulations, standards and conformity assessment procedures, take account of the special development, financial and trade needs of developing country members, with a view to ensuring that such technical regulations, standards and conformity assessment procedures do not create unnecessary obstacles to exports from developing country members. Section 12.4 states that members recognize that, although international standards, guides or recommendations may exist, in their particular technological and socio-economic conditions, developing country members adopt certain technical regulations, standards or conformity assessment procedures aimed at preserving indigenous technology and production methods and processes compatible with their development needs. The National Enquiry Point on TBT for Kenya is the Kenya Bureau of Standards (KEBS)

4.4 Sanitary and Phytosanitary (SPS) Measures Agreement

Kenya is also a signatory to the WTO SPS Measures Agreement. The WTO (1995) SPS provisions are mandatory measures covering food safety aspects with the primary objective of protecting human, animal and plant life and health. For members of the World Trade Organization, the development of SPS measures is guided by the following three WTO-recognized standard setting organizations:

1. CODEX Alimentarius Commission (CAC) of the Food and Agricultural Organization (FAO) and the World Health Organization (WHO);
2. International Plant Protection Convention (IPPC); and
3. World Organization for Animal Health (OIE).

According to the WTO (1995) SPS Agreement a Sanitary or phytosanitary measure means any measure applied:

(a) To protect animal or plant life or health within the territory of the member from risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms;

(b) To protect human or animal life or health within the territory of the member from risks arising from additives, contaminants, toxins or disease-causing organisms in foods, beverages or feedstuffs;

(c) To protect human life or health within the territory of the member from risks arising from diseases carried by animals, plants or products thereof, or from the entry, establishment or spread of pests; or

(d) To prevent or limit other damage within the territory of the member from the entry, establishment or spread of pests.

According to the United Nations Conference on Trade and Development (UNCTAD) (2005), Sanitary or phytosanitary measures include all relevant laws, decrees, regulations, requirements and procedures including, end product criteria; processes and production methods; testing, inspection, certification and approval procedures; quarantine treatments including relevant requirements associated with the transport of animals or plants, or with the materials necessary for their survival during transport; provisions on relevant statistical methods, sampling procedures and methods of risk assessment; and packaging and labelling requirements directly related to food safety[13].

This agreement is intended to make sure that food is traded safely and that animal and plant pests or diseases are not spread through trade meaning that import restrictions are sometimes required. The WTO (1995) Agreement on the Application of Sanitary and Phytosanitary Measures seeks to strike a balance between the right of WTO members to protect health and the need to allow the smooth flow of goods across international borders. The Agreement recognizes the right of WTO members to adopt legitimate measures to protect food safety and animal and plant health while ensuring these measures are not applied in an unnecessary manner for protectionist purposes.

The SPS Agreement encourages WTO members to base their standards, regulations and guidelines on the health and safety standards developed by the three relevant international expert bodies as mentioned before, namely the CODEX Alimentarius Commission (for food safety), the International

[13] Food safety refers to all characteristics that are not negotiable, namely food hazards, whether chronic or acute, that may make food injurious to the health of consumers (e.g. microbiological hazards, pesticide residues, misuse of food additives, chemical contaminants, including biological toxins, and adulteration) (BMZ, 2012).

Plant Protection Convention (for plant health) and the World Organization for Animal Health (for animal health and animal diseases transmittable to humans). The United Nations Conference on Trade and Development (2005), reports that the three international bodies come up with standards, guidelines and recommendations:

(i) For food safety, the standards, guidelines and recommendations established by the CODEX Alimentarius Commission relating to food additives, veterinary drugs and pesticide residues, contaminants, methods of analysis and sampling, and codes and guidelines of hygienic practice;

(ii) For animal health and zoonoses, the standards, guidelines and recommendations developed under the auspices of the International Office of Epizootics;

(iii) For plant health, the international standards, guidelines and recommendations developed under the auspices of the Secretariat of the International Plant Protection Convention in cooperation with regional organizations operating within the framework of the International Plant Protection Convention; and

(iv) For matters not covered by the above organizations, appropriate standards, guidelines and recommendations promulgated by other relevant international organizations open for membership to all Members, as identified by the Committee.

The WTO (1995) SPS Agreement reports that to sell a product, the producers and traders must know the health requirements of the market. The SPS Agreement requires WTO members to notify the WTO Secretariat whenever they intend to impose any new or changed requirements that may affect trade. These notifications give trading partners the opportunity to comment on the planned regulations before they are adopted and allow producers to adapt to the new requirements.

Greater transparency in government procedures, including providing the reasons for food safety, animal or plant health measures, means that more information is now available to producers, traders and consumers. By eliminating unnecessary trade barriers, governments allow consumers to benefit from a greater choice of safe foods and from international competition among producers.

The SPS measures Agreement states that each member shall ensure that one enquiry point exists which is responsible for the provision of answers to all reasonable questions from interested members as well as for the provision of relevant documents regarding:

(a) Any sanitary or phytosanitary regulations adopted or proposed within its territory;

(b) Any control and inspection procedures, production and quarantine treatment, pesticide tolerance and food additive approval procedures, which are operated within its territory;

(c) Risk assessment procedures, factors taken into consideration, as well as the determination of the appropriate level of sanitary or phytosanitary protection;

(d) The membership and participation of the Member, or of relevant bodies within its territory, in international and regional sanitary and phytosanitary organizations and systems, as well as in bilateral and multilateral agreements and arrangements within the scope of this Agreement, and the texts of such agreements and arrangements.

Kenya's SPS National Enquiry point is housed in the Kenya Plant Health Inspectorate Services (KEPHIS). The SPS Agreement also states that members should ensure that where copies of documents are requested by interested members, they are supplied at the same price (if any), apart from the cost of delivery, as to the nationals of the member concerned.

Every WTO member has the right to take SPS measures to protect the life and health of its human population, plants and animals and WTO requires that these measures are transparent, based on international standards and science-based, in proportion to the potential risk involved and are equally applied to national and imported products such that there is no domestic and international discrimination. These principles are intended to promote predictable and sustainable trade of which Kenya is part of.

4.5 Cartagena Protocol on Biosafety (2003)

The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international treaty governing the movements of genetically modified organisms[14] (GMOs) resulting from modern biotechnology from one country to another. It was adopted on 29 January 2000 as a supplementary agreement to the Convention on Biological Diversity and entered into force on 11 September 2003.

The Protocol establishes an advance informed agreement (AIA) procedure for ensuring that countries are provided with the information necessary to make informed decisions before agreeing to the import of such organisms into their territory. The Protocol contains reference to a precautionary approach and reaffirms the precaution language in Principle 15 of the Rio Declaration on Environment and Development. The Protocol also establishes a Biosafety Clearing-House to facilitate the exchange of information on living modified organisms and to assist countries in the implementation of the Protocol. Member countries are required to designate competent authorities and National Focal Points (Liaison officers) to deal with national GMO matters and liaise with the international secretariat of Convention on Biological Diversity. Kenya signed the Cartagena Protocol on Biosafety in 2000 and ratified it in 2003.

4.6 Regional Standards

At the regional level, Kenya is a member of Common Market for Eastern and Southern Africa (COMESA) the East African Community (EAC) (East African Community (2007). The East African Community Protocol article 108 on Plant and Animal Diseases Control states that the partner states should:

(i) Harmonize policies, legislation and regulations for enforcement of pests and disease control;

(ii) Harmonize and strengthen regulatory institutions;

(iii) Harmonize and strengthen zoo–sanitary and phytosanitary services inspection and certification;

(iv) Establish regional zoo–sanitary and phytosanitary laboratories to deal with diagnosis and identification of pests and diseases;

(v) Adopt common mechanism to ensure safety, efficacy and potency of agricultural inputs including chemicals, drugs and vaccines; and

(vi) Co-operate in surveillance, diagnosis and control strategies of trans-boundary pests and animal diseases.

---

[14] Genetically Modified Organisms are organisms that possess a novel combination of genetic material obtained through the use of modern biotechnology which includes the application of:

(a) In-vitro nucleic acid techniques including the use of recombinant deoxyribonucleic acid (DNA) and direct injection of nucleic acid into cells or organelles; or

(b) Fusion of cells beyond the taxonomic family, that overcome natural physiological, reproductive and recombinant barriers and which are not techniques used in traditional breeding and selection.

The growing regional trade between Kenya and its regional partners in the East African Community and COMESA presents certain challenges especially in terms of food safety and quality across the entire cross border value chain in order to protect human, animal and plant life. This has entailed the development of common SPS protocols that aim at promoting inter and intra-regional trade. Both EAC and COMESA have found it necessary to develop Quality Infrastructure (QI).

The EAC has also developed the East African Standards (EAS), a comprehensive set of harmonized technical regulations that are mandatory and voluntary standards. COMESA has adopted the EAS standards to prevent duplication.

According to BMZ (2012), the draft COMESA SPS Logical Protocol has four result areas namely:

1. Common certification schemes/protocols and private sector driven regional standards adopted for selected food and agricultural products;
2. Monitoring, surveillance and emergency preparedness programmes established for priority animal diseases and plant pests;
3. SPS information exchange improved within and among Regional Economic Communities (RECs) and between public and private sector, at national and regional level; and
4. Improved regional leadership, coordination and collaboration on SPS issues.

As can be deduced from the above, COMESA's SPS Protocol signifies an important step towards the adoption of SPS obligations stipulated in the WTO principles by proposing common approaches for:

5. Setting up structures and procedures for supporting equivalence and risk analysis;
6. Developing mechanisms for monitoring and surveillance of human food-borne illnesses and zoonoses;
7. Establishing reference laboratories (three reference laboratories are already in place: for animal health in Zambia, for plant health in Mauritius and for food safety in Kenya);
8. Adopting measures for zonation and compartmentalization as outlined in the World Organization for Animal Health (OIE) regulations (zonation and compartmentalization offer the opportunity to continue trading from disease-free compartments during periods of disease outbreak in a country or zone; through adherence to strict bio containment procedures, record keeping and trading partner agreements);
9. Agreeing on commitments relating to pesticides, quarantine, adoption of good agriculture practices (GAP) and good manufacturing practices (GMP), phytosanitary inspections and the establishment of early warning system, etc.;
10. Recommending the adoption of Hazard Analysis and Critical Control Point (HACCP) principles and pre-requisites; and
11. Recommending the application of traceability systems (BMZ, 2012).

The COMESA SPS protocol creates the COMESA Green Pass (CGP), which is a commodity-specific certification scheme for the movement of food and agricultural products within the region and provides for region-specific product and process standards encompassing the entire value chain.

4.7 Private Food Standards

Private voluntary standards are commercial trade and industry standards. These are developed by individual firms (corporate standards) or by business networks and associations (collective standards in a bid to homogenize product attributes and to facilitate the coordination of market transactions or

to differentiate products. Some of these private standards as stated in BMZ (2012) are: Global-GAP/KenyaGAP, Tesco Nature's Choice, East African Grain Council (EAGC), Ethiopian Horticulture Producers and Exporters Association (EHPEA) Code of Practice for Sustainable Flower Production, East African Business Council (EABC); East African Community Business Guide on Sanitary and Phytosanitary Measures and Standards; Fresh Produce Exporters Association of Kenya (FPEAK), corporate standards for example of dairy or meat processors (e.g. in Kenya) and so on. There could also be non-commercial third party standard schemes used by trade and industry that are developed by non-governmental organizations and cover sustainability issues or address specific social and ecological issues, for example, Fair Trade, Rainforest Alliance, Utz Certified, organic (e.g. Demeter, Naturland), and others (BMZ, 2012).

4.7.1 Kenya Good Agricultural Practice (GAP)

The Kenya GAP is a private standard owned by the Fresh Produce Exporters Association of Kenya (FPEAK) serving private and public food safety and quality interests. The Kenya GAP benchmarks internationally with the global GAP and it has raised the reputation of the Kenya horticultural export sector through industry self-regulation in supplying both the regional and domestic market. The Kenya GAP domestic and regional scope means adaption to small holder capacities with full recognition and adoption of Global GAP (Carey, 2008).

The Fresh Produce Exporters Association of Kenya joined forces with the Kenya Plant Health Inspectorate Servicesto assist supermarket chains to establish preferred supplier schemes for farmers complying with the Kenya GAP Domestic Scope, which was introduced in 2009. The objective is to reach a critical mass of smallholder producers to improve on production and harvesting practices.

In 2007, Kenya GAP was launched and became the first standard in Africa, benchmarked to the internationally recognized GLOBAL GAP standard for fruit, vegetables and flowers.

When the Kenya GAP development process was launched, the Kenyan Ministry of Agriculture, Kenya Plant Health Inspectorate Service and the Kenya Bureau of Standards were the main government departments to become involved.

Whilst the legislative framework was not adapted to directly reference the Kenya GAP standard, the government provided information, technical expertise and nominal support to the Kenya GAP development process. The government's role was to mobilize the key players to participate in the development of the Kenya GAP standard as they facilitated and mobilized the participation of relevant stakeholders by setting-up and running the private-public sector initiative, the National Task Force on Horticulture (Carey, 2008).

In 2009, the Kenya Bureau of Standards accepted Kenya GAP certification as equivalent to its own approval for the local market Kenya Horticultural Competitiveness Program (KHCP), and therefore, under Green Pass, Kenya could, put KEBS forward as its national Green Pass authority. KEBS would have the full right to accept Kenya GAP protocols as its own (i.e., as the regionally accepted national standard). This means active public-private collaboration on standards, with multi-stakeholder private bodies has taken a major role in defining the details of workable and appropriate standards. Further public partners, besides KEBS and KEPHIS, are the Ministry of Agriculture and the Horticultural Crops Development Authority (HCDA).

4.7.2 GLOBALGAP

GLOBALGAP, formerly known as EurepGAP, changed its name in 2007. It was founded in 1997 for and by European retailers with the aim of establishing one global reference standard for Good Agricultural Practice. Currently GLOBALGAP members include retailers, producers/farmers and associate members from the input and service side of agriculture.

The GLOBALGAP standard is a pre-farm-gate standard, which means that it addresses the process of production until the product leaves the farm. It is based on the principles of risk prevention, risk analysis and Hazard Analysis Critical Control Point. Environmental sustainability focuses on Integrated Pest Management (IPM) and Integrated Crop Management (ICM).

The GLOBALGAP standard is described as a single integrated standard with modular applications covering different product groups. The Integrated Farm Assurance Standard covers horticultural crops as well as livestock and aquaculture.

The GLOBALGAP standard is a pre-farm-gate standard, which means that it addresses the process of production until the product leaves the farm. It is a business-to-business label not directly visible to consumers (Carey, 2008). Global GAP was established to provide optimal farm productivity by using resources available (Kirago, 2015).

European retailers sell produce that is grown both in Europe and imported from third countries, and have come to require the same GLOBALGAP standards from all their producers, regardless of their location. This has at times created tensions in developing countries where the standards have been perceived to act as a barrier to access the European market. In Kenya however, the horticultural sector viewed GLOBALGAP as an opportunity to coalesce and strengthen itself (Carey, 2008). Kenya signed the GLOBALGAP standards in Geneva in December 2016.

4.8 National Food Standards

The Republic of Kenya (2011) National Food and Nutrition Security Policy reports that the responsibility for ensuring food safety and quality in Kenya is divided amongst twelve regulatory Ministries, Departments and Agencies (MDAs) and food safety and quality is governed by twenty Acts of Parliament implemented by the different agencies. However, the major responsibility lies with the Department of Public Health, Government Chemist, Kenya Bureau of Standards, Department of Veterinary Services and Kenya Plant Health Inspectorate Service, among others. Key laws that deal with food safety include the Public Health Act Cap 242 of the Laws of Kenya, Food, Drugs and Chemical Substances (FDCS) Act Cap 254 of the Laws of Kenya, and the Standards Act Cap 496 of the Laws of Kenya. Most of these Acts are not in conformity with current international standards and guidelines and need to be revised and adapted based on the Hazard Analysis Critical Control Point and good manufacturing practices.

Although Kenya lacks a defined and published policy on food safety as part of a wider National Food and Nutrition Policy (Republic of Kenya, 2011), there exists food laws designed to protect the consumers. The food safety control agencies operate under the Ministries of Trade, Industrialization, Public Health and Sanitation, Livestock, Fisheries Development, and Agriculture (Oloo, 2010). A summary of the legal and policy framework of these agencies and the implementing mechanisms for the laws is documented by FAO/WHO, 2005 (FAO/WHO, 2005). The agencies include Kenya Bureau of Standards, Kenya Agricultural Research and Livestock Organization (KARLO), Kenya Plant Health

Inspectorate Services, Department of Public Health (DPH), Weights and Measures Department, Government Chemist's Department, Department of Veterinary Services (DVS), Kenya Dairy Board (KDB), and Horticultural Crops Development Authority, among others (Global Agricultural Information Network GAIN, 2005). The functions of these agencies include sensitization and implementation of codes of hygiene and agricultural practices by stakeholders throughout the food chain (FAO/WHO, 2005). Despite these, Kenya experiences major problems of non-compliance with basic food safety and agricultural health practices in local markets. The level of awareness of the said practices among small producers is negligible (World Bank, 2005).

Standards for food and agricultural products in Kenya are developed by technical committees with their secretariats at KEBS (Kenya Bureau of Standards, 2015). Food standards give specifications for the compositional requirements, microbial requirements, the tolerance limits for contaminants, packaging, labelling and the hygiene conditions necessary for manufacture of products. Kenyan standards are derived from the CODEX Alimentarius Commission – CODEX, the International Organization for Standardization (ISO) and guided by the WTO Sanitary and Phytosanitary Standards (food safety issues) and Technical Barrier to Trade agreements (food quality[15] issues).

The SPS and TBT Agreements state that every member states should have a national enquiry point, while the Cartagena Protocol on Biosafety requires member countries to have National Focal Points to deal with GMOs. In Kenya, the National enquiry point for SPS/TBT Agreements and the National CODEX contact point is the Kenya Bureau of Standards (KEBS) and KEPHIS while the National Focal Point for the Cartagena Protocol on Biosafety is the National Biosafety Authority (NBA). In Kenya, the Biosafety Act of 2009 established the National Biosafety Authority. The main features of the Biosafety Act include: Prohibition of anyone dealing with a GMO (e.g. for research, manufacture, production, commercial release and import) unless licensed by the National Biosafety Authority for contained use or intentional release into the environment; Sets up NBA as the National focal point of all Biosafety matters in Kenya; and Establishment of the NBA Board.

The mandate of NBA is to exercise supervision and control over the development, transfer, handling and use of genetically modified organisms (GMOs) with a view to ensuring and assuring safety of human and animal health and provision of an adequate level of protection of the environment. The regulations in the Act cover activities involving importation into, exportation out of and movement of GMOs through Kenya.

Article 18 of the Biosafety Act of 2009 states that, “a person shall not conduct any activity involving GMOs without written approval from the Authority”. Articles 4(1); 5(1) and 6 (1) state the following:

(a) A person wishing to import, export or transit a GMO shall apply for and obtain written approval from the Authority;

(b) A person transiting shall ensure GMO is packaged and transported as per Kenyan Laws; and (c) Transit GMO goods require prior approval by the receiving country.

(c) In enforcing the Biosafety Act, the National Biosafety Authority collaborates with a number of regulatory agencies as specified in the Biosafety Act.

[15] Food quality includes all other product attributes that influence a product’s value for consumers, including positive attributes such as the origin, colour, flavour, texture and processing method of the food and negative attributes such as spoilage, contamination with filth, discoloration, off-odours (BMZ, 2012).

These agencies include:

12. Department of Public Health;
13. Department of Veterinary Services;
14. Kenya Bureau of Standards;
15. Pest Control Products Board;
16. Kenya Plant Health Inspectorate Service;
17. National Environmental Management Authority (NEMA);
18. Kenya Wildlife Service (KWS); and
19. Kenya Industrial Property Institute (KIPI).

However, the national food standards applied in Kenya are: Kenya Bureau of Standards; Kenya Plant Health Inspectorate Services; Kenya Dairy Board; and Horticultural Crops Development Authority (HCDA).

As mentioned before, Kenya also subscribes to private standards such as Kenya Fish Processors and Exporters Associations (AFIPEK); Kenya Organic Agriculture Network (KOAN); Fresh Produce Exporters Association of Kenya; Kenya Association of Manufacturers (KAM); Global Agricultural Practices, Kenya Good Agricultural Practices and so on.

The regional standards applied in Kenya include African Plant Protection Organization (APPO); Inter-African Phytosanitary Council (IAPSC); African Regional Organization for Standardization (ARSO); East African Standards Committee (EASC); Common Market for East and Southern Africa, and so on.

The international standards applied in Kenya include the WTO recognized standards such as SPS and TBT): CODEX Alimentarius Commission (CAC); World Organization for Animal Health (OIE); International Plant Protection Convention (IPPC) and others, such as International Organization for Standardization (ISO), International Electrotechnical Commission (IEC), United Nations Economic Commission for Europe (UN/ECE) and so on.

However, even with all these laws on standards, there are still reports of goods being traded in Kenya that do not meet any of the above mentioned standards meaning that they could be injurious to the consumers. Some of these products are mainly those produced by small scale producers who may not be aware of the standards required in production, processing, storage and distribution.

4.9 Labelling Policy: Labelling Regulations, 2012

The Kenya Law Report (kenyalaw.org) states that in Kenya, all matters related to marking, labeling, and packaging are governed by the Food, Drugs, and Chemicals Substances Act; the Biosafety Act of 2009; the Biosafety (labeling) Regulations of 2012; the Food Labeling, Additives, and Standard Regulations; and the Weights and Measures Act. The implementation of this Act is under the responsibility of:

20. The Ministry of Public Health and Sanitation,
21. Kenya Bureau of Standards, and
22. The Department of Weights and Measures.

This institutional setting is intended to prevent the consumer or purchaser from being misled about the quality, quantity, character, value, composition, and the effect of products in Kenya. All items traded in Kenya should be labeled with metric measurements, and packaged.

It is mandatory that all foodstuffs must be labeled in English or Kiswahili and manufacturers must indicate on the labels of all consumables the date of manufacture and of expiry. Except for paints packed in tubes or boxes, commonly sold as artists' or children's paints, imports of pre-packaged paints and allied products must be sold by metric weight or metric fluid measure. Labeling on pharmaceuticals should include: therapeutically active substances, inactive ingredients, name and percentage of any bactericidal or bacteriostatic agent, manufacture and expiry dates, batch number, any warnings or precautions, name and business address of manufacturer, and product registration number. Banana leaves, maize, rice, sorghum or wheat straw, and bags containing or having contained malt, soil or leaf mould must not be used as packing material. However, small scale producers and processers find it expensive to include such details in their products or they are not aware of such requirement of the law.

4.10 Traceability and Labelling of GMOS

The International Organization for Standardization (ISO) (2007) ISO 22005:2007 defines traceability as ability to follow the movement of a feed or food through specified stage(s) of production, processing and distribution. ISO (2007) explains the principles and requirements for the design and implementation of a feed and food traceability system. This standard allows organizations operating at any step of the food chain to:

23. Trace the flow of materials (feed, food, their ingredients and packaging);
24. Identify necessary documentation and tracking for each stage of production;
25. Ensure adequate coordination between the different actors involved;
26. Improve communication among the involved parties, and most importantly;
27. Improve the appropriate use and reliability of information, effectiveness and productivity of the organization.

The CODEX Alimentarius Commission (CAC) (2006) defines traceability or product tracing as the ability to follow the movement of a food through specified stage(s) of production, processing and distribution. CAC also set out principles for traceability as a tool within a food inspection and certification system.

The scope of the Biosafety Labeling regulations, 2012 widely differs among countries as mandatory labeling requires different coverage and threshold value. Threshold value refers to the maximum level (in per cent) of unintentional, technically unavoidable GMO content in seed, food, or feed that does not need to be labeled. The labeling threshold is a reliable benchmark that enables food and feed producers to distinguish between agricultural products from the different cultivation systems and place them on the market accordingly.

In Kenya, the Biosafety (Labelling) Regulations, 2012 were gazetted through Legal Notice No, 40 of 25th May, 2012. The objective of the regulations are to ensure that consumers are made aware that food, feed or a product is genetically modified so that they can make informed choices and to facilitate the traceability of GMO products to assist in the implementation of appropriate risk management measures where necessary. In other words, there must be a traceability system in place.

Traceability of GMO means the ability to trace genetically modified organisms and products at all stages of their placing on the market through production and distribution chains through a unique identifier or batch/lot number. A unique identifier means a simple numeric or alphanumeric code which serves to identify a genetically modified organism on the basis of the authorized transformation even

from which it was developed and providing the means to retrieve specific information pertinent to that genetically organism. Traceability is a risk-management tool which allows food business operators or authorities to withdraw or recall products which have been identified as unsafe (Banerjee and Menon, 2015).

A food traceability system enables to follow the movement of any food product by documentation of each point of food handling. When an incident occurs, the food traceability system could efficiently assist in the recall of the food product(s) in question and assist in the investigation of the cause. Also transmitting and verifying the relevant information would contribute to increasing reliability on the information of the label and so on, and thus enables consumers to purchase food with a sense of security.

Many developed countries have implemented new legal requirements for traceability, and exporting countries are under pressure to comply with the regulations set up by importing countries. The CODEX Alimentarius Commission states that:

The traceability/product tracing tool should be able to identify at any specified stage of the food chain (from production to distribution) from where the food came (one step back) and to where the food went (one step forward), as appropriate to the objectives of the food inspection and certification system" (CODEX Alimentarius Commission, 2006).

Traceability can be used as a tool to achieve 3 main objectives:

(i) Managing risks related to food safety and animal/plant health issues;
(ii) Guaranteeing product authenticity and providing credible information to customers, and
(iii) Improving quality and processes of products by identifying noncompliance (Germain, 2003).

Traceability of GMOs can be achieved through the labelling process. The labelling applies to products consisting of, or containing GMOs or food or feed produced from GMOs. The Kenya system thus applies to both the product and the production process. The threshold for labelling in Kenya is 1 per cent meaning that any food, feed or their ingredients containing approved GMO or derived products with more than 1 per cent GMO presence has to be labelled.

The Labeling Regulations require that operators shall ensure that:

(a) For pre-packaged products, the words 'genetically modified (name of ingredient)' or 'genetically modified (name of food)' appear on a label;
(b) For non-pre-packaged products the words 'genetically modified organisms' or 'genetically modified (name of organism(s)' shall appear on, or in connection with, the display of the product.

The Regulations states that the National Biosafety Authority shall liaise with the relevant regulatory agency (KEBS) to monitor any genetically modified organisms for compliance with the requirements of these Regulations.

In Kenya, concerns on safety of GMOs is still an important topic countrywide as evidenced by the government ban on all GMO foods in 2012[16] until such a time that there is sufficient information, data and knowledge demonstrating that GMO foods are not a danger to public health citing the discredited

[16] On November 21, the Kenyan Ministry of Public Health (MOPH) ordered Public Health Officials to remove all genetically modified (GM) foods on the market and to enforce a ban on GM imports following a November 8 Kenyan Cabinet and Presidential decree.

Seralini study released by a French university in September 2012 that linked cancer in rats to the consumption of GM foods (Snipes and Kamau (2012). In response to public demands and expectations, the NBA Management declared that the Year 2013 would be the "Year of National Biosafety Advocacy" in Kenya. However, in January 2016, the country's National Biosafety Association approved Monsanto's genetically-modified, drought-resistant corn for field trials by Kenya Agriculture and Livestock Research Organization that would test whether it is safe and has sufficient nutritional value hence moving closer to introducing genetically modified crops into Kenyan fields.

4.11 Challenges

In Kenya the regulations and standards are hardly implemented along local and regional value chains. This is mainly due (1) to lack of awareness of consumers including all value chain operators on food safety issues and sometimes newspapers report of whole families falling sick or dying because of consuming uninspected meat. (2) Also, low income among consumers makes them base their purchase decisions on prices and not on food safety and quality. A casual check in a supermarket in up market Nairobi by the author found only one item of green grams indicating that it was GMO free. (3) There is an also limited capacity of the national institutions responsible for controlling compliance with plant protection, animal health and food safety provisions to adapt and adopt international or regional standards and enforce national regulations and standards. (4) There is lack of awareness on food safety and quality issues and (5) Lack of incentives for value chains operators from inputs, through farming, trading and processing up to retailing to invest into good practices and quality assurance systems further to basic visual product quality attributes. (6) The informal nature of food production and the fact that they are small scale producers would find it very expensive investing in food standards it therefore means that these standards are more applicable to large scale food handlers.

4.12 Conclusion and Policy Recommendations

From the foregoing, it is clear that Kenya's food standards, like standards for other products, are enforced through the Kenya Bureau of Standards, but this is not as effectively enforced as would be expected for food for domestic consumption. A good example is the recent introduction of plastic rice into the Kenyan market, an occurrence that is bound to jeopardize the health of Kenyans, especially since there is no labeling to determine which type of rice a consumer is purchasing.

On the other hand standards for agricultural production for export are enforced throughout the value chain due to dangers of loss of markets if production standards are not met. Food and other products for export are thus of good standards and are adequately labeled due to industry enforcement more than government enforcement.

Even with the government coming up with the labeling and traceability systems, there are certain challenges in implementing traceability and labeling systems in the Kenyan context.

Some of these challenges are:

- Installing and implementing a traceability system involves costs in terms of technology and software costs, services costs, changes in processes and operating costs. For many small and medium enterprises in Kenya, these costs can be quite significant and become a huge burden to the small scale farmers and enterprises who supply the domestic market with no immediate payback.

- Most small scale farmers unlike large scale farmers in Kenya that are in the food supply chains lack the capacity and skills to provide the necessary information and training to create traceability documentation and to put in place the requisite systems and processes.
- Different requirements of different suppliers, and different documentation makes traceability complicated and time consuming efforts for small scale farmers supplying the domestic market.
- Record keeping obligations can be excessively difficult for small scale famers to comply with due to high levels of illiteracy. Small scale farmers most often cannot guarantee the provision of traceability or the record keeping on the maintenance of standards which goes with it.

This therefore implies that traceability systems favor large scale producers and vertically-integrated enterprises and that Kenyan consumer could be consuming GMO products without knowing.

5 Seed and inputs rights (intellectual property rights)

5.1 Introduction

The objective of this chapter is to investigate the intellectual property rights with regards to seeds and other inputs. The chapter looks at the intellectual property rights in the context of seeds and inputs and explores in detail the history of intellectual property rights; the international commitments related to intellectual property for example, the WTO TRIPS Agreement, the International Union for the Protection of New Varieties of Plants (UPOV) 78 to 91 Agreements. We also investigate how these international commitments have been implemented in Kenya and the international human rights commitments related to seeds and input rights and examine which rights Kenyan farmers have to propagate or replant seeds. The discussion on this chapter is from a food sustainability/human rights perspective in order to understand whether there is there a problem, what needs to be done and what is lacking.

We start by first discussing the Kenya seed policy after which we also discuss the stakeholders in the seed sector. We then define and discuss intellectual property rights from a historical perspective and then discuss intellectual property rights from a Kenyan perspective and its impact on the Kenya seed sector in the various food systems and from a food sustainability point of view.

5.2 Kenya Seed Policy

The National Seed Policy of 2010 outlines interventions that aim to address constraints in the seed sector with a view to contributing to agricultural productivity. It starts by admitting that seed is one of the most critical inputs of agricultural production and has the potential of increasing on-farm agricultural productivity and enhancing food security.

The National Seed Policy of 2010 also recognizes that Kenya has got two seed systems: the formal and informal seed systems. The formal component is served by government initiated research programs for some benefactor food and cash crops. Lumped within the informal seed system component are farm-saved seed, seeds purchased, multiplied or marketed locally between farmers and, seed accessed through civil society organizations, or imported by unregistered seed dealers, and relief agencies. The description of the informal seed system in the National Seed Policy 2010 is not followed by any policy detail on whether the system either requires attention or support or to be abolished.

Use of farm-saved seed, and seed obtained either through farmer-to-farmer exchange and local markets is identified as a problem. Whereas the specific problem presented by these seeds is not pointed out in the policy itself, it is apparent from the Strategy for the Revitalization of Agriculture (SRA) that the quality of these seeds is the perceived problem. Seed certification is presented as the main tool effecting quality control. To enhance certification the policy proposes registration of all actors in the seed value chain (including relief seed suppliers) and prescription of stiffer penalties for those flouting certification procedures. There is also a call for the continued support of public breeding institutions to maintain varieties and produce seed for those varieties not attractive to the private sector. Targeting informal seed systems is a proposed policy on provision of advisory services with a view to transforming it to the formal sector (National Seed Policy, 2010). While the nature of advisory services are not expounded, the policy calls for strengthening of farmer extension and advisory services with a view to making farmers appreciate the benefits of using good quality seed. It is expected that through these services this transformation to formal will occur.

According to the Government of Kenya (GOK) data, Kenya's use of certified seed totaled nearly 47,500 metric tons in 2010, with nearly 90 per cent domestically produced. Domestically produced maize seed dominates the market, but imported vegetable seeds have been growing over the years. Kenya produces only small amounts of vegetable seeds due to underdeveloped seed propagation programs for vegetables. Vegetable seeds account for the largest share of the planting seed import market. Other crops where commercial seed sales occur include flower, pasture, and maize seeds.

The Kenya Seed Company (KSC), a state corporation, produces over 80 per cent of Kenyan certified maize seeds. There are 85 registered seed companies currently operating in the country.

The GOK has implemented a program of distributing free seed and fertilizer to many small-scale farmers. In addition, the GOK began promoting local seed production through the National Seed Policy. The National Seed Policy identified four priority areas:

1. Provide financial support to research, extension, variety and species development, and technology transfer;
2. Facilitate coordination between public and private sectors on research;
3. Review variety evaluation, release and registration procedures;
4. Implement clear and transparent processes to access varieties and plant species.

5.3 Stakeholders in the Seed Sector in Kenya

There are six major Acts of Parliament governing the seed sector. These laws are administered principally by the Kenya Plant Health Inspectorate Service (KEPHIS), Pest Control Products Board (PCPB), and the National Biosafety Authority (NBA). They include the Seeds and Plant Varieties Act Cap 326; the Plant Protection Act Cap 324; the Suppression of Noxious Weeds Act Cap 325; the Agriculture Produce (Export) Act Cap 319; Pest Control Products Act (Cap 346); and the National Biosafety Act No. 2 (2009).

Only registered seed traders are allowed to import seed into Kenya. They must complete a seed regulation form (SR-14) and obtain a plant import permit (PIP) from KEPHIS as a pre-requisite for seed importation. Seed certification in Kenya is governed by the Seeds and Plant Varieties Act (Chapter 326 of the Laws of Kenya) and is guided by International Seed Testing Association (ISTA) rules of seed testing and the Organization of Economic Cooperation and Development (OECD) seed certification schemes. The certification process includes field registration, seed crop inspection during active growth, seed processing, seed laboratory testing, labeling and sealing, post control, and post certification survey.

All seed imported into the country must fulfill ISTA requirements in addition to satisfying the relevant phytosanitary measures including laboratory quality tests upon arrival. Kenya's membership to OECD seed certification schemes and ISTA rules of seed testing enables trade with other member countries. However, majority of Kenya's trading partners in Africa are not members of either OECD seed certification schemes or ISTA rules of seed testing. Within the East African Community, Kenya and Uganda subscribe to OECD seed certification schemes but only Kenya subscribes to ISTA rules of seed testing. This makes cross-border seed trade difficult as the neighboring countries are not compliant to international seed certification standards. As a result, Uganda is the largest export market for Kenyan seeds, though the market remains small.

As a signatory of the International Union for the Protection of New Varieties of Seeds (UPOV) 1978 system, the GOK tests, registers and protects new varieties of plants in accordance with UPOV requirements and regulations in the Seeds and Plant Varieties Act (Cap 326). This ensures protection of plant breeders' rights from unauthorized production or propagation of protected varieties, and unauthorized sale/marketing activity.

Moreover, the GOK provides for trademark and brand name registration in Kenya. The Kenya Industrial Property Institute (KIPI) registers products via an application process. Trademarks are registered for ten years initially, but may be renewed indefinitely upon request.

The Government of Kenya does not allow imports of genetically modified (GM) seeds for commercial use. However, imported seeds are duty-free although importers must pay an import declaration fee of 2.25 percent of the cost, insurance, and freight (CIF) value; and handling and documentation charges of 0.65 percent of the CIF value.

There are a number of stakeholders in seed production, distribution and marketing in Kenya. These are:

28. Research Institutions such as Universities,
29. Kenya Plant Health Inspectorate Service (KEPHIS)
30. Ministry of Agriculture
31. Seed Trade Association of Kenya (STAK)
32. Plant Breeders Association of Kenya (PBAK)
33. Kenya National Federation of Agricultural Producers (KNFAP)
34. National Seed Quality Control Service (NSQCS)
35. Agricultural Development Corporation (ADC)
36. Horticultural Crops Development Authority (HCDA)
37. Commodity Research Centre (CRC)
38. Kenya Agriculture and Livestock Research Organization (KALRO)
39. Kenya Forestry Research Institute (KFRI)
40. Non-governmental Organizations (NGOs)
41. Community Based Organizations (CBOs)

Others are seed companies that conduct research, production, processing and marketing of seed; import, re-package and market seed and others who import and market seed. Other stakeholders are agents, sub-agents stockists who are outlets and distributors of seed.

5.4 Intellectual Property Rights: Definitions

World Intellectual Property Organization (WIPO) (nd) defines Intellectual Property as creations of the mind such as inventions, literary and artistic works and symbols, names and images used in commerce. WIPO categorizes intellectual property into two categories. These are industrial property and copyright. Industrial Property includes patents for inventions, trademarks, industrial designs and geographical indications. Copyright covers literary works (such as novels, poems and plays), films, music, artistic works (e.g., drawings, paintings, photographs and sculptures) and architectural design. Rights related to copyright include those of performing artists in their performances, producers of phonograms in their recordings, and broadcasters in their radio and television programs (http://www.wipo.int/about-ip/en/).

So what are intellectual property rights (IPR)? Wekesa (2009) notes that IPRs are premised on a Western philosophy of property ownership that seeks to reward an individual, who is considered to have worked hard to contribute to the good in society. However, WIPO (nd) contends that intellectual property rights are like any other property right. They allow creators, or owners, of patents, trademarks or copyrighted works to benefit from their own work or investment in a creation. These rights are outlined in Article 27 of the Universal Declaration of Human Rights, which provides for the right to benefit from the protection of moral and material interests resulting from authorship of scientific, literary or artistic productions.

5.5 History of Intellectual Property Rights from an International Perspective

The importance of intellectual property was first recognized in the Paris Convention for the Protection of Industrial Property in 1883 and the Berne Convention for the Protection of Literary and Artistic Works in 1886. Both treaties are administered by the World Intellectual Property Organization.

The World Intellectual Property Organization was established in 1970 and is dedicated to helping ensure that the rights of creators and owners of intellectual property are protected worldwide, and that inventors and authors are therefore recognized and rewarded for their ingenuity. This international protection acts as a spur to human creativity, pushing back the limits of science and technology and enriching the world of literature and the arts. By providing a stable environment for marketing products protected by intellectual property, it also oils the wheels of international trade.

WIPO works closely with its Member States and other constituents to ensure the intellectual property system remains a supple and adaptable tool for prosperity and well-being, crafted to help realize the full potential of created works for present and future generations (http://www.wipo.int/about-ip/en/).

WIPO is part of the United Nations system of specialized agencies, and it serves as a forum for its Member States to establish and harmonize rules and practices for the protection of intellectual property rights. WIPO also services global registration systems for trademarks, industrial designs and appellations of origin, and a global filing system for patents. These systems are under regular review by WIPO's Member States and other stakeholders to determine how they can be improved to better serve the needs of users and potential users (http://www.wipo.int/about-ip/en/).

WIPO (nd) gives several reasons for promoting intellectual property. These are:

42. The progress and well-being of humanity rest on its capacity to create and invent new works in the areas of technology and culture.
43. The legal protection of new creations encourages the commitment of additional resources for further innovation.
44. The promotion and protection of intellectual property spurs economic growth, creates new jobs and industries, and enhances the quality and enjoyment of life.
45. An efficient and equitable intellectual property system can help all countries to realize intellectual property's potential as a catalyst for economic development and social and cultural well-being.
46. The intellectual property system helps strike a balance between the interests of innovators and the public interest, providing an environment in which creativity and invention can flourish, for the benefit of all.

Intellectual property rights reward creativity and human endeavor, which fuel the progress of humankind (http://www.wipo.int/about-ip/en/).

Opati (2009) contends that intellectual property rights are tools for economic advancement that should contribute to the enrichment of society through the widest possible availability of new and useful goods, services and technical information that derive from inventive activity and also through the highest possible level of economic activity based on the production, circulation and further development of such goods, services and information. The author argues that intellectual property rights provide incentives towards various creative endeavors of the mind by offering protection; giving such creators official recognition; creating repositories of vital information and facilitating the growth of both domestic industry or culture and international trade.

5.6 History of Intellectual Property Rights in Kenya

Wekesa (2009) notes that Kenya has had a long history of Intellectual Property protection with the first patent registered in the country in 1912 using the laws of England since Kenya was a British colony and this went on until 1989. The Kenya Industrial Property Office (KIPO) was created in 1990, when the Industrial Property Act was enacted. KIPO was given the mandate of examining, granting and registering industrial property rights under the provisions of the Industrial Property Act and the Trademarks Act Cap. 506.

The Trade Related Intellectual Property Rights (TRIPS) form the basis of intellectual property rights in Kenya. In the 1970 and 1980s, the group of 77 (G77) developing countries started agitating for relaxation of the intellectual property regime at the time so that they could acquire technology cheaply. This was part of their push for a New International Economic Order. Some multinational companies in Japan and the United States at that time were feeling that the existing intellectual property rights regime was not stringent enough to protect their business interests. They therefore lobbied, together with other countries for the intellectual property rights to be included in the General Agreement on Trade and Tariffs (GATT) negotiations. This led to the signing of the TRIPS Agreement by WTO member states in 1994 (Wekesa, 2009).

TRIPS are compulsory for member states and they have a mechanism for sanctions for non-compliance. So Kenya, being a member of the WTO did not have an alternative but to domesticate TRIPS provisions which came into effect in Kenya on 31st December 1999 when the Kenya Industrial Property Office (KIPO) initiated procedures to review the 1989 industrial Property Act as a way to fulfilling the country's obligations under TRIPS. The KIPO has now been renamed the Kenya Industrial Property Institute (KIPI). However, Kenya being a signatory to the WTO had to amend the Industrial Property Act on 13th June 2001 to conform to the TRIPS and WIPO guidelines. It is important to note that the Industrial Property Act does not include patents on seeds as these are covered under the Seeds and Plant Varieties Act CAP 323 Laws of Kenya which came into force in 1975 and revised in 2012. Intellectual property laws give seed companies exclusive monopoly over their products and these companies are seen as pro-competitive as each seed is a new product.

This law aims to: regulate transactions in seeds, including provision for the testing and certification of seeds; provide guidelines for the establishment of an index of names of plant varieties and to empower the imposition of restriction on the introduction of new varieties and control the importation of seeds and provide for the granting of proprietary rights to persons breeding or discovering new varieties.

The Act also grants plant breeders in plant variety exclusive rights to produce reproductive material of the variety for commercial purposes. Any infringement thereof is actionable and the owner of the right is entitled to damages, injunction, and account for profits. It is also an offence under the Act to make false representation or give false information regarding the exercise of plant breeders' rights. This attracts either a fine not exceeding 6,000 Kenya shillings or imprisonment of up to six months or both. A body corporate is liable too for any offences committed by or attributable to its officers in this regard (Laws of Kenya Chapter 326, Seeds and Plant Varieties Act, Subsidiary Legislation).

In the Seeds and Plant Varieties (Plant Breeder's Rights) (Vegetables Scheme) Regulations, 2001, the Act says that a person who infringes the plant breeder's rights in the registered name of a variety of vegetable covered by the Vegetables Scheme commits an offence and is liable to a fine of three thousand Kenya shillings or to imprisonment for a term of three months or to both. The period for which the intellectual property right is exercisable is give as 15 years for all vegetables. The period or years prescribed before compulsory licensing ranges between 1 and 2 years for different types of vegetables.

In the Seeds and Plant Varieties (Plant Breeder's Rights) (Maize Scheme) Regulations, 2001, the period for which plant breeder's rights is exercisable in respect of the plant varieties is fifteen years while the class of plant varieties prescribed for the purposes of section 21 of the Act consists of all plant varieties of maize, sweet corn and popcorn. The prescribed period before compulsory licensing is not supposed to have effect for a period of two years after the date of grant of rights in that variety. A person who infringes the plant breeder's rights in the registered name of a variety of maize covered by the Maize Scheme commits an offence and is liable to a fine of three thousand Kenya shillings or to imprisonment for a term of three months or to both.

Wheat is also covered by the Seeds and Plant Varieties (Plant Breeder's Rights) (Other Cereals Scheme which applies to cereals other than maize) Regulations, 2001 in the Act. The period for which plant breeder's rights are exercisable is 15 years while the prescribed period before compulsory licensing is not supposed to have effect for a period of one year after the date of grant of rights in that variety of wheat. A person who infringes the plant breeder's rights in the registered name of a variety of wheat covered by the Other Cereals Scheme commits an offence and is liable to a fine of three thousand Kenya shillings or to imprisonment for a term of three months or to both.

5.7 African Regional Intellectual Property Organization (ARIPO)

Kenya is also a signatory to the ARIPO Protocol for the Protection of New Varieties of Plants which was adopted by the Diplomatic Conference that was held in Arusha in the United Republic of Tanzania on July 6-7, 2015. The Arusha Protocol seeks to provide Member States of ARIPO with a regional plant variety protection system that recognizes the need to provide growers and farmers with improved varieties of plants in order to ensure sustainable Agricultural production http://www.aripo.org/about-aripo/legal-framework).

However, the regional instruments by ARIPO in the Arusha Protocol does not reflect any specific measures to protect and promote farmers' rights in spite of provision of that sort existing in the Plant Treaty. Nevertheless, the protection granted to plant breeders appeals more to the large scale farmers or large scale investment in seed production and the fate of the local small scale farmers is sealed. This has widened the gap between access to new plant varieties by local small scale farmers and protection of breeders' rights in these new varieties. It also exposes the country to food insecurity since production of seed is left to private seed companies out to make profits without any regards to food security.

5.8 International Union for the Protection of New Varieties of Plants (UPOV)

Apart from the Seeds and Plants Varieties Act CAP 326 Laws of Kenya, seed and plant reproduction in Kenya is also governed by the International Union for the Protection of New Varieties of Plants. UPOV was established by the International Convention for the Protection of New Varieties of Plants ("UPOV Convention"). The UPOV Convention was adopted on December 2, 1961, by a Diplomatic Conference held in Paris.

The UPOV Convention came into force on August 10, 1968, having been ratified by the United Kingdom, the Netherlands and Germany. The UPOV Convention was revised on November 10, 1972, on October 23, 1978, and on March 19, 1991, in order to reflect technological developments in plant breeding and experience acquired with the application of the UPOV Convention. States and certain intergovernmental organizations wanting to accede to the UPOV Convention have laws on plant variety protection in line with the 1991 Act of the Convention.

On May 11th 2016, the International Convention for the Protection of New Varieties of Plants (UPOV Convention) of December 2, 1961, as revised on March 19, 1991 entered into force in Kenya. Kenya was the first country in Africa to join UPOV when it became a member on May 13th 1999 and subsequently domesticated the 1961 Act of the UPOV Convention in the Kenya Seed and Plant Varieties Act Cap 326.

The entering into force of UPOV 1991 in Kenya is a significant development for both plant breeders' rights as well as farmers' rights. Compared with UPOV 1961, the 1991 revision of the Convention is characterized by a widening of the scope of rights granted to breeders, a narrowing of the breeders' exemption and a lengthening of the duration of plant variety protection.

Article 14.5 of UPOV 1991 narrows the breeders' exemption by requiring right-holder authorization when a new variety is "essentially derived" from a protected variety, i.e. if the new variety is very similar to the parent variety or if one requires the repeated use of the protected variety for producing the new variety.

Article 14.1 expands the scope of the breeders' right to cover any form of production or reproduction (multiplication), conditioning for the purpose of propagation, offering for sale, selling or marketing, exporting, importing, or stocking for any of the above purposes. In other words, the scope of the right under UPOV 1991 extends to include any use of the protected variety for propagation purposes. With regard to duration of plant variety protection, the right conferred was lengthened from a period of 15 years under Article 8 of UPOV to a minimum period of 20 years.

It is clear that the UPOV Convention in particular UPOV 1991 were created with reference to developed world farming practices or large scale farming systems for exports. Most small scale farmers in Kenya usually use seed saved from previous harvests as planting material. This freedom that farmers can exercise in relation to protected plant varieties seems to be restricted by UPOV 1991and therefore puts Kenya into conflict with its international obligations under the International Treaty on Plant Genetic Resources for Food and Agriculture (the Plant Treaty) ratified on June 29th June 2004. This therefore implies that Kenya's move from UPOV 1961 to UPOV 1991 means that rights of farmers are generally marginalized and subordinated to the rights of breeders.

The UPOV and PVP systems are exclusively aimed at supporting formal seed systems and ignores the informal farmer led seed system. Also UPOV 1991 is likely to affect the informal sector as it does

not allow for the exchange of farm-saved seed of protected varieties through the sales of seed surpluses on the local market (De Jonge, 2014).

What makes UPOV and breeders' rights especially tricky is the way they work in concert with other large scale systems of governance and policy. In particular, trade and investment agreements are now being used to strong arm developing nations to effect policies promoting the seed industry, and actively demoting farmer-bred and local varieties. Nearly all countries, Kenya included, are now part of the World Trade Organization (WTO) whose Trade Related Aspects of Intellectual Property Rights requires that all member nations adopt minimum standards of intellectual property protection. Countries are fulfilling this requirement by joining UPOV like Kenya did in April 2016, establishing PVP laws and, in some cases, even stricter national-level laws for IP protection. Trade laws and investment agreements also work against farmer seed by restricting state procurement. The impact on rural livelihoods and biodiversity is especially great when local food is grown from local, farmer-bred seed (Montenegro, 2015).

Nevertheless compliance with UPOV 1991 will benefit Kenya's horticultural sector but it will hurt food crops as the UPOV 1991 framework does not provide a sufficient balance between the exclusive rights of breeders and the rights of farmers to save, exchange and trade protected planting material.

5.9 Different Methods of Seed and Plant Breeding

There are different methods of seed and plant breeding and each method relies on different concepts, processes and funding mechanisms. The outcomes of each of these methods are also different and there are also different methods of dissemination of the varieties of seeds and plants that results out of these methods. Seeds and plant breeding can be done informally by farmers or formally by scientists. Kenya's seed sector is made up of different seed systems. A seed system may include any individual or institution undertaking breeding research, selection, development, production, multiplication, processing, storage, diffusion, distribution and marketing of seeds which are all interrelated. Hence a seed system incorporates the different ways by which farmers can access seed, including the different actors involved in the seed chains.

Kenyan farmers, particularly smallholder farmers, are involved in multiple seed systems, which help them obtain the seed they need. These multiple systems are either formal or informal or both. When seed/plant breeding, seed production and distribution are all organized and undertaken by public or commercial actors, then that could be referred to as the formal seed system. On the other hand, the informal system is defined as the total of farmers' seed production, selection and seed exchange activities. We start by analyzing the informal farmer led methods of seed and plant breeding before analyzing the formal methods by scientists.

5.9.1 Informal Farmer led Methods of Seed and Plant Breeding

On-farm plant breeding activities of farmers usually form part of their general agricultural practices and include operations such as exchange and procurement, cleaning, mixing, storing and selecting seed (Christinck, 2002). The farmers' seed management thus not only aims at the reproduction of more or less identical seed for the next season, but also includes various steps that may gradually or dramatically alter the genetic composition of the seed. It includes all actions taken by farmers that might influence the genetic composition and viability of the seed: during storage, before sowing, during cultivation and after harvest.

Most times farmer led seed and plant breeding is just part of the farmer's agricultural activities and applies mainly to those crops where the harvested part can be used for subsequent sowing, as is the case for cereal and grain crops, as well as potatoes and many other root and tuber crops. In other crop species, particularly some vegetable crops, more specialized activities are required for successful propagation; however, all these procedures were and continue to be applied by many farmers as part of their yearly routine.

Farmers usually plant mixed crops of different varieties in the same field and the genetic composition of the seeds and plants changes due to cross pollination. Apart from mixing different local varieties and seeds from different sources, farmers also use improved varieties and hybrids from the formal plant breeding sector as components of such mixtures and of course the genetic make-up of the resultant seeds and plants is different from the original varieties.

Selection done by farmers is usually based on visual observation of traits such as post-harvest, culinary and nutrition-related traits, or relies on other human senses. They actively seek to increase the frequency of some desired traits in their local varieties, or observe and select off-types to form new sub-populations of an existing variety (Christinck, and Tvedt, 2015).

Farmers' seed management practices are not systematically applied in a similar way year after year. They are flexibly adapted depending on the seasonal variability of conditions and actual needs. A further feature of the farmers' approach to plant breeding is that all operations are not done by one person alone. Seed does not only travel along many hands within one family: it also travels along their social networks. Seed is exchanged, sold, borrowed and given away, pooled with other seed lots, both within a village community and beyond. It is essentially collective in nature (Christinck, and Tvedt, 2015).

5.9.2 Limitations of Farmer Managed Seed and Plant Breeding Systems

47. Significant productivity gains through farmer breeding alone are not very likely to occur, unless there is access to breeding materials with new sources of variability for relevant traits.
48. The farmers' breeding and selection progress is less pronounced for traits with low frequency, low heritability, or the presence of which cannot easily be observed by the means that are available to the farmers.
49. In the farmers' collective breeding system no special remuneration is usually paid to those who engage in the breeding process since the practice of sharing seed is usually embedded in social norms and systems of reciprocity.

5.9.3 Formal Scientific Seed and Plant Breeding

Christinck and Tvedt (2015) argue that scientific plant breeding includes methods and insights that are not generally available to small-scale farmers. These include:

(1) Access to the global pool of genetic resources provided by gene banks, and the related information systems;
(2) Scientific methods to discover the presence or non-presence of traits that are not easily observed visually or by using human senses;
(3) Technical possibilities for targeted crossing or isolation of single plants or populations, particularly where crossing does not easily occur naturally or at a low rate, or where isola-tion requires technical equipment and knowledge;

(4) Methods for conducting and evaluating trials that allow for predictions of performance under diverse growing conditions;

(5) Methods that allow for predictions with regard to the heritability of traits.

Most times, the improved varieties lead to improved yields per hectare and this could also lead to a higher seed price for improved varieties from the formal sector, provided that the benefits exceed increased production costs.

In most cases, the scientific methods are not very well developed in developing countries and those that exist are usually privately funded by the private sector and those that are publicly funded also depend on donor funds that farmers as clients of these breeding programs do not have to pay for the breeding process itself. The problem here is that public breeding programs are thus in general committed to goals pursued by their donors meaning that policy priorities of the governments or donors, such as food and nutrition security, or benefits for particular user groups may be relegated to the back burner.

The private sector breeding initiatives do not receive public funds for their investments, unless engaged in public-private partnerships (PPP), or otherwise supported directly or indirectly by pub-lic funding schemes (e.g. seed subsidies). Therefore, farmers as clients of private breeding programs have to pay for the service provided to them, so that there is a flow of financial capital that provides a return on investment, and an incentive for further breeding work in the future. The flow of financial capital is realized through exclusive rights for marketing seed of protected varieties, with royalties to be paid to the holder of the intellectual property right included in the final seed price.

The private breeding sector thus relies on ex post funding of their breeding work, and hence relies on a certain market volume and effective targeting of potential clients' needs. This funding mechanism explains the importance of PVP for the private breeding sector. Plant Variety Protection provides the basis on which claims for license fees can be grounded. Hence, IPR for plant varieties is regarded as a basic requirement for the private sector to engage in seed and plant breeding. However, La Via Campesina and GRAIN (2015) argue that laws that grant property rights over seeds have been reinforced by other regulations that are supposed to ensure seed quality, market transparency, prevention of counterfeits and so on. These regulations include seed certification, marketing and sanitary rules. By means of these regulations, it becomes mandatory, for instance, for farmers to purchase or use only commercial seeds tailored for industrial farming.

In Kenya, seed certification is carried out by the Kenya Plant Health Inspectorate Services (KEPHIS) as per standards stipulated in The Seeds and Plant Varieties (Seeds) regulations under CAP 326. KEPHIS is mandated to:

- Co-ordinate all matters relating to crop pests and disease control;
- Establish service laboratories to monitor the quality and levels of toxic residues in plants, soils and crop and animal produce;
- Administer Plant Breeders Rights (PBR) in Kenya and serve as a liaison office for the International Union for the Protection of new Varieties of Plants, thus, the custodian of the Plant Breeders' Rights Register;
- Undertake inspection, testing, certification, quarantine control, variety testing and description of seeds and planting materials;
- Undertake grading and inspection of plants and plant produce at the ports of entry/exit;

- Develop and implement standards on both imported and locally produced seeds;
- Approve all importation and exportation licences for plants and seeds;
- Implement the national policy on the introduction and use of genetically modified plant species, insects and microorganisms in Kenya;
- Establish posts at convenient locations for quarantine, inspection and quality control of fertilizer and seeds and monitor levels of residues of agricultural inputs and their environmental effects; and
- Establish linkages for collaboration with various local and international government and non-governmental organisations so as to execute its tasks more professionally.

Under the Kenyan seed law, there are crops that fall under voluntary certification (Schedule I), and those under compulsory certification (Schedule II).Those under compulsory certification are shown in Table 1.

Table 1: Crops under Compulsory Seed Certification

Number	Group	Crops
1	Cereals	maize, wheat, barley, sorghum, millet, oats, triticale, rice
2	Pulses	Beans (dry), beans (green podded), peas, cowpeas, pigeon peas
3	Oil crops	sunflower, oil-seed rape, linseed, soya beans, sesame
4	Grasses	setaria, Rhodes grass, Sudan grass, Congo signal, panicum sp
5	Pasture legumes	Centro, Stylo, Desmodium, Clover, Lucerne, Siratro, Lupins
6	Root crops	Irish potato
7	Cotton	
8	Tea	
9	Sugarcane	
10	Coffee	

Source: Republic of Kenya (2013), Kenya Gazette Supplement No 28, The Crops Act 2013, No. 16

However, the Seed Crops Act 2013 gives the Cabinet Secretary for Agriculture powers to alter the list of crops under compulsory certification and it has been increased from the initial 6 to the current 9. On the other hand, there are crops that are under voluntary seed certification category. These are Bananas, French beans, Silver leaf desmodium, Green leaf desmodium, Coloured guinea grass, Pyrethrum and Cassava. Others in this category are Sweet potato, Kenaf, Sesame, Safflower, Ground nut, Pigeon pea, Dolichos bean, Cowpea and Chick peas. Seeds with no breeding program are shown in Table 2.

Table 2: Crops with no Breeding Program

Oats	Oil seed rape	Rye grass	Amaranth	Chicory	Karella	Pumpkin / Squash /Courgette
Rye	Flax	Sudan	Artichoke	Chinese cab-bage	Kohlrabi	Radish
Triticale	Beet	Love grass	Asparagus	Chirvil	Leek	Rhubarb
Broad beans	Turnip	Bermuda grass	Sugar beet	Collards / Kale	Lettuce	Rutabaga
Cluster bean	Other flower species	Butterfly pen	Broccoli/cauli-flower	Corriander	Okra	Spinach
Pea	Blue stem grass	Centrosema	Brussels sprouts	Cucumber	Onion	Swiss chard
Common Vetch	Buffel grass	Clover	Cabbage	Dill	Parsley	Tomato
Castor bean	Cock's foot	Leucaena	Canteloupe / Muskmelon	Eggplants	Parsnip	Turnip
Jojoba	Columbus grass	Siratro	Carrot	Endive	Pea	
Linseed	Paspalum grass	Stylosanthes	Celery / Celer-iac	Garden cress	Pepper	

Source: Republic of Kenya (2013), Kenya Gazette Supplement No 28, The Crops Act 2013, No. 16

5.9.4 Difference between the Informal Farmer Managed Seed System and Formal Scientific Seed System

In most developing countries Kenya included, informal farmer managed seed systems provide more than 80 per cent of the seed used in food crops (Food and Agricultural Organization (FAO), 2004). Christinck, and Tvedt (2015) contend that the most important source of seed worldwide is the farmer's own harvest, followed by seed obtained from neighbors and relatives, and from traders, local markets and fairs.

The hybrid varieties have a built-in protection against re-use, as they have to be reproduced from parent lines that are not freely available, and they lose their properties if simply re-sown. Since seed production in the formal seed system is a specialized activity that has to comply with quality standards and involves distribution costs, the seed price is generally higher than the normal grain price. In the case of protected varieties, the breeders' license further increases the seed price. This means, however, that the largest share of the seed price in the formal system does not derive from the IPR as such, but rather is related to the production and distribution cost for certified seed.

Seed from the formal sector can only be purchased for cash, typically in agro-vet shops and outlets of seed producing companies. However, if farmers do not have sufficient cash to buy certified seed at the time of sowing, they have to take a loan, either from a bank, a SACCO or a local money lender.

On the other hand, in the farmer managed seed systems, the majority of all seed transactions take non-monetary forms. That means that farmers, if not from their own harvest, can get seed as gifts from relatives or neighbors (Christinck and Tvedt, 2015).

In some cases, the same amount of grain has to be returned after harvest, or payment can be made in kind or in exchange for services (e.g. seed for work). Whether or not a person has to pay for seed depends on the social relationship between the person who gives and the person who requests seed.

Thus seed either has no price, or the price does not exceed the normal grain price, except where local traders are involved and offer seed grain separately from food grain.

The lower seed cost, along with flexible modes of payment and social practices and obligations that facilitate access to seed even if a person does not have cash, contribute to the importance of farmer managed seed systems for poor and disadvantaged groups of farmers and especially so for food security since there is usually an interchangeability system between seed grain and food during emergency situations.

Christinck and Tvedt (2015) argue that the prevailing opinion that quality of seed from informal sources is generally poorer than seed from the formal system is not supported by scientific evidence as shown by a study by Deu et al. (2014) who found that recycling an improved sorghum variety over several years using different farmer practices did not negatively affect grain yield performance relative to commercial seed.

Also, farmer managed seed system provides seed of many crops and varieties that have so far been neglected by the formal plant breeding and seed system and therefore their continued cultivation depends entirely on the farmers. Hence the farmer managed seed system is of particular importance for those crops where formal activities are not found and in situations where traditional varieties of major food crops for example rice, maize and potatoes play an important role in local production systems.

Therefore, setting up new laws and rules using plant variety protection laws that limit farmers' customary practices of accessing seed, including in emergency situations may have a negative impact on food and nutrition security, sustainability and resilience of farming and food systems. This is because laws can affect different groups of farmers in different ways, depending, for example, on their ability to have cash at the time needed, and the crops they use. It may also impact negatively on their human rights since plant variety protection laws can interfere to some extent with these seed systems, depending on how far they restrict the farmers' use of seed in the case of protected varieties (Christinck and Tvedt, 2015).

5.10 International Human Rights and Plant Variety Protection

This section tries to bring out the relationship between human rights such as the right to adequate food, the right to enjoy the benefits of scientific progress and its applications, gender equality and the rights of indigenous people and intellectual property rights. These human rights are legally binding to all the countries both developed and developing whether they are members of the International Covenant on Economic, Social and Cultural Rights (ICESCR), or not. The right to adequate food is enshrined in the ICESCR (Christinck and Tvedt, 2015). The Committee on ICESCR emphasizes that state and all members of society including individuals, civil society organizations and private business enterprises have responsibilities in the realization of the human rights. However, the state should provide an enabling environment conducive to the universal fulfillment of economic, social and cultural rights. This therefore means that states have a responsibility to protect these rights in their implementation of the Union for the Protection of New Varieties of Plants variety protection.

There are certain minimum requirements for the realization of the ICESCR. For example, protection from starvation, for which it is a duty of governments to ensure them at all times, including in cases of economic downturn or other emergencies; regularly monitoring and assessing the progress made in

the implementation of the plans and strategies of ICESCR; obligation of non-retrogressive measures, implying that states should not allow the existing level of protection of economic, social and cultural rights to deteriorate unless there are strong justifications for a retrogressive measure (United Nation, 2008).

Article 11 of the United Nations (2008) ICESCR, states as follows:

1. The States Parties to the present Covenant recognize the right of everyone to an adequate stand-ard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions. The States Parties will take appropriate steps to ensure the realization of this right, recognizing to this effect the essential importance of international co-operation based on free consent.
2. The States Parties to the present Covenant, recognizing the fundamental right of everyone to be free from hunger, shall take, individually and through international co-operation, the measures, including specific programs, which are needed:
   (a) To improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources;
   (b) Taking into account the problems of both food-importing and food-exporting countries, to ensure an equitable distribution of world food supplies in relation to need.

It is clear that article 11.2 directly refers to agricultural production and food systems and is geared towards adequate food and food security implying food being accessible for both present and future generations hence the issue of sustainability. This therefore means that states should be careful rest their economic and agricultural policies interfere with these rights.

Kenya has incorporated the right to food into its constitutions. In fact, Article 43 of the constitution establishes Kenyans' right “to be free from hunger and have adequate food of acceptable quality”. The right to food is part of the International Covenant on Economic, Social and Political Rights and is a fundamental aspect of human dignity www.kenyalaw.org/lex/actview.xql?actid=Const2010.

Studies done on the impact of UPOV in Kenya, Peru and the Philippines identified certain risks to the right to adequate food. These risks are:

(a) Restricted access to seed (financially and physically);
(b) Sub-optimal dissemination of protected variety seed;
(c) Fewer coping strategies;
(d) Risk of low yields; and less household income (The Berne Declaration, 2014).

These negative effects could occur because new varieties of seeds and plants increase the cost of production and although the yields might be higher than that of local varieties, if the costs are higher than the benefits, and if no viable alternatives such as farmer managed seed breeding systems are available to the small scale farmers, the right to food would be negatively impacted if a country joins UPOV. It may also be that the benefits are not equally distributed even among the new variety adopting members.

However, Christinck and Tvedt (2015) argue that states can adopt certain measures to hedge against such risks. Some of these measures are:

(a) establish or strengthen agricultural knowledge and extension systems targeting the situation of vulnerable groups (to improve or adapt coping strategies);

(b) establish exemptions for small-scale farmers in national PVP law, or provide alternative options for accessing seed of protected varieties (to counterbalance suboptimal dissemination);

(c) promote breeding of well adapted varieties for local production conditions and nutritional needs of specific user groups, e.g. via public breeding initiatives (to increase yields and other benefits); or

(d) Take other measures to secure incomes of small-scale farmers and vulnerable groups, including market based approaches (e.g. promote value chain development, insurance) and direct measures (subsidies, social security benefits, etc.).

The right to enjoy the benefits of scientific progress and its applications as enshrined in Article 15.1(b) of the United Nations (2008) ICESCR and is thus a legally binding right for the state parties of the ICESCR: can also be impacted negatively by the introduction of new protected seed and plant varieties when a state joins UPOV. Article 15 of the United Nations (2008) ICESCR states that:

1. The States Parties to the present Covenant recognize the right of everyone:

(a) To take part in cultural life;

(b) To enjoy the benefits of scientific progress and its applications;

(c) To benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.

It is important to remember that scientific advances can significantly increase crop yields, but they can also reduce crop genetic diversity, widen the gap between poor farmers and large-scale producers, and thus affect the right to food (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2009).

World Conference on Human Rights in Vienna in 1993 termed as the Vienna Declaration of 1993 and the Venice statement (United Nations Educational, Scientific and Cultural Organization, 2009) that emphasize that science has different meanings and implications in different contexts, and that processes, products and applications of science should be used for the benefit of all humanity without discrimination, particularly with regard to disadvantaged and marginalized persons and communities such as women. This means therefore that the intellectual property regimes on seed and plant breeding should be managed in accordance with common responsibility to prevent the unacceptable prioritization of profit for some over benefit for all. This implies that there should be policy intervention to ensure that marginalized groups have unrestricted access to information and the benefits of seed and plant breeding varieties produced by applying scientific methods. They also have a right to participate in decision making regarding the scientific methods used in seed and plant breeding.

Regarding the right to benefit from scientific progress and its applications, it is important that countries that join UPOV must ensure that scientific breeding progress is accessible to small-scale farmers, particularly vulnerable groups; that the scientific progress reaches the vulnerable groups in practice and ensure that the process of implementation for UPOV Plant Variety Protection laws complies with human rights standards and principles, especially with regard to participation in decision-making.

This can be done by allowing traditional practices of small scale farmers to access protected seed varieties through farmer managed seed systems. Governments can also ensure access of protected seed and plant varieties by offering subsidies to small scale poor farmers so that they can buy these varieties at prices that are affordable to them.

Governments can also invest in publicly funded breeding initiatives for the benefit of small scale farmers or certain groups of farmers such as women who are not sufficiently reached by existing private breeding programs. Public breeding programs can team up with international agricultural centers, Non-Governmental Organizations (NGOs), Community Based Organizations (CBOS) and so on in order to promote transparency and participatory decision making at all stages of the seed and plant breeding program.

These initiatives would entail using an Integrated Seed Sector Development (ISSD) approach. An Integrated Seed Sector Development approach takes cognizance of the fact that formal seed systems in seed sector development programs expect informal seed systems to gradually evolve into formal and commercial systems. It also emphasizes the plurality of seed systems that exist in a particular country or region, recognizing that farmers typically gain access to seed from different seed systems. The Integrated Seed Sector Development aims to support all the different seed systems since all have their own benefits and limitations and require a unique approach in strengthening. An Integrated Seed Sector Development approach aims to foster pluralism and guide seed policies and programs in their design to strengthen multiple seed systems. In an ISSD framework, differentiation between rights and limitations for different categories of farmers and crops could be introduced. This will ensure that a blanket implementation of plant breeders' rights does not negatively impact on smallholder farmers, and a pluralistic approach to seed sector development (Louwaars, De Boef and Edeme, 2013).

5.11 Farmers Rights to Propagate and Replant Seeds in Kenya

Munyi and Jonge (2015) argue that over the years Kenya has progressively made some major policy shifts in the agricultural sector and in the process among others, overhauled more than 131pieces of legislation in the sector (Poulton and Kanyinga (2014). The National Seed Policy was adopted in 2010 and the agricultural sector legislation has been reviewed and repealed in relation to crop research systems; plant breeders' rights; and, seed quality systems. Of course these shifts are expected to have a major impact on how the seed systems function and in the process affect farmer practices relating to seed. The policy shifts are also expected to lead the country towards food sufficiency, food sustainability and food security (Poulton and Kanyinga, 2014).

The Seeds and Plant varieties Act CAP 326 has also been reviewed in several areas, and particularly to allow for:

(i) Authorization of some aspects of seed certification to the seed industry;

(ii) Accession to the 1991 UPOV Convention; and

(iii) Effecting more punitive penalties for persons who contravene the Seed Act; Importation of seed from OECD member countries into Kenya under the banner of incomplete certified seed for final certification in the country (Sikinyi, 2010).

When a variety is protected in Kenya, the holder of the plant breeder's rights is entitled to reasonable compensation for anything done during the application period which, if done after the grant of the rights, would constitute an infringement on them. In particular, the rights entitle the holder to prevent anyone doing any of the following acts with respect to the propagating material of the protected variety without his/her authorization, when such a variety is protected:

(i) Production or reproduction (multiplication);

(ii) Conditioning for the purpose of propagation;

(iii) Offering for sale, selling or any marketing activity;

(iv) Exporting or importing; and

(v) Stock for any of the purpose mentioned above.

Under the proposed harmonized regulations under UPOV 1991 which Kenya joined in 2016, the conditions on propagating material include all the above in respect of harvested material, including entire plants and parts of plants, obtained through the unauthorized use of propagating material of the protected variety require the permission of the breeder, unless the breeder has had reasonable opportunity to exercise his/her right in relation to the said propagating material.

The protection may also apply to harvested materials obtained through unauthorized use of propagating material of the protected variety. In case of a variety of a prescribed description, the protection conferred on the holder of plant breeder's rights also applies to any product which is made directly from the harvested material and is of the prescribed description. However, the protection cannot extend to the use by a farmer for propagating purposes in the field, on his own holding, of the product of the harvest which he/she has obtained by planting on his own holding, propagating material of the protected variety (farmers privilege) or a variety which is essentially derived from the protected variety.

Under the Kenyan system, varieties covered by breeder's rights include the protected variety itself, but also those varieties that are not clearly distinguishable from the protected variety as well as varieties that require repeated use of the protected variety. However these provisions also apply in relation to:

(i) Varieties which are essentially derived from the protected variety, where the protected variety is not itself an essentially derived variety;

(ii) Varieties which are not clearly distinguishable from the protected variety; and

(iii) Varieties whose production requires the repeated use of the protected variety.

But there are exceptions to Variety Protection in Kenya. Variety protection is applicable to new varieties of any plant species but not to algae and bacteria. The rights (or protection) do not extend to:

(i) Persons growing or using a protected variety for acts done privately and for non-commercial purposes;

(ii) Use of plants or parts of the protected variety for human consumption or other non-propagating purposes; and

(iii) Use of plants or parts of the protected variety for experimental purposes.

(iv) Acts done for the purposes of breeding other varieties

(v) Farmers privilege to save and replant or exchange seeds harvested from protected variety

Under the present law the farmer's privilege is not included expressly, though in the proposed harmonized law, it has been included and Kenya has to include it after joining UPOV in 2016.

In other words, the scope of the right under UPOV 1991 extends to include any use of the protected variety for propagation purposes. With regard to duration of plant variety protection, the right conferred was lengthened from a period of 15 years under Article 8 of UPOV to a minimum period of 20 years which marginalizes the farmers rights even more.

Kariuki and Templar (2016) report that under Kenya's current system, farmers recycle seed from the previous year's crop because they feel they have no other choice. About 89 per cent of Kenyan farmers plant at least some recycled seed, with 32 per cent planting only recycled seed. This is mainly because of lack of information of new varieties of seeds and also because of ability to afford of new varieties of seeds.

5.12 Conclusion and Way forward

In order to protect Kenyan's human rights as enshrined in the International Covenant on Economic, Social and Cultural Rights, it is important that the Kenya Government comes up with ways and means of making sure that the Kenyan farmer does not suffer in the process of implementing the recommendations of the UPOV 1991. This requires using an integrated seed sector development such that the rights of the farmer as well as the right of the plant breeder are protected. That is combining both formal and informal seed and plant breeding.

The intellectual property regimes on seed and plant breeding should be managed in accordance with common responsibility to prevent the unacceptable prioritization of profit for some over benefit for all implying that there should be policy intervention to ensure that marginalized groups have unrestricted access to information and the benefits of seed and plant breeding varieties produced by applying scientific methods. They also have a right to participate in decision making regarding the scientific methods used in seed and plant breeding in order to avoid introduction of culturally unacceptable products in the seeds or seeds that may contain substances that may be injurious to the health of the citizens as has been alleged in GMO products.

The Kenya Government should allow traditional practices of small scale farmers to access protected seed varieties through farmer managed seed systems by ensuring access of protected seed and plant varieties by offering subsidies to small scale poor farmers so that they can buy these varieties at prices that are affordable to them.

The Kenya Government should also invest heavily in publicly funded breeding initiatives for the benefit of small scale farmers or certain groups of farmers such as women who are not sufficiently reached by existing private breeding programs. Public breeding programs can team up with international agricultural centers, NGOs, CBOs and so on in order to promote transparency and participatory decision making at all stages of the seed and plant breeding program.

Kenya should also be flexible with its seed regulations. For example, locally propagated seed material especially for root and tuber crops are usually in short supply in Kenya mainly because it is expensive to transport. So the Kenya Government should allow KEPHIS supported county level oversight for these crops instead of forcing adherence to national seed certification.

6 Summary, Conclusion and Policy Recommendations

6.1 Summary

This study sought to investigate the prevailing trade conditions in order to understand the extent to which the current food systems have been shaped by Kenya's trade policy and the extent to which Kenya's trade policy is embedded in or restricted by international commitments. It also sought to analyze Kenya's agricultural policy in order to understand the extent to which the Kenya Government is involved in the food processing industry. The study also analyzed Kenya's food standards and labeling policy and investigated the intellectual property rights with regards to seeds and other inputs in Kenya.

The study has used mainly desk search literature search and review. The following documents were reviewed: Government, government agencies and semi-autonomous government agency policy documents; World Trade Organization documents; World Bank documents; Agriculture, Food and Fisheries Authority documents; Food and Agricultural Organization Documents; International Monetary Fund documents; Regional trade integration documents (EAC, COMESA, SADC, OECD, African Union, IGAD, EU-EPA and other related bodies); Published literature covering the four areas of study; Grey literature both published and unpublished; Trade data on exports and imports documents; Export/Imports tariff data documents; Agricultural Policy documents; Kenya Bureau of Standards documents; International/bilateral food standards and labeling policy documents and Kenya Law Reports for relevant Acts.

The document review was complemented with interviews with key stakeholders such as officials in the international trade division in the Ministries of Foreign Affairs and Trade, East African Community, Labour and Social Protection; Industrialization and Trade, Agriculture, KARI, KEPHIS among others. There was also intensive engagements, interactive discussions and exchange/sharing of the information gathered with other researchers (PhD students, supervisors and heads of this and other Work Packages including monthly skypes with Elisabeth Bürgi).

The first objective was addressed by analyzing Kenya's trade policy which has evolved from an import substitution phase that was protectionist before and after independence up to the late 70 and early 80s. In 1984, Kenya adopted trade liberalisation, starting with the World Bank and IMF's Structural Adjustment Programs (SAPs). This championed privatisation that led to limitation of the role of the State in the economy, especially price and input controls and trade in agricultural produce. This led to a focus on production for export, with cash crops prioritised over production of food for domestic consumption, with detrimental impact on national food security. The SAPs phase was followed by an export promotion phase where liberalization and production for export was emphasised. Trade liberalisation continued with Kenya joining the WTO in 1995 and joining WTO's Agreement on Agriculture (AoA). The Vision 2030 phase continued the export promotion emphasis but with subsidies in agricultural inputs especially fertilizer. A number of agricultural policies and strategies were introduced such as the ERS, the ASDS and SRA in order to increase agricultural production and more so to make Kenya food secure. However, even with these policies and strategies, Kenya remains a net food importer especially maize and wheat and the value of its exports are much lower than that of its imports hence operating trade deficits in these products. However, Kenya has been operating a trade surplus in vegetables and beef. It is important to note that beef and vegetables are mainly produced by large scale farmers while maize is mainly produced by small scale farmers. Wheat is also produced by large scale farmers but a few small scale farmers also try to produce some for household consumption.

Kenya signed various trade agreements which are either multilateral or bilateral. It belongs to various regional trade blocks such as EAC, COMESA, and to the Tripartite Agreement between the three regional trading blocs of EAC, COMESA and SADC. It also belongs to IGAD and already signed the EPAs and has trading arrangements with OECD and AGOA.

The second objective analyzed Kenya's agricultural policy and government involvement in the agricultural sector. The study noted that the agricultural sector plays a key role in the food system more specifically in production, processing and consumption. Consequently, the policy framework, governance and economics of food production and processing have important implications on food security and its sustainability. The chapter presented a discussion on Kenya's agricultural policy framework, government involvement in sourcing and processing of maize, wheat, dairy, beef and vegetables, as well as challenges and opportunities. The five commodities were assessed to represent three food systems namely; local (maize), national (wheat, beef and dairy) and international (vegetables).

The agricultural policy in the post-independence (1963-1980s) was implemented by direct government intervention with the main policy objective of achieving food self-sufficiency as echoed in the *Sessional Paper No. 4 of 1981 on the National Food Policy* (NFP). During this period, most of the agricultural production and marketing parastatals such as NCPB, KCC and KMC were under government control. The government was involved in providing subsidies of inputs such as fertilizers and artificial insemination (AI) as well as directly controlling the marketing of these commodities through setting of grain prices, state monopoly of inputs distribution and across the board fertilizer subsidy. The government also set farm-gate and consumer prices for all basic agricultural commodities including maize, maize meal, wheat grains, wheat flour, bread, milk and milk products. In addition, the government engaged in investments in productive infrastructure such as irrigation schemes. In spite of these efforts, the sector was characterized by inefficiencies, poor institutional management dismal performance. We observe that during this period there was substantial government involvement in production and marketing of most agricultural commodities.

During the liberalization period several agricultural commodities' production and marketing suffered following government's eventual withdrawal from pricing and provision of input subsidies and marketing services through various boards and parastatals. Needless to say this had adverse effects on employment, incomes and food security, especially for smallholder farmers. Price deregulations and market liberalization allowed for food imports, while protecting farmers through policy stance such as NFP, ERS, Vision 2030, SRA and ASDS. These policies afforded agriculture high prominence, priority and support, recognizing its role in economic growth in the post liberalization era. They also sought to raise household incomes, create employment and ensure food and nutrition security through creation of favorable institutional operation environment and revival of nearly collapsed agricultural institutions such as KMC, KCC, KSC, AFC and ADC. Within the SRA framework the government considered providing a limited number of goods and services, and a reduced range of regulatory functions that could not be enforced by private self-regulation. To this end agricultural price policies supporting the producers were characterized by a strong Government presence and control of produce and input prices such as price stabilization and producer support prices for maize through NCPB. These policies saw positive developments such as growth in agriculture (6.4% in 2006), reduction of food insecurity and poverty (12% and 10%), and increase in productivity of key commodities (over 6% per annum) during 2003-2007.

Available literature shows that government involvement in sourcing and processing of the assessed products varies, with substantial involvement in crops like maize and wheat to minimal involvement

in horticultural crops like vegetables. Furthermore, the involvement is largely in form of providing the policy guidance and providing conducive legal and regulatory environment within which the sub-sectors operate as well as development of flagship projects and programs for the agricultural and livestock sector. These projects are evident of government involvement in supporting production, processing and marketing of agricultural produce.

Before liberalization in 1989, NCPB had monopoly powers to purchase, store, market and generally manage cereal grains (e.g. maize and wheat) and other produce in Kenya. It was empowered to regulate and control the collection, movement, storage, sale, purchase, transportation, marketing, processing, distribution, import, export, and supply of maize, wheat and other scheduled agricultural produce under a controlled price system. Following government's partial liberalization of the maize market in 1988, Kenya operated two parallel maize marketing systems until 1993 when maize marketing was fully liberalized. These were the unregulated private trade in maize within the country at prices determined by market forces and the official marketing system through the NCPB. NCPB had the mandate of stabilizing prices, maintaining strategic reserves and purchasing maize for relief purposes with the government undertaking ad hoc export bans whenever poor harvests or deficits were anticipated. Kenya's national maize production has over time been outstripped by consumption driven mainly by population growth, necessitating imports considering that maize is a staple crop. Indeed in the early 1990s, Kenya transitioned from a net exporter to net importer in official maize trade. This spells dire implications on the food security situation of Kenyans especially due to high levels of poverty and the attendant high food prices during times of shortages as was recently experienced from April-July 2017 when there was literally no maize flour on the shelves. Besides, the government has a role of promoting domestic production and protecting farmers, while restricting imports through import tariffs and export bans to safeguard food self-sufficiency.

Government involvement especially in terms of policy, legal, regulatory environment and institutional support by way of flagship projects and programs appears to be similar between wheat and maize as stated earlier. Wheat is the second most important grain after maize in terms of both production and consumption and the second most important agricultural commodity in Kenya from a food security view point. Wheat consumption has outstripped production necessitating imports to meet consumption requirements, largely due to changing food preferences and socioeconomic changes associated with urbanization. In addition wheat imports have been on the rise while domestic production has been declining largely due to high cost of production. With growing population, urbanization and rising prices of wheat and maize processed products, the food security situation especially for the urban poor is potentially compromised. Kenya has traditionally protected domestic wheat producers with a 25% to 35% tariff, although COMESA and EAC agreed to a process to vary these rates as circumstances require.

Prior to and in the early decades of independence, the government was heavily involved in sourcing processing and marketing of milk through KCC monopoly, which ended with liberalization in 1992 and the eventual formulation of the Kenya Dairy Development Policy to guide the dairy industry through the liberalized market environment. Despite the various national and agricultural sector specific policies in place post-liberalization, there appears to be weak government institutional mechanisms to support the dairy industry especially in areas of production costs through subsidies in inputs such as AI, feeds, research and extension support services, marketing and processing of dairy products as well as properly coordinated legal and regulatory framework. This low level of coordinated support for smallholder farmers especially in the context of liberalized regimes has seen private players benefit more. The dairy processing industry in Kenya is dominated by a few big processors and a high number

of smaller and medium operators. For decades, government policy on dairy development focused on promoting milk production with limited emphasis on processing, marketing and consumption. While the public institutions have focused on standard setting, regulation, promotion and policy, the private sector comprising formal and informal groups has focused on production, processing, marketing and input supply. The existing institutional and regulatory frameworks in the sector amount to a multiplicity of actors with multiple roles, requiring rationalization and coordination for the growth of the sector and specifically benefit the smallholder producer. The dairy sector is crucial for rural development, poverty alleviation in rural and urban areas, food and nutritional security and increased household incomes. Kenya is one of the largest producers and consumers of dairy products in Africa and the sector is largely based on smallholder production. Kenya produces enough milk for local consumption and exports some dairy products to the region and internationally as she becomes increasingly more self-sufficient in milk and milk products.

Like maize, wheat and dairy, beef has faced similar policy environment whereby processing and marketing logistics were controlled through a parastatal monopoly, KMC until liberalization in the late 1990s and post-2002 economic revitalization policies. The collapse (for 15 years) and eventual revival of KMC saw export of beef and beef products increase after 2006, time during which policy allowed private players into the beef sector. Currently commercial companies command a substantial portion of the value chain following liberalization and changing policy environment, with their products being far more prominent compared to public corporation like KMC's. The beef sector in Kenya is considered heterogeneous, independence, with a multiplicity of local terminal markets and meat traders-termed as "disorganized", diminishing their capacity for value addition and representing an important barrier to entry into high end market and export opportunities. In addition, the beef value chain suffers the problem of lack of traceability and control of animal production rendering it vulnerable to disease outbreaks. The pastoral livestock production systems in Kenya accounts for 80–90% of red meat production in relation to cattle ranches/agro-pastoral and highlands production/mixed systems. These production systems have clear distribution channels implying that shocks in a production system could cause significant disruptions in specific markets. Kenya is not self-sufficient in meat and caters for the deficit from neighbouring countries, although she is generally considered an exporter of live cattle.

The Kenyan horticultural sector has largely been private sector driven, a trait attributable to its success so far, despite having not had a policy to guide its growth and sustainability prior to the National Horticulture Policy-2012. Nevertheless like the rest of the agricultural sector, the horticulture sub-sector has operated within the prevailing national policy regime shifts discussed earlier. In Kenya, vegetables are produced mainly by smallholder farmers. The vegetable trade and value chain in Kenya faces a number of hurdles resulting in limited processing of the produce, and consequent limited value-addition which compromises their competitiveness as well as producers' incomes. However, the government has put in place policy through which programs and projects will be implemented to mitigate these hurdles.

The agricultural sector faces a number of challenges. They broadly relate to: farmer support in terms of inputs, institutions and technological capacity; improvement of land use and productivity; infrastructure; commercialization and diversification of agriculture; value addition enhancement for agricultural exports and marketing; as well as trade matters related to multiple levies, tariffs and non-tariff barriers. Agricultural produce market access and marketing infrastructure are poorly organized and inadequate and potential for value addition of dairy, beef and vegetables among others remain largely untapped. Despite the challenges, through various policy and strategy implementation, the government has

made some attempt to adopt agricultural technologies to improve productivity, empower agricultural extension officers, encourage farmers to embrace farming as a business, easing farmers' access to inputs, and funding a creating partnerships between farmers and agricultural stakeholders. Government policies to promote commercial, market-oriented and profitable agriculture to raise incomes and increase food security in Kenya are also supported through high levels of public expenditure. We observe that Kenya is moving towards policy coherence whereby agricultural sector policies have gradually adapted to the country´s general policy and political changes towards market liberalization, privatization and commercialization of the agricultural sector. This is reflected in the downward coherence and continuity between national strategies, sector policies and policies related to other supportive sectors. Through overall policy guidance and support, the government has shown commitment towards the achievement of food security, poverty reduction, employment creation and incomes.

The third objective focused on standards and labelling policies, particularly with a special focus on GMOs among others. This entailed inquiry on: International commitments such as WTO SPS and TBT Agreements; National Food Standards and the reaction of government to international private food standards such as Global Good Agricultural Practices (GAP) in terms of assistance and adaption. The study investigated whether the government promotes domestic GAPs and assessed what needs to be labelled, what does not and in particular the GMOs and the traceability of respective products.

The study found that Kenya follows global, regional and private standards in foods standards in coming up with its own national foods standards. In formulating its own national standards, priority for reference is given to relevant Codex and other international standards (e.g. SPS text or TBT text) to provide the platform on which national standards may be adopted or adapted to suit the national food safety situation. Other reference materials include regional and other national standards (of other countries), laws and regulations. Such references help harmonize national standards with other standards and technical regulations ultimately to protect consumers and promote fair trade. Kenya is also a member of the World Trade Organization (WTO) and other international organizations and must therefore adhere to the rules, regulations and standards and commitments set by these organizations. At the regional level, Kenya is also a member of the East African Community and trade among the member states is governed by the rules and regulations that are contained in the East African Community Protocol.

Standards for food and agricultural products in Kenya are developed by technical committees with their secretariats at KEBS (Kenya Bureau of Standards, 2015). Food standards give specifications for the compositional requirements, microbial requirements, the tolerance limits for contaminants, packaging, labelling and the hygiene conditions necessary for manufacture of products. Kenyan standards are derived from the Codex Alimentarius Commission – Codex, the International Organization for Standardization (ISO) and guided by the WTO Sanitary and Phytosanitary Standards (food safety issues) and Technical Barrier to Trade agreements (food quality issues).

In Kenya, the Biosafety Act of 2009 whose features include prohibition of anyone dealing with a GMO (e.g. for research, manufacture, production, commercial release and import) unless licensed by the National Biosafety Authority for contained use or intentional release into the environment and the National Biosafety Authority serves as the National focal point of all Biosafety matters in Kenya. It also exercises supervision and control over the development, transfer, handling and use of genetically modified organisms (GMOs) with a view to ensuring and assuring safety of human and animal health and provision of an adequate level of protection of the environment. The regulations in the Act cover activities involving importation into, exportation out of and movement of GMOs through Kenya.

The responsibility for ensuring food safety and quality in Kenya is divided amongst twelve regulatory ministries, departments and agencies and food safety and quality is governed by twenty Acts of Parliament implemented by the different agencies. However, the major responsibility lies with the Department of Public Health, Government Chemist, Kenya Bureau of Standards, Department of Veterinary Services and Kenya Plant Health Inspectorate Service, among others.

The study also found that in Kenya, all matters related to marking, labeling, and packaging are governed by the Food, Drugs, and Chemicals Substances Act; the Biosafety Act of 2009; the Biosafety (labeling) Regulations of 2012; the Food Labeling, Additives, and Standard Regulations; and the Weights and Measures Act and that all items traded in Kenya are supposed to be labeled with metric measurements, and packaged. It is mandatory that all foodstuffs must be labeled in English or Kiswahili and manufacturers must indicate on the labels of all consumables the date of manufacture and of expiry.

However, the study found that in Kenya food standards and regulations are hardly implemented along local and regional value chains. This is mainly due (i) to lack of awareness of consumers including all value chain operators on food safety issues and sometimes newspapers report of whole families falling sick or dying because of consuming uninspected meat. (2) Also, low income among consumers makes them base their purchase decisions on prices and not on food safety and quality. A casual check in a supermarket in up market Nairobi by the author found only one item of indicating that it was GMO free. (3) There is an also limited capacity of the national institutions responsible for controlling compliance with plant protection, animal health and food safety provisions to adapt and adopt international or regional standards and enforce national regulations and standards. (4) There is lack of awareness of food safety and quality issues and (5) Lack of incentives for value chains operators from inputs, through farming, trading and processing up to retailing to invest into good practices and quality assurance systems further to basic visual product quality attributes. (6) The informal nature of food production and the fact that they are small scale producers would find it very expensive investing in food standards it therefore means that these standards are more applicable to large scale food handlers.

The fourth objective was to analyse the intellectual property rights in the context of seeds and inputs. Kenya's seed policy was analysed and then stakeholders in seed production, distribution and marketing were mapped. The history of intellectual property rights was analysed in the context of seeds and inputs such as fertilizers and agrochemicals. Kenya's commitment and implementation of international commitments related to intellectual property such as Trade Related Intellectual Property Rights (TRIPS), international Union for the Protection of New Varieties of Plants (UPOV) 78/91 Agreements was traced and international human commitments related to seeds and input rights were discussed as well as which rights farmers have to propagate or replant seeds in Kenya. The study found that Kenya is a signatory to TRIPS and has even enacted laws on Intellectual property that give seed companies exclusive monopoly over their products and these companies are seen as pro-competitive as each seed is a new product. The laws also grant plant breeders in plant variety exclusive rights to produce reproductive material of the variety for commercial purposes.

The study found that Kenya has got a formal and informal seed systems. The formal seed system is served by government initiated research programs for some benefactor food and cash crops while the informal seed system comprises farm-saved seed, seeds purchased, multiplied or marketed locally between farmers and, seed accessed through civil society organizations, or imported by unregistered seed dealers, and relief agencies.

The study found that only registered seed traders are allowed to import seed into Kenya and that all seed imported into the country must fulfill International Seed Testing Association requirements in addition to satisfying the relevant phytosanitary measures including laboratory quality tests upon arrival.

Seed certification in Kenya is governed by the Seeds and Plant Varieties Act (Chapter 326 of the Laws of Kenya) and is guided by International Seed Testing Association (ISTA) rules of seed testing and the Organization of Economic Cooperation and Development (OECD) seed certification schemes. The certification process includes field registration, seed crop inspection during active growth, seed processing, seed laboratory testing, labeling and sealing, post control, and post certification survey.

Kenya is a signatory of the International Union for the Protection of New Varieties of Seeds (UPOV) 1978 system, and therefore the government tests, registers and protects new varieties of plants in accordance with UPOV requirements and regulations in the Seeds and Plant Varieties Act (Cap 326). This ensures protection of plant breeders' rights from unauthorized production or propagation of protected varieties, and unauthorized sale/marketing activity. The government also provides for trademark and brand name registration in Kenya. The Kenya Industrial Property Institute (KIPI) registers products via an application process. Trademarks are registered for ten years initially, but may be renewed indefinitely upon request. The Government of Kenya does not allow imports of genetically modified (GM) seeds for commercial use.

However, the study has found that The UPOV and PVP systems are exclusively aimed at supporting formal seed systems and ignore the informal farmer led seed system they also do not allow for the exchange of farm-saved seed of protected varieties through the sales of seed surpluses on the local market, restrict state procurement and the impact on rural livelihoods and biodiversity can be great especially when local food is grown from local, farmer-bred seed.

The UPOV and PVP systems usually benefit the horticultural sector hurts food crops as they do not provide a sufficient balance between the exclusive rights of breeders and the rights of farmers to save, exchange and trade protected planting material.

The plant variety protection laws that limit farmers' customary practices of accessing seed, including in emergency situations may have a negative impact on food and nutrition security, sustainability and resilience of farming and food systems. This is because laws can affect different groups of farmers in different ways, depending, for example, on their ability to have cash at the time needed, and the crops they use. It may also impact negatively on their human rights (International Covenant on Economic, Social and Cultural Rights) since plant variety protection laws can interfere to some extent with these seed systems, depending on how far they restrict the farmers' use of seed in the case of protected varieties.

6.2 Conclusions

The multilateral trading agreements and especially the AoA has not substantively increased market access for Kenya in developed countries especially to the OECD as might have been expected due to high non-tariff barriers that have been maintained by these States although it has opened up Kenya's food market to cheap subsidised food products from developed states, with detrimental impact on agricultural production by smallholder farmers who are unable to compete due to the distorted market. Declining production means declining income and opportunities of employment for the most

food insecure – smallholder farmers and farm labourers – with the effect that food poverty, general poverty and inequality has increased as a result of liberalization in trade in agricultural produce.

Kenya's food standards, like standards for other products, are enforced through the Kenya Bureau of Standards, but this is not as effectively enforced as would be expected for food for domestic consumption. On the other hand standards for agricultural production for export are enforced throughout the value chain due to dangers of loss of markets if produce standards are not met. Food and other products for export are thus of good standards and are adequately labeled due to industry enforcement more than government enforcement.

Even with the government coming up with the labeling and traceability systems, there are certain challenges in implementing traceability and labeling systems in the Kenyan context.

Some of these challenges are:

- Installing and implementing a traceability system involves costs in terms of technology and software costs, services costs, changes in processes and operating costs. For many small and medium enterprises in Kenya, these costs can be quite significant and become a huge burden to the small scale farmers and enterprises who supply the domestic market with no immediate payback.
- Most small scale farmers unlike large scale farmers in Kenya that are in the food supply chains lack the capacity and skills to provide the necessary information and training to create traceability documentation and to put in place the requisite systems and processes.
- Different requirements of different suppliers, and different documentation makes traceability complicated and time consuming efforts for small scale farmers supplying the domestic market.
- Record keeping obligations can be excessively difficult for small scale famers to comply with due to high level of illiteracy. Small scale farmers most often cannot guarantee the provision of traceability or the record keeping on the maintenance of standards which goes with it.

This therefore implies that traceability systems favor large scale producers and vertically-integrated enterprises.

UPOV has certain risks such as restricting access to seed; sub-optimal dissemination of protected variety seed; fewer coping strategies; risk of low yields; and less household income.

These negative effects could occur because new varieties of seeds and plants increase the cost of production and although the yields might be higher than that of local varieties, if the costs are higher than the benefits, and if no viable alternatives such as farmer managed seed breeding systems are available to the small scale farmers, the right to food would be negatively impacted if a country joins UPOV. It may also be that the benefits are not equally distributed even among the new variety adopting members.

Scientific advances and intellectual property rights can significantly increase crop yields, but they can also reduce crop genetic diversity, widen the gap between poor farmers and large-scale producers, and thus affect the right to food and food sustainability.

6.3 Policy Recommendations

For Kenya to be food secure, trade laws, policies and agreements must take into account the fundamental rights in the Bill of Rights. The State must thus take into account the fundamental rights of the Kenyan people in its adoption of national trade policies as well as in joining international agreements – to ensure that these policies and agreements do not negatively impact on the fundamental rights of Kenyans, especially their economic and social rights like the right to food, the right to water, human dignity and the need to provide special protection for vulnerable groups such as the food poor smallholder farmers and farm labourers. This means therefore, that even as Kenya maintains its commitment to trade liberalization, it should do so with caution taking into consideration the rights of the citizens and that is why when circumstances dictate that import tariffs should be removed to address issues of food security, the Kenya Government has not been hesitant to do this. It has also been using fertilizer subsidies to help the small scale farmers increase food production. Price subsidies on essentials such as maize flour, social protection schemes for the poor and vulnerable in the form of food subsidies, monthly stipends, 30% public procurement preference and reservation (AGPO) for women, youth and persons living with disabilities (PWDs) are all meant to make sure that even as Kenya adopts trade liberalization, the fundamental rights of citizens on the right to food are not overlooked.

In order to protect Kenyan's human rights as enshrined in the International Covenant on Economic, Social and Cultural Rights, it is important that the Kenya government comes up with ways and means of making sure that the Kenyan farmer does not suffer in the process of implementing the recommendations of the UPOV 1991. This requires using an integrated seed sector development such that the rights of the farmer as well as the right of the plant breeder are protected. That is combing both formal and informal seed and plant breeding.

The intellectual property regimes on seed and plant breeding should be managed in accordance with common responsibility to prevent the unacceptable prioritization of profit for some over benefit for all implying that there should be policy intervention to ensure that marginalized groups have unrestricted access to information and the benefits of seed and plant breeding varieties produced by applying scientific methods. They also have a right to participate in decision making regarding the scientific methods used in seed and plant breeding in order to avoid introduction of culturally unacceptable products in the seeds or seeds that may contain substances that may be injurious to the health of the citizens as has been alleged in GMO products.

The Kenya government should allow traditional practices of small scale farmers to access protected seed varieties through farmer managed seed systems by ensuring access of protected seed and plant varieties by offering subsidies to small scale poor farmers so that they can buy these varieties at prices that are affordable to them.

The Kenya Government should also invest heavily in publicly funded breeding initiatives for the benefit of small-scale farmers or certain groups of farmers such as women who are not sufficiently reached by existing private breeding programs. Public breeding programs can team up with international agricultural centers, NGOs, and so on in order to promote transparency and participatory decision making at all stages of the seed and plant breeding program.

These initiatives would entail using an Integrated Seed Sector Development (ISSD) approach. An Integrated Seed Sector Development approach takes cognizance of the fact that formal seed systems in seed sector development programs expect informal seed systems to gradually evolve into formal and commercial systems. It also emphasizes the plurality of seed systems that exist in a particular

country or region, recognizing that farmers typically gain access to seed from different seed systems. The Integrated Seed Sector Development aims to support all the different seed systems since all have their own benefits and limitations and require a unique approach in strengthening. An Integrated Seed Sector Development approach aims to foster pluralism and guide seed policies and programs in their design to strengthen multiple seed systems. In an ISSD framework, differentiation between rights and limitations for different categories of farmers and crops could be introduced. This will ensure that a blanket implementation of plant breeders' rights does not negatively impact on smallholder farmers, and a pluralistic approach to seed sector development Kenya also should be flexible with its seed regulations. For example, locally propagated seed material especially for root and tuber crops are usually in short supply in Kenya mainly because it is expensive to transport. So the Kenya government should allow KEPHIS supported county level oversight for these crops instead of forcing adherence to national seed certification might be a better way to go.

Regarding the right to benefit from scientific progress and its applications is important that countries that join UPOV must ensure that scientific breeding progress is accessible to small-scale farmers, particularly vulnerable groups; that the scientific progress reaches the vulnerable groups in practice and ensure that the process of implementation for UPOV Plant Variety Protection laws complies with human rights standards and principles, especially with regard to participation in decision-making.

This can be done by allowing traditional practices of small scale farmers to access protected seed varieties through farmer managed seed systems. Governments can also ensure access of protected seed and plant varieties by offering subsidies to small scale poor farmers so that they can buy these varieties at prices that are affordable to them.

7 References

1. *A Dictionary of Food and Nutrition 2005*, originally published by Oxford University Press 2005, http://www.encyclopedia.com/education/dictionaries-thesauruses-pictures-and-press-releases/food-standard
2. Aklilu, Y. (2002) "An Audit of the Livestock Marketing Status in Kenya, Ethiopia and Sudan", Volume 2 - *Issues and Proposed Measures. Organization of African Unity/ Interafrican Bureau for Animal Resources*. http://www.eldis.org/fulltext/cape_new/Akliliu_Marketing_vol_1.pdf
3. Alarcon, P., Fèvre, E. M., Murungi, M. K., Muinde, P., Akoko, J., Dominguez-Salas, P., Kiambi, S., Ahmed, S., Häsler, B., and Rushton, J. (2017) "Mapping of Beef, Sheep and Goat food systems in Nairobi — A Framework for Policy Making and the Identification of Structural Vulnerabilities and Deficiencies", *Agricultural Systems, 152*:1–17.
4. Alila, P. O. and Atieno, R. (2006a) *Agricultural Policy in Kenya, Future Agricultures*, Policy Brief 006, January 2006, http://www.future-agricultures.org
5. Alila, P. O. and Atieno, R. (2006b) *Agriculture Policy Processes in Kenya*, Future Agricultures, Policy Brief 007, January 2006, http://www.future-agricultures.org
6. Atieno, R. and Kanyinga, K. (2008) *The Politics of Policy Reforms in Kenya's Dairy Sector Future Agricultures*, Policy Brief 019, February 2008, http://www.future-agricultures.org
7. Banerjee, R. and Menon, H. (2015) *Traceability in Food and Agricultural Products: Trade Impact for Good*, International Trade Centre Bulletin No. 91, 2015.
8. Bergevoet, R. and Van Engelen, A. (2014) *The Kenyan Meat Sector Opportunities for Dutch Agribusiness*, LEI Wageningen UR.
9. Bingi, S. and Tondel, F. (2015) *Recent Developments in the Dairy Sector in Eastern Africa: Towards a Regional Policy Framework for Value Chain Development*, ECDPM Briefing Note No. 78 – September 2015, European center for Development Policy Management, Maastricht, The Netherlands.
10. BMZ Federal Ministry for Economic Cooperation and Development (2012), *Harmonization and Mutual Recognition of Regulations and Standards for Food Safety and Quality in Regional Economic Communities: The case of the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA)*, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
11. Brooks, J. (2014) Policy coherence and food security: The effects of OECD countries' agricultural policies, Food Policy, 44:88-94. https://doi.org/10.1016/j.foodpol.2013.10.006
12. Business Daily (2017) *Remove Barriers to Spur Private Sector Investment*, APRIL 12, 2017.
13. Carey, C. (2008) E051 *Governmental Use of Voluntary Standards Case Study 6: Kenya and the KenyaGAP Standard for Good Agricultural Practice*, ISEAL Alliance.
14. Chemonics International Inc. (2010) *Staple Foods Value Chain Analysis: Country Report – Kenya,* Prepared for USAID by Chemonics International Inc.
15. Codex Alimentarius Commission (CAC)*.* 2006*. Principles for Traceability/product Tracing as a Tool within a Food Inspection and Certification System*,
16. http://www.codexalimentarius.net/input/download/standards/10603/CXG_060e.pdf *(Visited 11th April 2017)*
17. Common Market for Eastern and Southern Africa (2015) *Sanitary and Phytosanitary Logical Framework*, Official Gazette, Vol. 20, No.1
18. *programmes.comesa.int/.../article/.../COMESA%20SPS%20Logical%20Framework.do... (Visited 1st May 2017)*
19. Christinck, A. and Tvedt, M. (2015) *The UPOV Convention, Farmers' Rights and Human Rights: An Integrated Assessment of Potentially Conflicting Legal Frameworks*, Deutsche Gesellschaft fürInternationale Zusammenarbeit (GIZ) GmbH, Bonn and Eschborn, Germany.
20. D'Alessandro, S. P., Caballero, J., Lichte J., and Simpkin, S. (2015) "KENYA: Agricultural Sector Risk Assessment" *Agriculture Global Practice Technical Assistance Paper*, World Bank Group Report Number 97887, November 2015.
21. Daily Nation (2016) *Large Scale Maize Millers in Kenya Rejects Maize Sourced from NCPB, Claims it is Unfit for Human Consumption*. http://www.nation.co.ke/, June 30 2016. Accessed at, http://www.farmerstrend.co.ke/large-scale-maize-millers-kenya-rejects-maize-sourced-ncpb-claims-unfit-human-consumption/, *Visited on 18th April, 2017*.
22. Daly, J., Abdulsamad, A. and Gereffi, G. (2016) *Regional Value Chains in East Africa: Summary Report*, Center on Globalization, Governance and Competitiveness, Duke, October 2016
23. De Jonge, B. (2014) "Plant Variety Protection in Sub-Saharan Africa: Balancing Commercial and Smallholder Farmers' Interests", *Journal of Politics and Law,* Vol. 7 No. 7. http://dx.doi.org/10.5539/jpl.v7n3p100
24. East African Community (2007) *Treaty for the Establishment of the East African Community*, http://eacj.org/wp-content/uploads/2012/08/EACJ-Treaty.pdf
25. FAO/WHO (2005) *Practical Actions to Promote Food Safety*: Regional Conference on Food Safety for Africa, Final Report. Harare, Zimbabwe. 3 – 6 October 2005.
26. Farmer, E., and Mbwika, J. (2012) *End Market Analysis of Kenyan Livestock and Meat: A Desk Study*, microREPORT #184, USAID.
27. Food and Agriculture Organization of the United Nations (2004) "Seed Multiplication by Resource Limited farmers", *[FAO] Plant Production and Protection Paper*, No. 180, FAO, Rome, Italy

28. FoodWorld Media (2017) *The Dairy Industry in Kenya*, http://www.foodbusinessafrica.com/index.php/magazine/company-features-industry-reports/512-the-dairy-industry-in-kenya, accessed on 31/5/17.
29. Germain, C. (2003), *Traceability Implementation in Developing Countries: it's Possibilities and its Constraints: a Few Case Studies.* http://ftp.fao.org/es/esn/food/traceability.pdf. *(Visited 11th April 2017)*
30. Gitau, R, Kimenju, S, Kibaara, B, Nyoro, J, Bruntrup, M. and Zimmerman, R. (2008) *Agricultural Policy-Making in Sub Saharan Africa: Kenya's Past Policies, Tegemeo Institute of Agricultural Policy and Development*, Nairobi, Kenya www.tegemeo.org/viewdocument.asp?ID=188
31. Global Agricultural Information Network (2005) *Kenya, Food and Agricultural Import Regulations and Standards* United States Department of Agriculture (USDA) Foreign Agricultural Service, GAIN Report No. KE 5011, November 2005.
32. Global Agricultural Information Network (2011) *Kenya Wheat Report*, Global Agricultural Information Network (GAIN) Report.
33. Handbook for Introduction of Food Traceability Systems: Guidelines for Food Traceability, Revision Committee on the Handbook for Introduction of Food Traceability Systems, March 2003 (First edition); March 2007 (Second edition); Food Marketing Research and Information Centre (FMRIC) 2008
34. Hill, C. (1993) "Trade Policy and Promotion of Manufactured Exports", In Lindauer, D. L and M. Roemer (Eds.), *Asia and Africa: Legacies and Opportunities in Development International Centre for Economic Growth*, Cambridge
35. Howard, P. H. (2015) "Intellectual Property and Consolidation in the Seed Industry", *Crop Sci*. Vol. 55: pp. 1–7 (2015). doi: 10.2135/cropsci2014.09.0669,
36. http://www.apbrebes.org/files/seeds/files/Howard_seed_industry_patents_concentration_2015.pdf (visited 21st April, 2017)
37. Howe, K. F. (2011) "Wisdom in the Earth: an Examination of the History of Intellectual Property Rights in Plants and Seeds", *Graduate Theses and Dissertations.* Paper 10338 Iowa State University Repository,
38. http://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1355andcontext=etd (visited 21st April, 2017)
39. Ikiara, G. K. Nyunya, J. O. and Odhiambo, W. (2004) "Kenya: Formulation and Implementation of Strategic Trade and Industrial Policies: The Politics of Trade and Industrial Policy in Africa". Ed. Charles Soludo, Osita Ogbu and Ha-Joon Chang, New Jersey: *African World Press Inc.*, pp. 211.
40. International Organization for Standards (2007) *Traceability in the Feed and Food Chain-General principles and basic requirements for system design and implementation*, https://www.iso.org/standard/36297.html
41. Jayne, T. S., Myers, R. J., and Nyoro, J. (2005) *Effects of Government Maize Marketing and Trade Policies on Maize Market Prices in Kenya.* Tegemeo Working Paper 15/2005, Tegemeo Institute of Agricultural Policy and Development, February 11, 2005.
42. Kariuki, J. (2015) Food Security and Crop Seed in Kenya: Challenging Trends We Cannot Afford to Ignore, Published November 2015, https://www.stak.or.ke/wp-content/uploads/2016/09/Food-Security-Crop-Seed-in-Kenya-Challenging-Trends-We-Cannot-Afford-to-Ignore-Dr.-Joseph-Kariuki.pdf
43. Kariuki, J. and Templar, N. A. (2016) *Food Security and Crop Seed in Kenya: Big Pay Offs that We Cannot Afford to Ignore*, Published August 2016, https://www.stak.or.ke/wp-content/uploads/2016/09/Food-Security-Crop-Seed-in-Kenya-Challenging-Trends-We-Cannot-Afford-to-Ignore-Dr.-Joseph-Kariuki.pdf
44. Kenya Bureau of Standards (2015) https://www.kebs.org/ (Visited on 11th April 2017)
45. Kenya Bureau of Standards (2016) Frequently asked Questions https://www.kebs.org/.../download.php?...Kebs%20Booklet%20April%205%202016
46. Kenya Law Report (2012) "National Biosafety (Labelling) Regulations, 2012", *kenyalaw.org/.../kenyalex/Kenya/Legislation/.../Acts%20and%20Regulations/.../Biosaf...* http://www.kenyalaw.org/lex/actview.xql?actid=Const2010
47. Kenya Market Trust (2014) Kenya Livestock and Meat Market Analysis: For Cattle, Sheep and Goat. *Kenya market trust and I-Dev international http://www.kenyamarkets.org/current-sectors/livestock/*
48. Kirago, R. K. (2015) Global Good Agricultural Practices Adoption and Competitive Advantage by Kenya Fruit Exporters, http://erepository.uonbi.ac.ke/bitstream/handle/11295/94552/Kirago_Global%20good%20agricultural%20practices.pdf?sequence=1andisAllowed=y
49. KMC (2017) Kenya Meat Commission-About. http://www.kenyameat.co.ke/index.php?option=com_contentandview=articleandid=47andItemid=75, accessed on 25/4/17.
50. KNBS (2015) *Economic Survey*-2015, Kenya National Bureau of Statistics, Government Printers, Nairobi, Kenya.
51. KNBS (2017) *Economic Survey*-2017, Kenya National Bureau of Statistics, Government Printers, Nairobi, Kenya.
52. KNBS (Various) *Economic Surveys*, Kenya National Bureau of Statistics, Government Printers, Nairobi, Kenya.
53. La Via Campesina and GRAIN (2015) Seed Laws that Criminalize Farmers: Resistance and Fight Back, www.viacampesina.org and tv.viacampesina.org and www.grain.org
54. Laws of Kenya (2010) *Constitution of Kenya, 2010,* http://www.kenyalaw.org/lex/actview.xql?actid=Const2010
55. Louwaars, N. P., de Boef, W. S., and Edeme, J. (2013) "Integrated Seed Sector Development in Africa: A Basis for Seed Policy and Law", *Journal of Crop Improvement, Vol. 27, No.*2, pp. 186-214. http://dx.doi.org/10.1080/15427528.2012.751472
56. Macauley, H. (2015) *Cereal Crops*, Background paper for Feeding Africa Conference 21-25 October 2015, UNECA, AfBD, AU.
57. MAFAP (2013) *Review of Food and Agricultural Policies in Kenya*, MAFAP Country Report Series, FAO, Rome, Italy
58. Meilink, H. A. (1982) "The Effects of Import-substitution: The Case of Kenya's Manufacturing Sector", *Discussion Paper* Number 276: Institute of Development Studies, University of Nairobi.
59. Monroy, L., Mulinge, W. and Witwer, M. (2013) "Analysis of Incentives and Disincentives for Wheat in Kenya", *Technical notes series*, MAFAP, FAO, Rome, Italy.

60. Montenegro, M. (2015) *How Seed Laws Make Farmers' Seeds Illegal: A new report examines how farmers' basic right to replant is under renewed threat from corporations and governments*, http://www.alternet.org/environment/how-seed-laws-make-farmers-seeds-illegal
61. Munyi, P. and Jonge, B. (2015) "Seed Systems Support in Kenya: Consideration for an Integrated Seed Sector Development Approach", *Journal of Sustainable Development*; Vol. 8, No. 2. www.ccsenet.org/jsd
62. Nation Media (2017) "What Will end Hunger, Put Money in Farmers' Pockets", *Saturday Nation*, April 29 2017, Nairobi, Kenya.
63. National Biosafety Authority (2009), Biosafety Act 2009, http://www.biosafetykenya.go.ke/index.php?option=com_contentandview=articleandid=16andItemid=121 (Visited 2nd May 2017).
64. Nyoro, J. K., Ayieko, M., and Muyanga, M. (2007) "The Compatibility of Trade Policy with Domestic Policy Interventions Affecting the Grains Sector in Kenya", Tegemeo Institute, Egerton University. Paper presented at the FAO's workshop on *Trade and Policy for Food Products Conducive to Development in Eastern Africa*, 1-2 March 2007, Rome, Italy.
65. Nyoro, J. K., Kiiru, M. W., and Jayne, T. S. (1999) "Evolution of Kenya's Maize Marketing systems in the Post Liberalization Era", Tegemeo Agricultural Monitoring and Policy Analysis (TAMPA) Project Paper, http://www.aec.msu.edu/agecon/fs2/kenya/index.htm
66. Oloo, J. (2010) *Food Safety and Quality Management in Kenya: An Overview of the Roles played by Various Stakeholders*, https://www.ajol.info/index.php/ajfand/article/view/64283/52077 (Visited on 11th April 2017)
67. Opati, L. M. (2009) "Intellectual Property Rights in Health-Impact on Access to Drugs", in Wekesa, M. and **Sihanya**, B. (eds), *Intellectual Property Rights in Kenya*, Konrad Adenauer Stiftung, Nairobi.
68. Poulton, C. and Kanyinga, K. (2014) "The Politics of Revitalizing Agriculture in Kenya", *Development Policy Review,* Vol. 32, s151-s172 http://dx.doi.org/10.1111/dpr.12080
69. Prášková, D. M. (2013) **"**Food Security and Agricultural Trade in Kenya: The Impact of the Economic Partnership Agreement (EPA) on Food Security of Poor Kenyans", *Prague Global Policy Institute* –February 2013.
70. Rademaker, I. F., Koech. R. K., Jansen, A., and Van der Lee, J. (2015) *Smallholder Dairy Value Chain Interventions: The Kenya Market-led Dairy Programme (KMDP) – Status Report.* Wageningen UR (University and Research) Centre for Development Innovation: Report CDI-16-018. Wageningen.
71. Republic of Kenya (1965) *African Socialism and its Application to Planning in Kenya*, Nairobi: Government Press.
72. Republic of Kenya (1986), *Sessional Paper no. 1 of 1986 on Economic Management for Renewed Growth*, Nairobi: Government Press.
73. Republic of Kenya (2009) *National Trade Policy, Ministry of Trade*, Nairobi: Government Printers
74. Republic of Kenya (2015) *National Trade Policy: Transforming Kenya to a Competitive Export Led and Efficient Domestic Economy*, Final Draft, 10th December 2015
75. Republic of Kenya (2010) *National Seed Policy,* Ministry of Agriculture, Kilimo House, Nairobi: Government of the Republic of Kenya, 2010.
76. Republic of Kenya (2011) *National Food and Nutrition Security Policy*, Agricultural Sector Coordination Unit (ASCU), website: www.ascu.go.ke, (Visited on 11th April 2017)
77. Republic of Kenya (2013) *Kenya Gazzette* Supplement No 28, The Crops Act 2013, No. 16
78. Republic of Kenya (2003) *Kenya: Economic Recovery Strategy for Wealth and Employment Creation 2003 – 2007*, Ministry of Planning and National Development, Government Printers, Nairobi, Kenya.
79. Republic of Kenya (2004) *Strategy for Revitalizing Agriculture 2004-2014*, Ministry of Agriculture and Ministry of Livestock and Fisheries Development, Nairobi.
80. Republic of Kenya (2007) *Kenya Vision 2030: A Competitive and Prosperous Kenya*, Government Printer, Nairobi, Kenya.
81. Republic of Kenya (2009) *Agricultural Sector Development Strategy (ASDS):2009 – 2020*, Government of Kenya 2009, Government Printers, Nairobi, Kenya.
82. Republic of Kenya (2012) National Horticulture Policy: Government Printers, Nairobi, Kenya.
83. Republic of Kenya (Various) *Statistical Abstracts*, Government Printers, Nairobi, Kenya.
84. Republic of Kenya (2013) *Sessional Paper No. 5 of 2013 on the National Dairy Development Policy: Towards a Competitive and Sustainable Dairy Industry for Economic Growth in the 21st Century and Beyond,* Ministry of Agriculture, Livestock and Fisheries, November 2013. Government Printers, Nairobi, Kenya
85. Republic of Kenya (2015a) *Ministry of Agriculture, Livestock and Fisheries - Strategic Plan 2013 - 2017 (Revised 2015),* Government Printers, Nairobi, Kenya
86. Republic of Kenya (2015b) *Economic Review of Agriculture [ERA] 2015*, Ministry of Agriculture, Livestock and Fisheries, Government Printers, Nairobi, Kenya
87. Republic of Kenya (2015c) *National Trade Policy*: *"Transforming Kenya to a competitive Export Led and Efficient domestic Economy',* Government Printers, Nairobi, Kenya.
88. Republic of Kenya (2016) *About Horticultural Crops Directorate* Agriculture and Food Authority (AFA), http://www.agricultureauthority.go.ke/index.php/horticultural-crops-development-authority/accessed on 19/4/17.
89. Republic of Kenya (2017) *National Trade Policy: Transforming Kenya into a Competitive Export-Led and Efficient Domestic Economy*, Nairobi: Ministry of Industry, Trade and Cooperatives, Department of Trade.
90. Ronge, E. E., and Nyangito, H. O. (2000) "A Review of Kenya's Current Industrialization Policy", *Kenya Institute for Public Policy Research and Analysis, KIPPRA Discussion Paper No.3*.
91. RSA (2015) "Report of a Study on Fresh Vegetables Market in Kenya: Desk Review", *Research Solutions Africa* (RSA) Ltd.

92. Sachs, J. and Warner, A. (1995) "Economic Reform and the Process of Global Integration" *Brookings Papers on Economic Activity*, Vol. 1, pp.1-118
93. Sikinyi, E. O. (2010) "Kenya Seed Sector Baseline Study", *Survey Report on the Seed Sector in Kenya* Submitted to COMESA and European Union
94. Snipes, K. and Kamau, C, (2012) "Kenya Bans Genetically Modified Food Imports", *Global Agricultural Information Network* Report, United States Department of Agriculture.
95. SOURCEWATCH (2012) *Dairy Development Projects in Kenya,* http://www.sourcewatch.org/index.php/Dairy_Development_Projects_in_Kenya. Accessed on 31/5/17.
96. Swamy, G. (1994), "Kenya: Patchy, Intermittent Commitment." In Ishrat Husain and Rashid Faruquee, eds., *Adjustment in Africa: Lessons from Country Case Studies.* Washington, DC: Oxford University Press for World Bank.
97. The Berne Declaration (2014) *Owning Seeds, Accessing Food: A Human Rights Impact Assessment of UPOV 1991*. The Berne Declaration, Zurich, Switzerland.
98. The Cartagena Protocol on Biosafety (2003) https://bch.cbd.int/protocol/
99. UNESCO (2009) *The Right to Enjoy the Benefits of Scientific Progress and its Applications*. Venice, Italy, 16–17 July 2009. http://unesdoc.unesco.org/images/0018/001855/185558e.pdf
100. United Nations (1993) *The Vienna Declaration and Program of Action*, adopted by the World Conference on Human Rights in Vienna on 25 June 1993 (A/ CONF.157/23). United Nations New York, USA.
101. United Nations (2008) *Optional Protocol to the International Covenant on Economic, Social and Cultural Rights* (A/RES/63/117). United Nations, New York, USA.
102. United Nations Conference on Trade and Development (2005) *Training Module on the WTO Agreement on Sanitary and Phytosanitary Measures*, United Nations New York and Geneva, November 2005
103. Wekesa, M. (2009) "An Overview Of The Intellectual Property Rights (IPRS) Regime In Kenya", in Wekesa and Shihanya (eds), *Intellectual Property Rights in Kenya*, pp.1-11, Konrad Adenauer Stiftung, Nairobi
104. Wekesa, M. and **Sihanya**, B. (2009) *Intellectual Property Rights in Kenya*, Konrad Adenauer Stiftung, Nairobi
105. Were, M. Alemayehu, G. Ndung'u, N. S and Karingi, S. N. (2002) "Analysis of Kenya's Export Performance: An Empirical Evaluation", KIPPRA Discussion Paper Series, Discussion Paper No. 22, Nairobi: *The Kenya Institute for Public Policy Research and Analysis*.
106. Were, M. Ngugi, R. W. and Makau, P. (2006) "Understanding Reform Process in Kenya", in Mensah, J. (eds), *Understanding Economic Reforms in Africa: A Tale of Seven Nations*, Hampshire: Palgrave Macmillan.
107. WIPO (2013) *Customary Law, Traditional Knowledge and Intellectual Property: An Outline of the Issues.* WIPO, Geneva: Switzerland.
108. World Bank (2005) *The Role of Standards under Kenya's Export Strategy Contribution to the Kenya Diagnostic Trade and Integration Study*, World Bank, March 2005.
109. World Food Program (2016), "Comprehensive Food Security and Vulnerability Survey: Summary Report, Kenya 2016", *VAM Food Security Analysis* www.wfp.org
110. World Health Organization and Food and Agricultural Organization (2010) *Codex Alimentarius Commission Procedural Manual*, Nineteenth edition, Joint FAO/WHO Food Standards Program, FAO, Rome
111. World Intellectual Property Organization (nd) *What is Intellectual Property*? World Intellectual Property Organization, Publication No. 450(E) Geneva.
112. World Trade Organization (1995), *Technical Barriers to Trade Agreement*, https://www.wto.org/english/docs_e/legal_e/17-tbt_e.htm
113. WTO (1995) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement): Texts of the Agreement, https://www.wto.org/english/tratop_e/sps_e/spsagr_e.htm

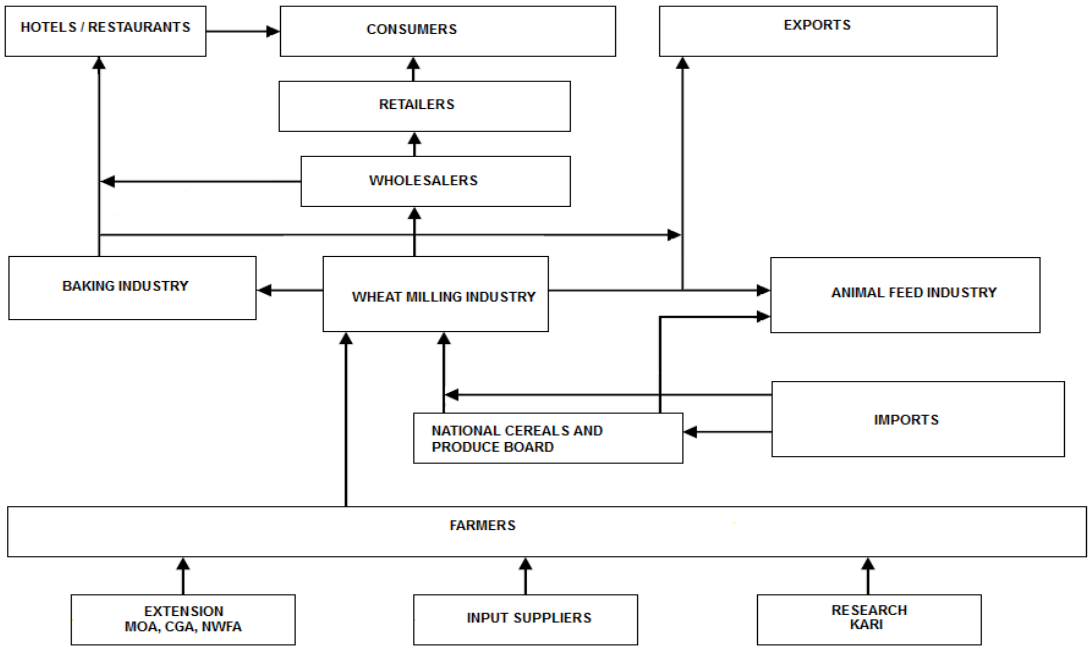
8 Appendices

APPENDIX A1: Selected Projects and Programs Focusing on Agricultural and Economic Development

Department	S/No.	Name of Project/ Program	Scope	Objective	Period and Status
State Department of Agriculture	1	Agricultural Sector Development Support Programme (ASDSP)	National-47 Counties	To increase equitable income, employment and improve food security of male and female target groups through improved production and productivity in the rural smallholder farm and off farm sectors	2012 to 2017 ongoing and on schedule
	2	Kenya Agricultural Productivity Project and Agribusiness Project (KAPAP)	20 Counties	To increase agricultural productivity and incomes of Participating smallholder farmers	2008 to 2015 ongoing and on schedule
	3	Kenya Agricultural Productivity and Sustainable Land Management Project (KAPSLM)	9 Counties	To facilitate agricultural producers and other natural resource users to adopt environmentally-sound land management practices without reducing their incomes	2010 to 2015 ongoing and on schedule
	4	National Accelerated Agricultural Inputs Access Project (NAAIAP)	41 Counties	To improve inputs (seed and fertilizers) access and affordability for targeted 1.8 million resource poor farmers.	Started in 2007 implemented every FY ongoing and on schedule
	5	Eastern Africa Agricultural Productivity Project (EAAPP)	24 Counties	To increase agricultural productivity and competitiveness of agriculture sector, increase farm incomes, reduce poverty and improve food security in Eastern Africa	2009 to 2015. ongoing and on schedule
	6	Small-scale Horticulture Development Project (SHDP)	8 Counties-9 Irrigation Schemes	To contribute to poverty reduction and enhance food security.	2008 to 2015. ongoing and on schedule
	7	Smallholder Horticulture Empowerment and Promotion Unit Project (SHEP UP)	33 Counties	To improve the livelihood of smallholder horticulture farmers	2010 to 2015
	8	Smallholder Horticulture Empowerment Promotion Project for Local and Up scaling (SHEP PLUS)	18 Counties	To increase number of horticulture smallholders applying the SHEP Approach and improve their livelihood	2015 to 2020 design and planning for next phase complete
	9	Smallholder Horticulture Marketing Programme (SHoMAP)	7 Counties	To increase domestic horticulture productivity and improve the produce and input marketing system.	2007 to 2015 completed in December 2014 and ending in June 2015

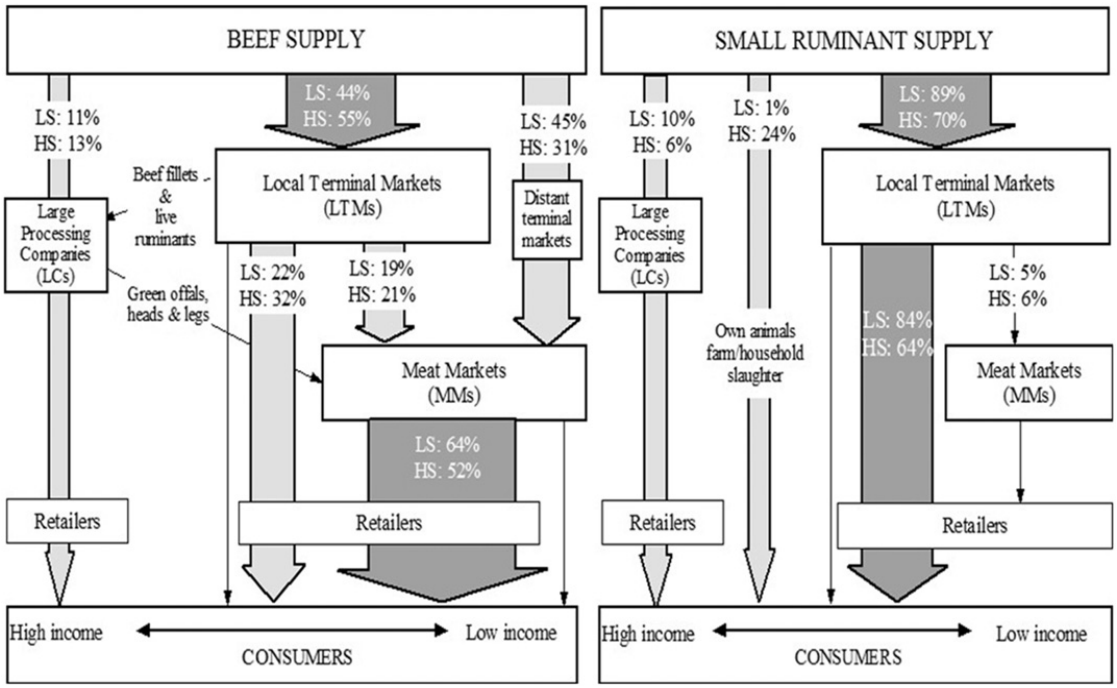
Department	S/No.	Name of Project/ Program	Scope	Objective	Period and Status
	10	Youth in Modern Agriculture Project (YMAP)	5 Counties	To increase youth participation in horticultural production, agribusiness and agro-processing	Started in the FY 2012/ 2013 and is implemented every FY ongoing and on schedule
	11	Kenya Cereal Enhancement Project and Kenya Climate Resilient Agricultural Livelihoods Project- KCEP -CRAL	15 Counties	To contribute to the reduction of rural poverty and food insecurity of smallholder farmers in the ASALs by support to tap into the economic potential of targeted value chains	2015 to 2021.on schedule negotiations ongoing
	12	Strengthening Fertilizer Quality and Regulatory Standards in Kenya	National-47 Counties	To contribute to food security through enhanced fertilizer quality and regulatory standards	2015 to 2017. On schedule
State Department of Livestock	1	Smallholder Dairy Commercialization Project	9 Counties (Nakuru, Bomet, Nandi, Uasin-Gishu, Transzoia, Bungoma, Nyamira, Kisii)	To increase the incomes of poor rural households that depend substantially on production and trade in dairy products for their livelihoods.	2006 – 15 On-going
	2	Regional Pastoral Livelihoods Resilience Project	All ASAL Counties	To enhance drought resilience of pastoralists and agro-pastoralists in drought prone areas.	2014-2009 (On-going)
	3	Mainstreaming Sustainable Land Management in Agro-pastoral Production Systems of Kenya (SLM)	4 Counties; Embu Garissa Kitui NaRepublic of Kenya	To provide a basis for economic development, food security and sustainable livelihoods while restoring ecological integrity	2010-2015
	4	Establishment of Coast Disease Free Zone	Counties of Kwale, Mombasa, Kilifi, Taita-Taveta, Tana River and Lamu.	To increase market access for animal and animal products	On-going

APPENDIX A2: The Wheat Value Chains in Kenya



Source: Monroy et al., 2013, pp 9

APPENDIX A3: Flow and Contribution of Each Food Segment in the Supply of Beef and Small Ruminant Meat in Nairobi



[The numbers in arrows indicate the percentage of all beef or small ruminant meat flows into the city for the low season (LS) and the high season (HS).]. Source: Alarcon et al., 2017, pp:5

This study investigates the prevailing trade conditions in Kenya in order to understand the extent to which the current food systems have been shaped by Kenya's trade policy and the extent to which Kenya's trade policy is embedded in or restricted by international commitments. The study also analyzes Kenya's agricultural policy in order to understand the extent to which the Government of Kenya is involved in the food processing industry. Finally, the study examines Kenya's food standards and labeling policy and sheds light on intellectual property rights with regards to seeds and other inputs in Kenya.

The present Working Paper Series is an outcome of the project "Towards Food Sustainability: Reshaping the Coexistence of Different Food Systems in South America and Africa". The project is part of the Swiss Programme for Research on Global Issues for Development (r4d Programme) funded by the Swiss Agency for Development and Cooperation and the Swiss National Science Foundation and is carried out by the following institutions: Comunidad Pluricultural Andino-Amazonica para la Sustentabilidad (COMPAS), Cochabamba, Bolivia; Centre for Training and Integrated Research in Arid and Semiarid Lands Development (CETRAD), Nanyuki, Kenya; Geneva Academy of International Humanitarian Law and Human Rights, Geneva, Switzerland; as well as Centre for Development and Environment (CDE), Institute of Geography, and Institute of Social Anthropology, all at the University of Bern, Switzerland.

COMPAS Comunidad Pluricultural Andino-Amazónica para la Sustentabilidad

CETRAD Centre for Training and Integrated Research in ASAL Development

Geneva Academy of International Humanitarian Law and Human Rights | Académie de droit international humanitaire et de droits humains à Genève | Geneva Academy

UNIVERSITÄT BERN