Standards and Development:
Perspectives from Kenya's Horticultural Export Industry

Gloria Atieno Otieno

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NORMEN EN ONTWIKKELING:
PERSPECTIEVEN VANUIT DE TUINBOUWEXPORT IN KENIA

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Gloria Atieno Otieno
born in Kakamega, Kenya

Doctoral Committee

Promotores
Prof.dr. S.M. Murshed
Prof.dr. P. Knorringa

Other members
Prof.dr. N.P. Perdikis, Aberystwyth University
Associate professor dr. A de Vaal, Radboud University
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To
My children Joy and Simba
May you be inspired

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Acronyms

ACP	African Caribbean & Pacific
ADB	African Development Bank
ADF	Augmented Dickey Fuller
AERC	African Economic Research Consortium
ALOP	Appropriate Level of Protection
ASMEP	Assistance to Small &Micro Enterprises
AFRICERT	African Certification Company
ARDL	Auto regressive Distributed Lag
BRC	British Retail Consortium
BSE	Bovine Spongiform Encephalopathy
CIF	Cost Insurance & Freight
CPI	Consumer Price Index
CSR	Corporate Social Responsibility
DANIDA	Danish International Development Assistance
DFID	Department for International Development
EC	European Commission
ECT	Error Correction Term
EDF	European Development Fund
EPA	Economic Partnership Agreements
EPC	Export promotion Council
EPZ	Export Processing Zones
EU	European Union
EUREPGAP	European Union Good Agricultural Practices
ETI	Ethical Trading Initiative
FDI	Foreign Direct Investment
FFV	Fresh Fruits and Vegetables
FPEAK	Fresh Produce Exporters Association of Kenya

FGD	Focus Group Discussions
GLOBALGAP	Global Good Agricultural Practices
GDP	Gross Domestic Product
GTZ	German Technical Cooperation
GVC	Global Value Chain
HCDA	Horticultural Crops Development Authority
HVC	High Value Chain
IDS	Institute for Development Studies
IFAD	International Fund for Agricultural Development
ISO	International Standardization Organization
JICA	Japanese International Cooperation Agency
KAM	Kenya Association of Manufacturers
KEBS	Kenya Bureau of Standards
KEPHIS	Kenyan Plant Inspectorate Services
KFC	Kenya Flower Council
KHE	Kenya Horticultural Exporters
KNBS	Kenya National Bureau of Standards
KNCCI	Kenya National Chamber of Commerce and Industry
MESPT	Micro-Enterprise Support Program
MNC	Multinational Corporations
MRL	Maximum Residue Limits
NEP	National Enquiry Point
NIE	New Institutional Economics
NTB	Non-Technical Barriers to Trade
NTM	Non-Tariff Measures
NGO	Non-Governmental Organization
PO	Producer organization
PPP	Public Private Partnerships
PPML	Poisson Pseudo Maximum Likelihood
QCD	Quality Cost Delivery
QMS	Quality Management Systems
RASFF	Rapid Alert System for Food and Feed
REER	Real Effective Exchange Rates
ROI	Return on Investments

SACCO	Savings and Credit Cooperative
SAPs	Structural Adjustment Programs
SIDA	Swedish International Development Agency
SITC	Standard International Trade Classification
SGS	Societe General de Surveillance
SMEP	Small and Micro-Enterprises
SPS	Sanitary and Phyto-Sanitary Measures
SQAM	Systems Quality Accreditation Metrology
TBT	Technical barriers to Trade
TCE	Transaction Cost Economics
UK	United Kingdom
UNCTAD	United Nations Conference on Trade & Development
USAID	United States Agency for International Development
VAR	Vector Auto Regression
VECM	Vector Error Correction Model
WDR	World Development Report
WTO	World Trade Organization

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STANDARDS AND DEVELOPMENT: PERSPECTIVES FROM KENYA'S HORTICULTURAL EXPORT INDUSTRY - GLORIA OTIENO

Abstract

This thesis examines perspectives on standards and development in Kenya's horticulture sector. The debate on standards and development is at the forefront of global policy discussions. The proliferation of trade standards is often seen as a threat to poor countries that will diminish their export opportunities and lead to an unequal distribution of the gains from trade and result in marginalization of poor farmers. However, empirical studies have produced diverse conclusions about the effects of standards on development. The ability to comply with international standards has emerged as a key factor of success in developing countries' participation in international trade. Kenya's horticulture sector continues to play a major role in development as it directly provides export income to numerous small and large scale producers, provides labour and is the second largest forex exchange earner for the country. The success of this sector largely depends on the ability of key stakeholders to meet market requirements. The thrust of this thesis is to present the different perspectives of standards and development in Kenya's horticulture sector using case studies that provide linkages and insights into this debate. These different aspects of analysis generate different

dimensions of the link between standards and development. In this research, three key aspects are analysed: the effect of standards on export supply; the link between standards, governance and distribution of rent along the value chain; and the social micro-processes of smallholder participation in this global value chain. Finally, the different institutional implications of standards are also discussed.

Key findings indicate that standards negatively affect export supply with rejections affecting exports in the short run and SPS measures affecting exports in the long run. Intricacies at the value chain level indicate that governance structures as a result of standards and subsequent power relationships influence the distributional outcomes of value chains with smallholders bearing the burden for compliance and reaping the lowest benefits comparatively. Participation of smallholders in these global chains is influenced by a number of factors including levels of capitalization, having contracts and belonging to a producer organization. The importance of intermediaries such as producer organizations, contracts and private public partnerships in capacity building, upgrading and linking smallholders to export markets is underscored.

NORMEN EN ONTWIKKELING: PERSPECTIEVEN VANUIT DE TUINBOUWEXPORT IN KENIA

Samenvatting

In dit proefschrift worden perspectieven ten aanzien van normen en ontwikkeling onderzocht in de tuinbouwsector in Kenia. Het debat over normen en ontwikkeling speelt een belangrijke rol in mondiale beleidsdiscussies. De toename van handelsnormen wordt vaak beschouwd als een bedreiging voor arme landen omdat die zou leiden tot minder exportmogelijkheden en een oneerlijke verdeling van de handelsopbrengsten en marginalisatie van arme boeren. Uit empirisch onderzoek kunnen echter verschillende conclusies over de effecten van normen op ontwikkeling worden getrokken. Het vermogen van ontwikkelingslanden om te voldoen aan internationale normen blijkt beslissend te zijn voor een succesvolle deelname aan de internationale handel. De Keniaanse tuinbouwsector speelt nog altijd een hoofdrol in de ontwikkeling omdat deze een directe bron van inkomsten uit export is voor vele klein- en grootschalige producenten, werkgelegenheid biedt en de op een na grootste deviezenbron van het land is. Het succes van deze sector is grotendeels afhankelijk van het vermogen van essentiële stakeholders om aan de vereisten van de markt te voldoen. Dit proefschrift presenteert de verschillende perspectieven ten aanzien van normen en ontwikkeling in de tuinbouwsector in Kenia met behulp van casestudy's die verbanden tonen en inzicht bieden ten behoeve van dit debat. Uit de verschillende

aspecten die worden geanalyseerd komen verschillende dimensies van het verband tussen normen en ontwikkeling naar voren. In dit onderzoek worden drie essentiële aspecten geanalyseerd: het effect van normen op de export, het verband tussen normen, governance en de verdeling van huur over de waardeketen, en de sociale micro-processen van deelname van kleine boeren aan deze mondiale waardeketen. Ten slotte worden de verschillende institutionele implicaties van normen besproken.

Uit de resultaten blijkt dat normen een negatief effect op de export hebben, waarbij afkeuringen de export op de korte termijn beïnvloeden en sanitaire en fytosanitaire (SPS)-maatregelen de export op de lange termijn beïnvloeden. Op het niveau van de waardeketen blijkt dat governance-structuren als gevolg van normen en de daaruit voortvloeiende machtsrelaties van invloed zijn op de verdelingsresultaten van waardeketens. Hierbij komt de last van de naleving vooral neer op kleine boeren en plukken die er in mindere mate de vruchten van. Deelname van kleine boeren aan deze mondiale ketens wordt beïnvloed door een aantal factoren, waaronder niveau van kapitalisatie, bezit van contracten en behoren tot een organisatie van producenten. Het belang van tussenliggende schakels zoals organisaties van producenten, contracten en publiek-private samenwerkingsverbanden bij het opbouwen van de capaciteit, opwaarderen en koppelen van kleine boeren aan exportmarkten wordt onderstreept.

1 Introduction

1.1 Background

The impact of standards and technical regulations[1] on trade is at the forefront of global policy discussions. Understanding the link between standards, technical regulations, and trade is crucial in the design of broader developmental goals that can create new opportunities for pro-poor growth (Wilson & Abiola, 2003). Income growth in developed countries has led to an increase in demand for high quality health, safety and ethical standards[2]. More recently, international campaigns against child labour and genetically modified food, Non-Governmental Organisation (NGO) environment activities and several food safety crises, such as the food dioxin crisis and the appearance of BSE in Europe, have contributed to a rising demand for high quality, safe and traceable products in the production chains of many nations (Swennen et al., 2008).

This demand for quality has led to a complex and costly process in the formulation of conformity and the enforcement of standards to producers. This is seen as a major constraint, especially for producers in developing countries. The high costs of compliance and certification have, therefore, excluded from global chains many small-scale producers. On the other hand, standards embody technological and innovative aspects that are passed down to developing countries and which

[1] In this research EU standards is used to refer to voluntary and market driven standards as well as technical regulations (both product and process standards) including those not directly related to health and safety such as worker welfare and ethical trading standards originating from EU.

[2] Generally, consuming countries require that many domestically produced and imported goods should satisfy certain minimum levels of quality, health and safety standards (Oyejide et al., 2000).

invariable help them upgrade their production, and thereby enable them to participate effectively in global chains thus improving incomes and poverty (Ibid).

Over the last few decades, many African countries, Kenya included, have intensified the implementation of export-led policies aimed at export expansion and diversification. Africa[3], being a primary commodity dependent producer has emerged to have comparative advantage in agricultural production including horticulture due to favourable climatic conditions, abundant land; and cheap labour. Horticultural exports have grown dramatically in many sub-Saharan African countries while many other agricultural commodities such as tea and coffee have faced stagnation and declining world prices. In addition, the horticulture industry provides an important source of foreign exchange, generates substantial employment and has contributed to the upgrading of agricultural production skills (McCulloch & Ota, 2002).

Further to this, in Africa, trade barriers, such as tariffs, and other non-tariff barriers like standards, undermine progress in the trade frontier. Standards[4] are the focus of this research. As such, developing countries rely on exports into foreign markets which require compliance with standards, rules and regulations set by these markets they are in effect standard takers rather than standard makers (Wilson, 2006) which places the burden of compliance on them. Findings from a study by Wilson in 2006 indicates that for most developing countries, the process of developing their own standards tends to be more costly as they typically have neither the public resources to provide national laboratories for testing and certification nor the capability for collective action to raise their own standards. A significant portion of meeting costs of standards are borne by individual firms and farmers (Wilson, 2006; Athukorala & Jayasuriya, 2003), which adds cost to firms and limits export competitiveness.

A study by Wilson & Abiola, 2003 argues that there are five main *'functions"* of standards:

[3] Kenya Included.

[4] Standards in this context are generally rules and regulations that govern the market for goods and therefore determine their suitability and acceptance in those markets.

(i) Standards act as a pre-requisite for market access and benefit largely those who are able to upgrade their production processes while excluding those who are not able to upgrade;
(ii) They determine competitive advantage especially when they involve costs as they may alter relative gains by producers.
(iii) Standards may also act as a medium for innovation, knowledge transfer and upgrading which leads to production of higher value products, which fetch higher incomes.
(iv) In some cases, standards may be seen as instruments of commercial policy –i.e. stringent levels of protection set by dominant interest groups, and may eventually monopolize the market, block market entry and exclude competition.

Greater market power in turn may be used to influence allocation of benefits that may accrue from the use of these standards. Thus, interest groups with less bargaining power and who are unable to participate in the rule making process become standard "takers" and in many cases may end up as "bearers" of compliance costs rather than "reapers" of benefits accrued to the standards (Wilson & Abiola, 2003). The study further argues that differences in institutional and financial capacities; infrastructure; human capital; consumer preferences and technological capacity may create a gap between standard setting countries and standard 'taking" countries and termed a "standards divide" which may alter the gains of trade in high value products.

Many empirical studies on standards and trade in developing countries have come to diverse findings (Swinnen, 2007; Maertens & Swinnen, 2009). Evidence from studies on supermarket chains suggests that these chains exclude smallholders due to issues ranging from non-compliance to inability to supply in large desired quantities (Sautier, Vermeulen, Fok, & Bienabe´, 2006). Others find very different effects such as the study by Minten, Randrianarison, & Swinnen (2006) that found that most FFV exports are produced on very small farms, often on a contract basis with the agro-food industry, and with important positive effects on farmers' productivity. Some studies in South Asia also find that due to standards, there is inclusion of smallholders in modern supply chains (Gulati, Minot, Delgado, & Bora, 2007), China (Wang, Dong, & Rozelle, 2006), and in Eastern Europe (Dries & Swinnen, 2004). Moreover, in several cases, this smallholder inclusion in modern

supply chains is associated with vertical coordination, leading to increased access to inputs, technology, and increased productivity and investments (Maertens & Swinnen, 2009).

Therefore, within development studies, two opposite perspectives on the developmental relevance of standards are emerging. The first focuses on the costs of compliance and exclusionary effects of standards, and standards are viewed as barriers to trade. The second perspective emphasizes the potential opportunities provided by the mainstreaming of standards and the likelihood that certain developing countries can utilize such opportunities to their competitive advantage. Clearly, the developmental aspects of standards can be two sided, but there still exists a gap in understanding these effects particularly with respect to different players such as firms, and smallholder farmers which make up a majority of producers in most developing countries, it is this gap that this study aims to shed light on.

From the above discussions, it is clear that empirical studies have mainly focused on the question of small farmers' contribution in supplying high-standards value chains and have failed to measure the overall trade and welfare effects of the standards at the various levels notwithstanding investigating the distributional effects of the standards. This study analyses the effects of standards on the Kenyan horticulture sector with a view to finding the different effects of standards on different aspects of development.

These investigation is centred around three main questions – i.e. whether and how standards affect exports in the sector; the subsequent outcomes related to the realities on the value chains i.e. how standards have shaped the distributional outcomes, more specifically, how benefits related to the adoption and compliance to standards are accrued to various actors in the chain; and at the micro-level, the factors that motivate farmer participation in these chains, the intermediaries they use, the sustainability of their participation; and finally the institutional implications of standards.

1.2 The Research Problem

In Kenya horticulture plays a vital role in development given the adaptability of a wide range of crops to many agro-ecological zones in the country. It is an important source of livelihood (including, incomes and employment) for over 2.5 million people either directly or indirectly. Of this total, farmers engaged in semi or commercial horticultural production is in the order of 80,000 who produce both for the domestic and export markets. The sub-sector is a major source of income having generated products locally valued at over 3.5% of the overall GDP, it also contributes appropriately 13 per cent to the agricultural GDP. In 2012 horticultural exports were valued at 870 million Euros. Despite the often-sluggish overall economic growth in the last two decades, horticultural production has continued to show impressive growth trends – approximately 6 per cent per annum and has subsequently become one of the most important Agri-food sectors that provides incomes to smallholders in Kenya.

The EU is Kenya's most important trading partner for horticultural produce and accounts for over 75 per cent of horticultural exports. In the past, Kenya benefited under the Cotonou regime from duty and quota-free market access for its horticultural produce, and more recently, in the year 2008/2009, through the Economic Partnership Agreements (EPAs). This has seen a rise in the value of horticultural exports by approximately 70 per cent in the past 10 years. Despite the growth in value, Kenya's horticultural exports continue to encounter constraints in international markets and local domestic supply, especially those directly affecting competitiveness. In recent years, the challenges of international competitiveness have moved well beyond the price and basic quality parameters to placing a greater emphasis on other market requirements such as standards and regulations in order to access markets in developed countries, more specifically the EU.

These market requirements take food safety beyond the checks and inspections of the end product. The new requirements are a consequence of consumer demand for assurance that food is safe – one of the strongest forces shaping today's agricultural production. Therefore, exporters not only have to comply with sanitary and phyto-sanitary

standards and maximum residue Limits[5] (MRLs) as required by the WTO, but they also have to deal with other market specific requirements such as environmental sustainability as well as traceability and labelling of produce that is embedded in EU's market requirements. A further new crop of standards driven by consumer organizations and Non-Governmental Organizations aim at pushing Multinational Corporations (MNCs) to adopt Corporate Social Responsibility (CSR) especially as related with labour standards including the use of child labour, worker welfare and gender equality in production of goods entering the EU market. Fair Trade labels have also lately played a major role in accessing certain niche markets by advocating for responsible production including observing social and environmental responsibility in return for a certain per centage of the premium prices to producers.

It is clear therefore, from the foregoing, that standards encompass a wide range of quality, health, environmental and ethical concerns, that are implemented as mandatory government standards, or as voluntary private standards. They diverge in terms of requirements for compliance and certification coupled with the fact that they (especially private voluntary standards) continuously change over time. This has an implication on the terms of trade, costs and benefits for compliance for the various stakeholders participating in the export business; investments in infrastructure needed for compliance and upgrading of production systems; learning effects; and institutional changes that occur in order to accommodate new compliance structures which are often diverse among different stakeholders and different sizes of farms and/or firms, and for different scope of standards.

[5] Maximum Residue Levels are the maximum amount of the trace residues of pesticides themselves, or their breakdown products, which are legally permitted in or on produce

1.3 Objectives and Scope

1.3.1 Objectives

The main objective of this research is to determine the impact of standards on the Kenyan horticultural export industry. It aims to provide insights on the different dynamics standards have on various aspects of trade-poverty and development on Kenya's horticultural exports industry:

1. To map out the industry's standards; the evolution and organization of compliance structures from top echelons of exports to smallholders' levels
2. To investigate the impact of standards on horticultural exports at the sector level, i.e whether standards have enhanced or reduced exports
3. To determine the distributional outcomes of compliance to standards at the value chain level, identifying the winners and losers and how the costs and margins of compliance to standards and the distribution of incomes and value added are determined at various levels.
4. The fourth and final objective is to provide insights into the micro-social implications of standards on producer participation in high value chains and the sustainability issues they face.

1.3.2 Scope and Context

The Country Context and Time Frame

The focal point of this study is based on the dynamics of different trade standards and different aspects of development in the horticultural sector in Kenya[6]. The sector is from an economic point of view, one of the most important foreign exchange contributors and subsequently, economic growth and development in agriculture. The sector also has numerous backward and forward linkages with many players including large and small-scale producers and is a source of livelihood to over 5 million people - 2.5 million directly and another 2.5 million indirectly.

[6] This is an agricultural related sector in a developing country.

Today, horticulture, at a rate of 6 per cent per annum, is the fastest growing agricultural sub-sector in Kenya and horticultural products have accounted for two-thirds of all growth in agricultural exports and has recently surpassed coffee to become the second largest merchandise export, after tea (Onjala & Otieno, 2010). Kenya is the second largest horticultural exporter in Sub-Saharan Africa (after South Africa), the second largest developing-country exporter of flowers in the world (after Colombia), and the second largest developing-country supplier of vegetables to the European Union (after Morocco).

Therefore, in Kenya today, export horticulture represents an opportunity for reducing poverty through income generation among smallholders, rural labourers on larger farms, and unskilled or semi-skilled factory workers. The EU is still the most important market for Kenyan horticultural products. Exports of fresh fruits and vegetables (FFVs) and cut flowers to the EU accounted for about 80 per cent of the total exports of FFVs and cut flowers from Kenya in 2009 and in 2013 it rose to 81 per cent.

However, the EU market has various trade standards that govern it and which farmers and exporters have to comply with in order to access this important market. Consumer concerns about food safety, resulting largely from food safety failures in the 1980s and 1990s have been one of the key drivers for standards and regulations (Dolan & Humphrey, 2000). These two decades were marked by a series of food-borne disease outbreaks in Europe linked to produce originating from developing countries; these include a Salmonella outbreak in the UK in 1989, an E. coli outbreak in fast food hamburgers in the United States in 1993, and Dioxin contamination of animal feed in Belgium in 1999 (World Bank, 2005). Importing countries have also become concerned about the introduction of pests through imports from developing countries. The EU, for instance, formulated and implemented Council Directive 2000/29/EC to control the introduction of pests and diseases harmful to plants and plant products. This directive requires that phyto-sanitary certificates accompany imported produce declaring them free of pests and disease.

With the rise in incomes in developed countries, specifically in the EU, the demand for more differentiated goods has led to the development of private standards. Consumer pressure, protection of brand image, stricter food regulation in the EU during the 1990s, and the

need for access to a due diligence defence drove retailers to develop strict commercial standards which encompass food safety and quality as well as environmental, and ethical concerns. Likewise, supermarkets in developed countries have responded to changing regulatory and demand conditions by seeking to meet consumer demands for all products (Dolan & Humphrey, 2000).

Consumer organizations and other Non-Governmental Organizations (NGOs) have also recently expressed ethical concerns in the production of goods in developing countries and this has consequently led to the proliferation of Social standards. These standards are however not mandatory requirements but are all the same, important if one wants to access certain niche markets. Therefore producers from developing countries, Kenya included, are faced not only with legal mandatory requirements but also numerous private voluntary standards. This has implications on certain factors that affect development such as transfer of technology, transaction costs, distribution of rent, institutional changes as well as terms of trade as will be discussed in this research.

The time frame of this research is limited to 1995-2012. This time frame is significant because: it is during this time that the horticulture sector picked up and became a major export sector important for the economy, it is also the period within which complete data on exports of horticulture to the EU can be obtained.

The Development Context

Development is a complex concept and often has many definitions. However a basic perspective equates development with economic growth. Chambers (1997) describes development as a process of social change that takes place after long periods of time and brings about economic growth that should translate into poverty reduction and general well-being. Economic growth is therefore seen as a *means* for achieving development but which cannot take place without qualified labour, technological innovations and advancements, trade and sound fiscal management (World Bank 2004) and the 'right' institutions (North, 1990). Furthermore proponents of sustainable development see it as a process of development by which specific needs of developing economies are met without destruction of the environment. It therefore

encompasses three constituent parts ie, economic, social and environmental and the equitable sharing of benefits.

In the context of trade, various trade-growth theories explain that for countries to achieve economic growth and development through trade, they must reach out to other markets through trade. The classical view, often associated with Adam Smith, is that free trade will lead to the most efficient use of a country's resources and therefore yield the highest national income. Trade improves economic performance by increasing competition and by giving domestic firms access to the best foreign technology, which can be adopted to raise domestic productivity. Trade contributes to productivity by forcing domestic industries to become more efficient. Trade increases competition in the domestic market, diminishing the market power of any firm and forcing them to behave more competitively. Competition also stimulates firms to improve their efficiency, otherwise they risk going out of business. A frequently mentioned concern is that trade liberalization or an open system of world trade may exacerbate world income inequality.

Developing country exports face a couple of barriers internally and externally which are conditioned by a number of factors reflecting marketing costs, tariffs, the costs of complying with both public and mandatory standards and other market requirements or government regulations (Josling & Roberts 2003). This raises trade costs and affects competitiveness especially for developing country producers and this has implications on their incomes. Furthermore, in order to access markets, producers must comply with the standards and regulations set by developed country markets. Often their compliance may stimulate not only firms to upgrade but also the domestic regulatory and institutional environment to improve efficiency and ultimately the competitiveness in the global market.

The horticulture sector in Kenya represents a typical sector in which the country has comparative advantage for production; is open to international competition and presents an opportunity for access to technology by complying with various standards; upgrading production and increasing incomes; and the development of domestic institutional and regulatory environment. However barriers such as *standards* which ultimately increase trade costs may affect exports and ultimately growth and poverty reduction; due to transaction costs related to compliance, standards may ultimately lock out non-complying and often smaller scale

producers from the market. Through value chains, different players have different roles and power relationships in these value chains may dictate the distribution of costs and incomes in the chains, thus income inequality becomes a key factor determining sustainable development in this sector.

In this study, we investigate three main constituents of development in the horticulture sector in relation to standards: the trade-growth effect of horticulture exports and whether standards lead to enhancing or diminishing exports; the income inequality effect in the high value chains (HVCs) i.e the cost-benefit effect of standards on the value chain participants and the distribution of costs and benefits in the value chains; finally we look at the sustainability of smallholder participation in these value chains through the social and economic lenses.

The time frame presented in this study runs from 1995 to 2012. The year 1995 is significant because it is the year that Kenya joined the WTO and thus started complying with WTO rules and regulations including standards. For data availability and reliability, 1995 presents the year when the Kenya Revenue Authority (KRA) was set up and proper data on exports by volume, value and destination were recorded. Shortly thereafter the country embarked on a major trade-poverty-export and development strategy which saw the horticulture sector become one of the major sectors selected for income generation and poverty reduction.

The Standards Context

The main focus of this dissertation is the effect of standards on horticulture sector exports where the main market for Kenya's products is the European Union. The global economy for export horticulture is increasingly structured around global value chains (GVCs) that account for a rising share of international trade, global gross domestic product (GDP), and employment. The horticultural value chain includes several segments: inputs, production, packing and storage, processing, and distribution and marketing. The chain is buyer-driven; the lead firms are large supermarkets in key markets in the European Union. The value chain is governed by public and private standards, which control sanitary and phyto-sanitary conditions, quality, quantity, traceability, and pesticide use. Through these standards, lead countries and firms determine which products are produced, how, and when, often shaping access to end markets, in this case *private supermarket standards* prevail. The main

standard is the GLOBALGAP (formerly EUREPGAP) which is a private standard encompassing traceability, quality and safety specifications, maximum residue limits and labelling and packaging.

Market access in the value chain is further regulated by trade agreements in this case (WTO). Governments tend to use instruments to protect their domestic markets and consumers and in this case *public mandatory standards prevail such as the EU regulations on food and feed.* These also specify maximum residue limits, phyto-sanitary requirements, packaging and labelling according to EU regulations and also include Technical Barriers to Trade (TBT) measures.

This dissertation does not look at ethical standards, labour standards or fair trade standards that may attract premiums. The focus of this dissertation is both public mandatory and private standards that prevail in the horticulture sector. The scope of standards is wide and depending on the case study approach used in this dissertation, it will vary for each of the empirical chapters. For the first empirical chapter, the study analyses the effect of standards on export volumes. The second empirical chapter will use a case study of the green beans value chains to analyse how GLOBALGAP and other EU regulations related to SPS and MRLs will determine governance structures and distribution of margins along the value chain. Both product and process standards are taken into consideration. The final empirical chapter looks at smallholder participation in global value chains and looks at standards as a whole.

1.4 The Questions

The main question in this research is – what is the link between standards and development in Kenya's horticultural exports sector? And what are their dynamics with respect to trade effects, distributional outcomes and inequality and social micro-processes of sustainable participation of smallholders?

The results of this study can be used to facilitate four important questions.

- What is the scope and context of standards in Kenya's horticulture sector? What is the typology of standards in the sector and related compliance structures, and what are the

implications on organization of the sector and the institutions?

- Are EU standards and regulations trade restricting or enhancing? Have EU regulations led to a decrease or increase in the export of horticultural produce in Kenya?
- Who are the winners and losers in high value chains and what are the distributional outcomes with respect to costs and benefits?
- What can be learned at the micro-level from smallholders that choose to export and therefore comply with the standards? What affects their choices and what intermediaries do they use to mitigate the costs related to compliance?

1.5 Case Studies, Methodology and Data

1.5 .1 Case Studies Approach

In order to comprehensively capture the effects of EU standards on Kenya's Horticultural exports Industry[7] case studies that answer each of the research questions have been used and both quantitative and qualitative methods applied.

A multi-Stage Approach:

The research relies on both secondary and primary data. Secondary data has been obtained from various sources including various databases. A farm/firm-level survey was done to capture primary data and specifically to provide information for the various stages of the analysis, which also form the basis of various chapters of this study.

The first part involves the identification of EU standards that are applicable on Kenya's horticulture sector; and the analysis of their key features i.e. determine what standard each specifies, whether these are processes or performance standards or both, what conformity assessment procedures are used to enforce the standards, how and where are the procedures implemented. Furthermore the different sets of

[7] Agricultural products are for the various product groupings namely, Fruits, vegetable and cut flowers.

standards are analysed to determine their typology, their origin and their modes of compliance and their regulatory and institutional implications.

The ***second part*** is a case study that focuses on the effects of standards on trade at a macro-level. Information from part one is used to identify the set of standards that the sector complies with based on WTO notifications for the mandatory standards and other private standards and the number of rejections of export produce due to non-compliance. This analysis is quantitative and determines the effects of standards and other macro-economic variables on export supply. An econometric model is used to estimate the effects of standards on various product groupings (Fresh Fruits and Vegetables and Cut Flowers) exported to the EU. This is aggregated at product level for the period[8] 1995 to 2012.

The ***third*** case consists of the analysis of the value chain dynamics of standards using the sector's green beans value chain as an illustrative case. It determines the key value chain actors and activities while estimating various cost and revenue margins that are related to both inputs and outputs for different actors. The cost implications of meeting standards and the return on investments are determined and compared across actors to show how value and rent is distributed. The main technique applied is a combination of value chain analysis and an input output - *filiere*, and is mainly drawn from primary data collected from various chain actors.

The fourth and final case analyses the social micro-processes that have been formed in order for smallholders to comply with standards and participate in the export chain. It involves the use of primary data collected from smallholders to analyse their motivation to participate in the horticultural exports value chain as well as their cooperative behaviour associated with the formation of market intermediaries to mitigate on costs of meeting standards.

[8] The selected period 1995-2012 has been done because the horticultural industry flourished in the year beginning 1995.

1.5.2 Data

Primary and secondary data sources involving both qualitative and quantitative data are used.

Secondary Data

Secondary data was obtained from various sources. HCDA provided time series data on exports by category ie cut flowers, fresh fruits and vegetables by volume, value and destination. This data was supplemented by data from EUROSTAT and Kenya Revenue Authority (KRA) to fill in any existing gaps. Standards data was obtained from WTO database on standards notifications, and the PERINORM data base, and Rapid Alert System for Food and Feed (RASSF). World Bank provided data on other economic variables such as FDI inflows. GDP, Exchange rates and FDI were obtained from the Kenya National Bureau of Statistics (KNBS).

Primary Data: The Survey

Primary data was collected in two phases during the fieldwork process in 2008. The first phase mainly involved the quantitative data collection and the second phase involved qualitative data collection from key informants and focus group discussions (FGDs) with farmers. The Survey took place in 5 provinces over 9 districts (Table 1.1). The target sample was 250 respondents 63 exporters (whole population sample) and 187 farmers. The Survey was done with coordination with the Ministry of Agriculture (District Agricultural offices) as well as the HCDA, which played a crucial role in providing networks through which Producer organizations and farmer groups were interviewed. HCDA field officers also played a critical role in acting as "guides" to various places and providing a sampling frame for each district. For Nairobi the 18 respondents included the export firms - both briefcase exporters and integrated pack-houses.

Sampling Methodology

Simple random sampling was done in 9 districts where horticulture is the main income generating activity. The sampling occurred in 3 main stages:

1. *Purposeful selection of provinces (districts) where horticulture is the main economic activity*

2. *Determining the sample size for each district*

3. *Sample selection of farmers for surveying using a sampling frame provided by HCDA and District Agricultural Officers*

The sampling done was in proportion to size using a sampling frame provided by HCDA for each district. The sample size was calculated for each district and farmers selected randomly using excel.

Table 1.1: Farmers Sampled per Region

District	*Province/Region*	*Total Population*	*Sample Size*
Mwea	Eastern	317	30
Meru	Eastern	287	28
Kibwezi	Eastern	178	18
Sagana	Central	267	27
Limuru	Central	257	26
Nakuru	Rift Valley	178	18
Naivasha	Rift Valley	197	20
Taveta	Coast	168	16
Total		**1850**	**187**

In Nairobi province, although 63 exporters (the total population of registered exporting firms) had been targeted for interviews, only 14 exporters accepted to be interviewed. They included 5 brokers (middlemen) that do not own farms but export produce, 7 large scale producers that export and have large farms, and two medium to small scale producers who export and own pack houses (Table 1.2). The response rate was very low for exporters. However, out of 187 targeted farmers interviewed, 181 valid responses were obtained.

Primary Data Farm Level Survey

Out of the total 201 respondents interviewed in the primary survey, 181 were smallholders with land sizes ranging between 0.25-10 acres, 6 medium scale producers with an acreage of 10-20 acres but do not own pack houses; 2 small scale exporters who own pack houses and have farms of their own; and 7 large scale producers with land ranging between 50-5000 acres who export their produce directly. Five brokerage firms (middlemen) were also interviewed (summary Table 1.2). The middlemen own pack-houses, they buy their produce from smallholders and export it after meeting the required packaging and labelling standards. They also have contracts with some supermarkets in the EU where they supply fresh produce even though they do not have farms or

grow any of the produce. At least 22 such companies were identified but only 5 were willing to be interviewed.

Table 1.2: Summary Statistics for Producer and Exporter Categories

Type of producer/ exporter	Number interviewed	Land size in acres	Average land Size acres	Area Under Horticulture (% of total land)	Average Labour Force	Family Labour (% of total family labour)
Smallholder farmers	181	0.25-10	2.05	79	5	47
Medium scale farmers who do not own pack houses	6	10-20	11.6	67	15	5
Medium scale producers who export and own pack houses	2	20-25	22.5	95	189	1
Large scale producers and Exporters	7	50-5000	2341	100	412	0
Middlemen/Brokers (with pack houses)	5	No land	None	None	238	0

Source: Survey, 2009

A total of 128 farmers grow vegetables for export in Nyeri, Embu, Meru, Mwea, Sagana and Limuru. Most farmers grow upto three main vegetables. The French bean is the most commonly grown vegetable by 62 farmers. Thirty (30) grow snow peas, 36 Rafaya, 20 baby corn and 18 okra for export. A total of 31 farmers grew tomatoes for the local market alongside their export vegetables. Fruits are grown mainly in Taveta, Kibwezi and Mwea. The main export fruits are passion fruits, mangoes and oranges. Thirty eight (38) farmers grow passion fruits, 31 grew mangoes for export to the Middle East and 27 grow oranges for exported to the Middle East. Farmers in Mwea, Meru and Taveta also grew bananas for the local market alongside their export fruits.

Flowers were mainly grown my medium and large scale farmers. Four (4) large scale farmers said during the interview that they grow mainly flowers for export and 3 grew French beans and snow peas and 15 smallholder farmers grew flowers for export through their producer

organizations. Two (2) medium scale farmers who grow vegetables (mainly green beans and snow peas) have pack houses on their farms where all the value addition is done and to boost their export volumes they have supply contracts with smallholder groups. Exporters also had contracts with large and small retail supermarkets in the EU – Spar and Carefour in EU countries, Albertheijn in Netherlands; Waitrose, ASDA and Tescos in the UK; Carefour, and Delhaize in Belgium.

Some exporters prefer to have contracts with farmers only through their producer organizations. The terms of contract are negotiated between farmers and exporters. On the hand, exporters who have contracts with main supermarkets in the EU, have contracts that specify the different products they will supply, quantities, quality of the produce, packaging and labelling requirements, prices, traceability requirements and sanctions related to breach of contract. Sixty nine (69) per cent of smallholders belong to producer organizations. A total of 18 producer organizations with a membership of between 15 to 50 farmers were interviewed.

Key Informant Surveys and Focus Group Discussions (FGDs)

Key informant interviews involved mainly key government officials in various ministries and departments, key government officials involved in the implementation and administration of standards in various standardization, testing and certification bodies, key industry players involving producer organizations and umbrella bodies, credit facilities, airports authorities and export promotion agencies.

The final stage involved focus group discussions with producer organizations. Appendix 2.1 gives a summary of the key informants' interviewed from various institutions. FGDs supplemented primary data and a total of 18 producer organizations were also interviewed (Appendix 5.1)

1.6 Limitations and Challenges of the Study

The study is not without its limitations. First, the context of development is wide and has many implications including poverty and welfare effects; distributional effects and sustainability issues. However, this thesis does not consider the general equilibrium effects of standards and subsequently trade within the sector or on the economy in general. In this regard, this is a country and sector specific case study that looks at the horticulture sector in isolation. This approach has its benefits in that it allows the scrutiny of the effects of standards on the sector. While looking at the effects of standards on export supply, other macro-economic variables that might affect export supply are taken into consideration. The study does not analyse the effect of standards on welfare and poverty mainly because these factors have already been analysed by numerous researchers. The scope of standards is also limited to those that directly affect costs of production and directly affect smallholders, the most common being GLOBALGAP and other mandatory requirements such as the Maximum residue Limits (MRLs). In this regard, the study does not focus on labour, ethical, or other standards.

Second, challenges faced in data collection also limited the analytical approaches that could have been used. For instance the majority of exporters were not willing to give information regarding their production costs or margins. This made it difficult to analyse the cost-margin component as had been envisioned. This limited the study to the use of an input-output analysis of costs and margins using data from a few of the exporters that agreed to provide the information.

1.7 The Chapters

The thesis is organized as follows: the preceding section is an outline of the introduction and sets the pace for this study. It gives the research questions, objectives and scope and an outline of the methodology which will be used to answer the research questions. The second chapter presents the conceptual framework used to analyse the different effects standards on trade. It provides a theoretical background and gives an

overview of the standards–development debate as is conceptualized in this research.

Chapter 3 mainly presents the typology of standards and their implications on Kenya's horticulture sector. Also covered in this section is an outline of the value chain participants and their relationships; the key standards and stakeholders involved in their implementation; and the key institutional dynamics related to standards implementation in Kenya's horticulture sector.

Chapter 4 is an empirical chapter that gives an overview of the effects of standards on the horticulture sector, and their impact on the level of exports. The chapter investigates whether standards are export enhancing or reducing while also taking into consideration other factors that may affect exports.

Chapter 5 uses a case study of the green beans value chain to analyse value chains effects of standards i.e the distribution of costs vs. benefits and distributional outcomes along the value chain for the different types of chain participants. The margins (which include both costs and standards margins) are compared with the distribution of revenue and profits obtained as a result of compliance to the standards. The method applied here is a combination of a value chain approach with a simplified input/output accounting matrix.

The final empirical chapter 6 analyses the participation of 181 smallholders in the value chains and the market intermediaries that prevail in this value chain using a regression analysis of factors that in theory may influence their participation and subsequent compliance with standards in order to access the export markets. In order to understand the sustainability of smallholder participation in these chains, special attention is paid to market intermediaries in the sector.

Chapter 7 gives a summary of the empirical findings of the study and how these are linked to various aspects of development and participation in the export value chains. It provides a summary of the answers to the research questions outlines the methods and approaches used to arrive at the answers and sums up the study. It will indicate whether these answers can in future have policy implications for participation in global export value chains.

2 Context and Framework for Analysis

2.1 Introduction

In its basic form, economic theory suggests that gains from trade arise when countries specialise in production of those goods to which they are best suited, thereby earning export income that allows for poverty reduction. However, trade takes place under certain important market conditions such as imperfect competition, economies of scale, and distortions in factor markets which affect various segments of its participants who may lose or gain from trading in certain specialised products therefore creating winners or losers in a globalized trading system. In this regard it is assumed that access into global markets and increase in exports will invariably lead to reduction in poverty and consequently, development.

Owing to a fall in prices of traditional exports such as tea, coffee and cocoa, there has been a dramatic shift from exporting these traditional cash crops towards high value fresh fruits and vegetables; which in recent years have become rapidly growing ventures for many producers and exporters in developing countries (Temu & Marwa, 2007). This rapid growth and expansion can be attributed to the need to fulfil demand for exotic and out of season products in the EU and other Western countries. However, these consumers and producers have become sensitized to health, safety and environmental concerns; which are embedded in the products as standards. Accessing these markets requires compliance with standards comprising of a strict regulatory framework of measures designed to ensure not only human and plant health but also environmental and ethical issues which sometimes go beyond the international requirements set under the SPS and TBT agreements administered by the WTO (Maskus et al. 2005).

A major concern about these new global developments and trade is that they may accelerate growth but the poor may not benefit proportionately. Global literature on standards in high value chains argues that standards are causing new non-tariff barriers (NTBs) and may be trade reducing instead of enhancing (Wilson & Otsuki, 2001).

The second concern is that benefits accrued from the compliance of standards may be distributed disproportionately especially when costs of compliance and due diligence are pushed downstream (Dolan &Humphrey, 2000). The third concern is that standards increase the marginalization of smallholders and may lead to their exclusion from high value chains, income generation and poverty reduction (Unnevehr 2000). In addition, standards have increasingly been used in the governance of global agri-food chains, shaping the coordination mechanisms and ultimately changing the rules of the game for producers and exporters (Ouma, 2010, Graffham et al. 2007, Henson et al 2009). On a positive note, some authors have recognized the importance of standards in upgrading of production chains and increasing competitiveness (Gereffi et al, 2001). Another positive study linking standards to development has demonstrated the ability of standards to stimulate institutional change in response to requirements for certification and accreditation (Otieno & Knorringa, 2012).

This chapter that comprises three parts discusses the relevant concepts and the study's main analytical framework. The *first part* begins with a discussion on the global context of standards, regulatory measures and their link with development. It analyses the typology of standards, their modes of compliance and processes involved and looks at how standards are linked to development. The *second part* sets out the main theoretical and analytical framework of the study and the analytical approach that will be used to answer the research questions. The final part concludes by summarizing the key issues arising from the two parts.

2.2 Global Context of Standards and Their Link with Development

2.2.1 Definition and Classification of Standards

Standards can be defined as a limit or rule that is approved and monitored for compliance by an authoritative agency or professional or recognized body as a minimum acceptable benchmark. Standards may be classified as (1) government or statutory agency standards and specifications enforced by law, (2) proprietary standards developed by a firm or organization and placed in public domain to encourage their widespread use, and (3) voluntary standards established by consultation

and consensus and available for use by any person, organization, or industry (Figure 2.1) (den Butter et al, 2007). The WTO defines standards as

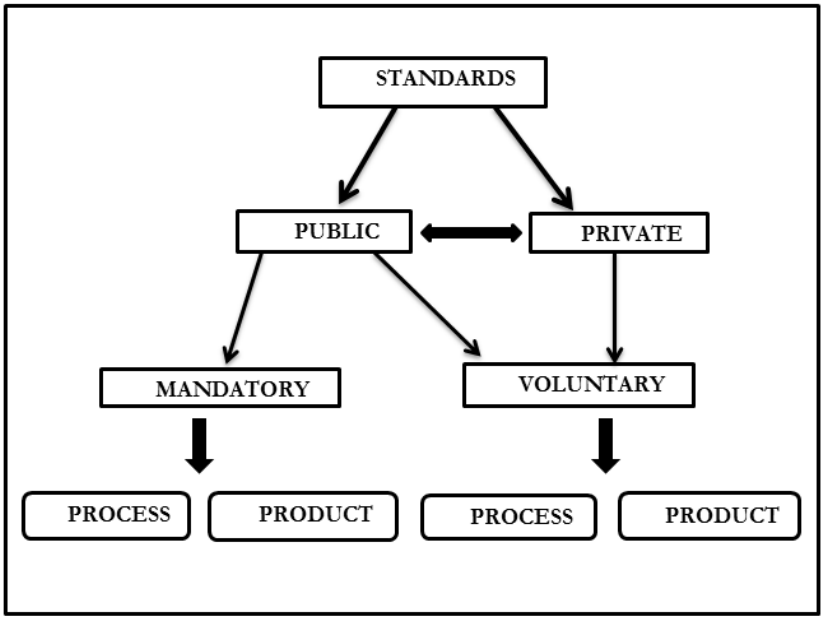
"Technical specifications contained in a document that lays characteristics of a product such as levels of quality, performance, safety, or dimensions. Standards may include or deal exclusively with terminology, symbols, testing and methods, packaging, or labeling requirements as they apply to a product."

Standards are therefore the language of trade and have many roles and functions. Not only do they establish a common trading language between buyers and sellers, but they also ensure public safety and the protection of the environment within and outside national borders. Moreover, in today's globalized production systems, standards ensure that parts produced across borders fit and that networks are compatible. Emerging standards are both complex and dynamic, incorporating features that go beyond simple quality, to less apparent characteristics of product safety, environmental management, and human rights (Kaplinsky, 2006). More recently, standards have also been driven by a philosophy, which integrates profitability with continual improvement in environmental and social performance in everyday business practices.

Public Mandatory vs. Private and Voluntary Standards

Standards can be classified into several categories depending on their function or the way standards originate as summarized in the figure below. The first distinction made in figure 2.1 is between public and private standards. This classification refers to the way standards originate. Whether the *market* responsible for their development or if it is a *government* initiative. A *private standard* is a standard, which primarily focuses on the interests of the private stakeholders that develop the standards. These stakeholders will only take the interests of consumers into account to the extent that it benefits their own interests (den Butter *et al*., 2007).

Figure 2.1: Classification of Standards



Private standards are therefore voluntary in that there is no legal recourse for failure to comply. However *public standards* are government initiatives and the government has the ability to make the standards *mandatory* through the introduction of legislation (Ibid). This is in contrast to *voluntary standards*. The distinction made in figure 2.1 is that between standards that are related to products and those related to production processes. *Product standards* are requirements with respect to some characteristics of the product itself, they are verified through quality control of finished products. *Process standards* are standards that prescribe how certain steps in the production process should take place and most often are enforced through regular inspections of the processes. Producers in developing countries thus have to comply with both public and privates standards in order to access the export market in the EU.

Recently, literature form Henson & Humphrey (2010), further classify standards according to who sets them and who is ultimately

responsible for overseeing their implementation. They identify three main categories: Individual firm standards e.g. Nature's Choice (Tesco) which are developed by large retailers and adopted along their supply chains and require private labelling; Collective national Standards e.g. Kenya Flower Council, set by collective national organizations and may represent interests of commercial entities; and Collective international standards e.g. GLOBALGAP, BRC etc. which are set by international collective organizations, industry associations, NGOs and independent standards setting bodies. They are designed to be adopted and implemented internationally. The authors also suggest that private standards go beyond public regulations by addressing issues that go beyond public regulations e.g. fair trade and they may have additional attributes that are desirable for certain niche markets. Private standards also provide a 'reinforcement' of public standards e.g. food safety and health standards of GLOBALGAP or BRC provide additional layers of supervision, certification and accreditation, which traverse regulatory jurisdictions but none the less provide additional assurances to consumers and retailers that rules will be adhered to.

Public Mandatory Standards: WTO Rules and Regulations

SPS Measures and the WTO

Sanitary and Phyto-sanitary (SPS) measures are applied to protect human, animal and plant life or health from risks arising from the introduction and spread of pests and diseases and from risks arising from additives, toxins and contaminants in foods and feedstuffs. SPS measures are subject to rules set under the World Trade Organization (WTO). In particular, the use of SPS measures is governed by the provisions of the WTO Agreement on the Application of Sanitary and Phyto-sanitary Measures (the SPS Agreement). Therefore, all countries that are signatories of WTO ascribe to the principles of the WTO and have to meet WTO requirements including SPS Measures. Kenya joined and became a signatory of WTO in 1995. These requirements basically cover food safety and health standards also[9] as well as Codex

[9] The Agreement on the Application of SPS Measures sets out the basic rules for food safety and animal and plant health standards. It allows countries to set their own standards. But it also says regulations must be based on science. They should be applied only to the extent necessary to protect human, animal

Alimentarius[10] standards and Hazard and Critical Control Points (HACCP)[11] standards.

The SPS Agreement provides WTO member countries with the right to use SPS measures to protect human, animal and plant life or health. Each WTO member country is also charged with maintaining a level of protection it considers appropriate[12] to protect life or health within its territory. The SPS Agreement applies to all SPS measures, which may directly or indirectly affect international trade. The right to adopt SPS measures is accompanied by obligations aimed at minimizing the negative impacts of SPS measures on international trade. The basic obligations are that SPS measures must:

- be applied only to the extent necessary to protect life or health and not be more trade restrictive than required;
- be based on scientific principles and not maintained without sufficient scientific evidence, and
- not constitute arbitrary or unjustifiable treatment or a disguised restriction on trade.

Article 3 and Article 5 of the SPS Agreement give provisions where members are permitted to adopt SPS measures which are more stringent than the relevant international standards or adopt SPS measures when international standards do not exist, provided the

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or plant life or health. And they should not arbitrarily or unjustifiably discriminate between countries where identical or similar conditions prevail. (WTO, 1998).

[10] The Codex Alimentarius Commission (CAC) is an intergovernmental body to implement the Joint FAO/WHO Food Standards Programme, which was established by an FAO Conference resolution in 1961, and a World Health Assembly resolution, (WHA) 16.42, in 1963. Its principle objective is to protect the health of consumers and to facilitate the trade of food by setting international standards on foods (i.e. Codex Standards) and other texts, which can be recommended to governments for acceptance.

[11] HACCP standards on the other hand are standards that are developed in order to prevent hazards that could introduce potentially dangerous food-born illnesses in food by applying science-based controls that cover all aspects from raw resources through preparation to final product

[12] This is called the appropriate level of protection (ALOP).

measures are based on scientific risk assessment; consistently applied; and not more trade restrictive than necessary. These provisions have hence led to many developments in the standards arena has seen an introduction of a myriad of other standards not related to food safety and health but equally important for producers to access consumer markets.

The Technical Barriers to Trade (TBT) Agreement

According to the TBT Agreement, a standard is a set of rules, guidelines or characteristics for products or related processes and production methods (provided for common and repeated use) approved by a recognized body with which compliance is not mandatory. It may also include or deal exclusively with terminology, symbols, packaging, marking or labelling requirements as they apply to a product, process or production method. The scope of the TBT Agreement covers all products both industrial and agricultural except services, SPS measures and purchasing specifications for consumption by governments. The agreement therefore provides for both mandatory and voluntary standards.

Principles of the Agreement include: non-discrimination; avoidance of unnecessary obstacles; harmonization; equivalence; mutual recognition and transparency. However, the agreement also recognizes countries' rights to adopt the standards they consider appropriate - for example, for human, animal or plant life or health, for the protection of the environment or to meet other consumer interests. Harmonization as outlined in article 5.5 requires members to have National Enquiry Points (NEP) to act as national reference points for harmonization and notification of new standards.

Through the TBT Agreement, members have expressly accepted a number of obligations in relations to the conduct of non-governmental bodies[13]. Article 4 lays down obligations in relation to the preparation, adoption and application of standards by non-governmental bodies. The type of requirements in Article 4 partly mirrors those in Article 13 of the SPS Agreement where members must "take such reasonable measures as may be available to them to ensure" that non-governmental bodies comply with obligations that are largely similar to those set forth

[13] Defined as bodies "other than a central government body or a local government body" TBT Agreement, Annex 1, paragraph 8.

by the TBT Agreement for governmental measures; and *"not take measures which have the effect of … requiring or encouraging non-governmental bodies to act in a manner inconsistent with those obligations. Article 4 further specifies that the obligations of Members with respect to compliance of standardizing bodies with the provisions of the Code of Good Practice shall apply irrespective of whether or not a standardizing body has accepted the Code of Good Practice".* Moreover, Article 14 of the TBT Agreement provides that the WTO dispute settlement provisions *"can be invoked in cases where a Member considers that another Member has not achieved satisfactory results and its trade interests are significantly affected. In this respect, such results shall be equivalent to those as if the body in question were a Member".*

2.2.2 The Link between Standards and Development

Standards in many cases are public goods. For this reason, they must serve to solve common problems, generating joint consumption benefits for the public. Standards facilitate comparisons by consumers across products with common essential characteristics (Maskus & Wilson, 2000). Product and process standards are necessary because they contribute to the provision of public goods for which people have preferences. Standards also improve the flow of information between suppliers and consumers about the characteristics and quality of products, thereby facilitating market transactions. In this regard, standards are designed to facilitate information exchange and ensure quality. For example, sanitary standards contribute to public health. Sanitary and phyto-sanitary requirements can improve health and quality of life with spill over benefits into higher productivity, as well as expanded export opportunities (Wilson, 2001).

Principles of the agreement include: non-discrimination; avoidance of unnecessary obstacles; harmonization; equivalence; mutual recognition and transparency. However, the agreement also recognizes countries' rights to adopt the standards they consider appropriate - for example, for human, animal or plant life or health, for the protection of the environment or to meet other consumer interests. Harmonization as outlined in article 5.5 requires members to have National Enquiry Points (NEP) to act as national reference points for harmonization and notification of new standards.

The role of standards in the value chain has been discussed as important in improving efficiency through quality cost and delivery

(QCD), but also through meeting demands of high-income economies that are largely the "drivers" of these standards (Kaplinsky, 2006). This results in firms demanding performance by their suppliers and the threat of exclusion for non-performance but it also raises costs for complying firms. When products and processes become more standardized, transparency increases and trade becomes more predictable and easy to control, thus reducing costs involved in transactions (Kaplinsky, 2006; Tander & Tilburg 2007; Busch, 2000). Implementing standards can therefore improve operational and managerial efficiency.

Standards also have technological and innovative features embedded in them and hence the process of complying *to standards lies in the transfer of advanced production capabilities to low-wage economies* who in turn gain by acquiring knowledge through spill-overs and 'learning by doing' (Grossman & Helpman, 1989). This process enables small firms/farmers to *upgrade* their production, thereby resulting in increased incomes.

With the emerging and increasing demanding for health and safety standards over and above the governmental standards in the EU, private sectors are imposing additional standards in order to protect their safety reputation and also to *differentiate themselves from competitors.* Retailers have also imposed many requirements informally through individual supply chains (Jaffe & Henson, 2004) and hence exporters are concerned about the cost of monitoring a large number of smallholders for compliance with increasingly strict regulations. These safety standards have thus created immense constraints for existing exporters/suppliers while raising the bar for new entrants into the market. Therefore as standards increase in number, complexity and stringency, they have a direct impact on competition and market access and hence those firms that are unable to fulfil all requirements are faced with export supply constraints and risk exclusion (Tander & van Tilburg 2007).

Some Authors (Wilson, 2001; Wilson & Abiola 2003), have also pointed out that *countries use regulation for protectionist purposes*. Technical regulations may discriminate against foreign suppliers, both in their construction and in their outcomes. They may be used to gain strategic trade advantages for domestic firms over foreign competitors. Standards are often non-transparent and in some cases needlessly force

firms to duplicate testing and certification costs. Regulations may be drafted to exclude both domestic and foreign entrants into a particular market, which then serves to support entrenched monopolies.

Standards - particularly those that require independent certification - intrinsically fulfil many of the broader requirements for producers to participate in global supply chains or compete in high-value products. For example, detailed record keeping of production inputs, traceability, and third party monitoring that are part of organics and GlobalGAP are also useful in improving chain competitiveness and more effective participation in lucrative markets. *Sustainability-oriented standards* appear to have some additional benefits for farmers. For example, several recommend diversification from dependence on a single cash crop, thereby reducing a producer's risk of crop failure. Environmental standards also help to ensure sustainable production and are beneficial to farmers (Okello, 2005).

More recently *ethical standards like fair trade* have been used to promote social justice. Fair trade standards resulted from developed country consumers concerns over the progress of development through global trade. It is therefore a market-based mechanism aimed at improving the lives of producers in developing countries. Fair trade has been seen as a mechanism through which producer's needs can be addressed. It incorporates equity in supply chains by addressing market failures and their social impacts at source (Nicholls & Opal, 2004). Other recent ethical standards have also included labour standards that ensure conducive and humane working conditions, fair wages and non-exploitation of children in farms.

In view of this, producers and exporters operate in an environment full of uncertainties. Concerns related to food quality and safety; resource use, land degradation and environmental pollution as well as labour and worker welfare continue to dog the sector in many ways. While standards may at the same time pass knowledge and information necessary for producers to participate in global chains, they may also act as "barriers" to trade and increase transaction costs for exporting firms.

2.2.3 The Nature and Extent of EU Standards

In the EU, consumer concerns about food safety, resulting largely from food safety failures in the 1980s and 1990s has been one of the key drivers for standards and regulations (Dolan & Humphrey, 2002). These two decades were marked by a series of food-borne disease outbreaks in Europe linked to produce originating from developing countries; these include a Salmonella outbreak in the UK in 1989, an E. coli outbreak in fast food hamburgers in the United States in 1993, and Dioxin contamination of animal feed in Belgium in 1999 (World Bank, 2005). Importing countries have also become concerned about the introduction of pests through imports from developing countries. The EU, for instance, formulated and implemented Council Directive 2000/29/EC to control the introduction of pests and diseases harmful to plants and plant products. This directive requires that by phyto-sanitary certificates accompany imported produce, declaring them free of pests and disease. Likewise, supermarkets in developed countries have responded to changing regulatory and demand conditions by seeking to meet consumer demands for all products (Dolan & Humphrey, 2002). Consumer pressure, protection of brand image, stricter food regulation in the EU during the 1990s, and the need for access to a due diligence defence drove retailers to develop strict commercial standards which encompass food safety and quality as well as environmental, and ethical concerns as will be discussed below.

EU Food and Safety Regulations

In the aftermath of the Bovine Spongiform Encephalopathy (BSE) crisis and several other food scandals, the EU published its *White Paper on Food Safety* setting out a legislative action plan for a pro-active new food policy. Key elements in the new approach were the establishment of a framework regulation, the establishment of an independent body providing scientific advice to the legislators, the development of specific food and feed safety legislation including a major overhaul of the existing hygiene legislation, and the creation of a framework for harmonized food controls. As a result of this, in January 2002, the European Parliament together with the council of the European Union, passed the EC Regulation number 178/2002 laying down the general principles and requirements of the food law and establishing the European Food Safety Authority and laying down procedures in

matters of food safety (Official Journal of European Communities 2002a).

The new legislation adapted an integrated approach to food safety known as *"from farm to fork"* which lays the primary responsibility of food safety on producers and retailers and encompasses traceability – as the basic principle; transparency; risk analysis and risk assessment using the best scientific evidence and the precautionary principle. This legislation also gave responsibility to the European Food safety authority for scientific and technical advice as well as passing information to the community. Implementation of the legislation therefore, resulted in frequent checks on imports as well as inspections in countries exporting to the EU.

The white paper on food safety outlines a radical revision of EU food hygiene rules. It developed a "hygiene package" with the aim of merging, harmonizing and simplifying very detailed and complex hygiene requirements scattered over 17 directives. The overall aim was to create a single hygiene regime covering food and food operators in all sectors, together with effective instruments to manage food safety and any possible food crises, throughout the food chain. Food producers would bear primary responsibility for the safety of food through the use of a Hazard Analysis and Critical Control Points (HACCP) system. It also had requirements for food establishments to be registered or to be approved by competent authorities, which should have control systems in place in order to verify the food law in general and food hygiene in particular. These requirements came into force on January 1st 2006.

Voluntary and Private Standards in the EU

Consumer pressure, protection of brand images and stricter food regulations in the EU, and the need for access to a due diligence defence, drove retailers to develop strict commercial standards. Governments tended to respond by adopting stricter legislation placing the liability for food contamination on the industry and retailers (e.g. the 'due diligence' requirements in the United Kingdom). In turn, retailers and food manufacturers sought to make their suppliers responsible for the safety of their products, notably through the development of standards for good agricultural practices and good manufacturing practices and the requirement that suppliers be certified. In some cases, firms have developed standards individually (e.g. Carrefour's "filière

qualité"), while in others they have acted collectively (e.g. the Sustainable Agriculture Initiative was created by leading global agri-food firms such as Nestlé and Danone to pursue mutual sustainability interests while some European supermarket chains formed the Euro-retailer Produce Group to develop the (EUREPGAP) standard which then evolved to become the GLOBALGAP standard.

The GLOBALGAP (EUREPGAP) Standard

The *GLOBALGAP* code for the production of fresh fruits and vegetables was first introduced in 1996 by a group of eleven British and Dutch retailers and was initially referred to as *EUREPGAP*. Its main objective was to create a single private sector standard. *EUREPGAP* certification can be given either to an individual grower or to a marketing organization attached to an exporter (Okello, 2005). Some of these regulations included Phytosanitary measures; conformity to quality standards, labelling and traceability requirements; Maximum Residue Limits (MRLs); new organic inspection requirements.

GLOBALGAP[14] is key reference for Good Agricultural Practice (GAP) in the global market that translates consumer requirements in agricultural production with an aim to establish one standard for GAP. These requirements reflect both the technical regulations laid down by governments and the private standards of major supermarket chains - the latter of which are employed both to manage regulatory and liability risks and as the basis of product differentiation. Existing national or regional farm assurance schemes are required to benchmark their processes on GLOBALGAP standards (GLOBALGAP, 2009).

GLOBALGAP is a single integrated standard with modular applications for different product groups, ranging from plant and livestock production to plant propagation materials and compound feed manufacturing. It integrates all agricultural products into a single audit (GLOBALGAP website, 2009). It also encompasses standards on labour rights and worker welfare; environmental standards; requirements for record keeping & auditing and traceability among others. The principles of GLOBALGAP include general regulations;

[14] GLOBALGAP is a pre-farm gate standard which covers the process of certified product from farm inputs, the process of production and inspection and the quality of the final products. It is subject to three-year revision cycle to take into account technological and market developments.

critical control points and compliance criteria; provisions for benchmarking and national interpretation guidelines. Before developing a standard, GLOBALGAP evaluates other existing standards to see if there can be mutual cooperation between countries. A number of country governments have joined with private sector producers' associations to create their own countries' GAP standards for fruits and vegetables and have submitted them to GLOBALGAP for certification. Mexico, Chile, Kenya, Japan, some European counties, and New Zealand have all had their local standards certified or provisionally certified by GLOBALGAP.

The British Retail Consortium (BRC) Standard

The BRC Standards are a suite of four industry-leading?? led??? technical standards that specify technical requirements to be met by organizations to facilitate the production, packaging, storage and distribution of safe food and consumer products. Originally developed in response to the needs of UK members of the BRC, the standards have gained usage world-wide and are implemented by growing numbers of retailers and branded manufacturers in the EU, North America and further afield. Certification to a global standard which is achieved through audit by third party certification bodies reassures retailers and branded manufacturers of the capability and competence of the supplier, and reduces the need for retailers and manufacturers to carry out their own audits, thereby reducing the administrative burden on both the supplier and the customer.

Other Private Voluntary Standards Which Producers Have to Meet Include:

Organic Standards – these are specific process standards where certification covers several important areas of agriculture and more recently of aquaculture. There are preliminary conversion requirements that help to ensure that the cultivation medium and the area are reasonably free of contaminants or synthetic agrochemicals. Certification addresses the processes of cultivation, particularly issues of fertilization, crop protection and risks of contamination. Within the EU, it encompasses such standards as EU organic, a standard used to label all organic foods sold in the EU.

Social/Human Rights Standards

Fair Trade – these standards, for socially conscious product labelling, mainly deal with human and worker rights. They guarantee minimum prices considered as fair to producers. They provide a Fair Trade Premium that the producer must invest in projects to enhance its social, economic and environmental development. They strive to create mutually beneficial long term trading relationships. They set clear minimum and developmental criteria and objectives for social, economic and environmental sustainability.

SA8000 – this is a voluntary universal standard that is auditable by a third party and are voluntarily adopted by companies that adhere to specific standards for working conditions and labour rights. SA8000 is based on the principles of international human rights norms as described in International Labour Organisation (ILO) conventions, the United Nations Convention on the Rights of the Child and the Universal Declaration of Human Rights. It measures the performance of companies in eight key areas: child labour, forced labour, health and safety, free association and collective bargaining, discrimination, disciplinary practices, working hours and compensation. SA8000 also provides for a social accountability management system to demonstrate on-going conformance with the standard.

Both the safety and the ethical dimension of food depends to a large extent on production and trade processes. Since buyers cannot monitor directly these processes, private companies and NGOs have developed certification programmes to accompany their standards. Certification allows buyers to verify that the certified supplier complies with the standard through its control by an independent third party. From the foregoing, the typology of standards in the EU can be summarized using the following criterion (see also table 2.1 below)

- Scope – process and product
- Geographical reach- national, regional, global
- Function – social, labour, health and environmental, quality, ethical
- Key drivers – public, private (NGOs, supermarkets) and a mix of public and private
- Forms – management, public codes, labels
- Coverage – generic, sector specific, value chain specific

- Regulatory implications- legally binding, mandatory, voluntary

Table 2.1: Typology of EU Standards

Field of Application	*Form*	*Coverage*	*Key Drivers*	*Certification process*	*Regulatory Implications*
Quality Assurance Environmental Health Labour Social Ethical	Codes of Conduct Label Standards	Firm/Value Chain Specific Sector Specific Generic	Lead Firms International NGOs International Organizations	First Party Second Party Third Party NGOs Government	Mandatory Voluntary Market Competition Requirement

Source: Nadvi & Waltring, 2002

2.3 Theoretical and analytical Framework

2.3.1 Standards and the Trade-development Agenda

The Panacea of Trade Growth and Poverty

Trade growth theories assume that access into global markets and increase in exports will lead to a reduction in poverty. Ricardian theories proposed that trade enables a country to specialise in the production of a commodity in which it has a comparative advantage. However, According to Biggs (2007), the fact that in many cases comparative advantage arises from self-reinforcing externalities rather than as a result of underlying factor advantages is particularly important for developing countries. For the case of Africa, where they have a comparative advantage in primary commodities, this allows for them to specialise in products where they have competitive advantage and which would invariably lead to growth and development. Such has been the assumption with the horticultural sector, which is seen by most as an opportunity especially for small scale farmers to participate in the global market, improve their incomes and subsequently reduce poverty.

Developing countries are more endowed with labour and therefore specialise in production of labour intensive goods (Hillebrand, 1996). This theory was disputed, and a structuralist school of thought emerged in which the basis for sustained integration of the developing countries into the world economy depends on systematic learning, technological competence, external economies and agglomeration advantages (Linemann, 1966:22). These contributions made by the structuralists have undoubtedly advanced the debate on competitive advantage, more recently, theories of innovation and competition state that the most important comparative advantages relevant to development and also to trade enjoyed by countries stem from their ability to: innovate; produce differentiated goods; satisfy differentiated consumer preferences; exploit economies of scale; introduce cost reducing process innovations; rationalise production processes – process innovation and organizational progress and finally use production capacities to compensate for production constraints in other countries. They also recognize that abilities that lead to comparative advantages are unevenly distributed internationally and become unstable over time (Bhagwati and Srinivasan, 2002).

Other economists point out that, in addition to this static gain, freer trade provides domestic firms access to a wide variety of foreign inputs at a lower cost. Furthermore, to the extent that exports help increase the access to foreign capital and technology via the greater availability of foreign exchange, as well as the fact that Foreign Direct Investments (FDI) tends to concentrate in more open economies, expanding exports could lead to higher rates of economic growth and more rapid economic development and by engaging in world trade, developing countries hope to achieve economic growth and ultimately poverty alleviation. However, it has been argued that trade is not a panacea for poverty alleviation and development, but one of the factors that contribute to economic growth though at a modest rate (Polaski, 2005; Rodrik, 2007). Trade creates "winners" and "losers". If the "losers" in the globalization era had been confined to those who have been excluded from global processes, then the policy conclusions would have been clear – enter the global economy as rapidly as possible and take advantage of these economies of specialization (Ibid). However, the "losers" in recent decades include those producers who have participated in the global economy, but who have done so in ineffective

ways. The key challenge thus is not whether to participate in global processes, but how to do so in ways which provide for sustainable income growth. In this regard, export led growth as has been observed in many Asian countries like Hong Kong, Korea, and Taiwan which have achieved remarkable economic growth over the last two decades. This growth has been accompanied by persistent export expansion in these countries (World Bank, 1993). This older trade theory has been strongly criticized for ignoring many important market conditions.

New trade theories, on the other hand, discuss the effects on trade and investment patterns of imperfect competition, economies of scale, and distortions in factor markets. It is particularly interested in explaining how trade and inherent imperfections affect various segments of its participants and how various participants may lose or gain from trading in certain specialised products. These theories also take into account the fact that transaction costs, economies of scale and subsequent agglomeration effects in themselves create winners and losers in a global world trading system (Rodrik, 2007).

Enter Global Standards and its Effects on Trade

While trade liberalization is important for development, the proliferation of standards casts doubt on the beneficial effects of trade. Many authors have pointed out that standards are acting as new non-tariff barriers to trade (Unnevehr, 2000, Wilson and Otsuki 2001). Studies quantifying the impact of standards on trade generally have mixed findings: on the one hand some authors find that an increased stringency of standards will have a negative effect on trade Wilson and Otsuki, 2001; Lacovone 2002; Anders & Caswell 2007). Another set of findings indicate that harmonized or commonly shared standards may increase trade (Moenuius 1999, Czubala, Shepherd and Wilson 2007).

The effect of standards on trade can be summed up using evidence from various studies: Wilson and Otsuki (2001) estimated the trade impact of the "aflatoxin standards" on cereal exports from 4 developing countries and 15 importing countries and found that the standards tend to be significant in most cases and have a disruptive impact on trade quantified in about 670 million US dollars. Otsuki, Wison and Sewadeh in 2001, also estimate trade effects of aflatoxin standards on groundnuts from Africa to Europe between 1989-1998. They further compare the effects when a new European Union aflatoxin regulation standard is

used vs the Codex Alimentarius international standards. According to the study, a 10 per cent increase in aflatoxin standards would result in an 11 per cent reduction in trade, whilst use of a new EU regulation on aflatoxins would result in a decrease in trade by 63 per cent as compared to when the *Codex Alimentarius* standard is applied. Similarly, a study by Lacovone in 2002, estimates the effect of standards on exports of nuts from 21 Latin American countries and 14 EU importing countries. The period covered is between 1990-1998. Results from this study indicate that the EU standard has a negative impact on exports of nuts – a 15 per cent decrease in export volumes.

Harmonization of standards however is seen to have a positive impact on trade as illustrated by several authors. Moenius (1999) finds that shared standards have a positive and significant effect on bilateral trade. He estimates that a 10 per cent increase in the number of shared standards enhances bilateral trade by about 3 per cent. Another study by Czubala, Shepherd and Wilson, 2007, test the hypothesis that EU product standards harmonized with international standards are less restricting to African exports than those that are not harmonized to international standards. The results from this study support the hypothesis that EU standards harmonized with international norms (proxied by ISO standards) exert a less negative impact on African exports than non-harmonized standards. Van Caturen & De Frahan, 2003, also estimated and tested the hypothesis that EU harmonization of food regulation standards increases EU bilateral trade between 12 EU member states trade in the year 1998 in 10 food-sectors; they find that there is a significant and positive effect of harmonization of food regulations. Bilateral exports in sectors subjected to harmonized EU regulations increases intra-EU trade by 253 per cent compared to sectors not subject to harmonized standards.

Evidence from country specific and or/sector specific studies are scarce, however in recent years some studies have been carried out in different countries. Anders & Caswell, 2007, assess the impact of HACCP implementation on US Sea Food imports and find that mandatory HACCP implementation had an overall negative and significant effect on seafood imports to the United States. Import volumes declined by up to -0.34 per cent. Burnquist and Souza (2010) investigated the impact of sanitary and phyto-sanitary regulations on the bilateral trade of goods between Brazil and some of its major trading

partners. According to their results, sanitary and phyto-sanitary regulations restrict commercial flows between the countries evaluated. Another study by Fassarella et al. (2011determines the effect of SPS and TBT measures on Brazilian exports of poultry meat to the main world importers between 1996 and 2009. They found that conformity to assessment-related measures decreased the volume of poultry meat exports from Brazil to its major trade partners, while requirements on quarantine treatment and labelling increased the volume of Brazilian poultry trade.

From the above studies, two main issues can be deduced: that standards can be trade restricting, and the more stringent a standard is, the more trade restricting it is bound to be and that the use of internationally harmonized standards is far less restricting than country/region specific standards.

2.3.2 Global Standards, Governance and Income Distribution in High–Value Chains

Standards are seen as commonly accepted benchmarks that transmit codified information to end users on a product's technical specifications. This is corroborated by several studies (Ruben *et al.* 2007, Laven 2007, Nadvi, 2008). Standards therefore, can extend to customers and end users a basis for attaching credence, or value, to particular claims made about a product's characteristics and specification or the ways in which it has been produced (Nadvi, 2008). As argued in that study, the key policy challenges around the debate on global standards centred on the questions of who sets standards, who monitors standards, what are the costs of non-compliance and what are the governance implications. According to Renard (2003), quality is an endogenous social construct that contributes to coordinate the economic activity of the actors. It can be constructed by two routes: the introduction of collective institutions that establish rules for quality and the means to uphold them or the acknowledgement of forms of local ties among actors that allow them to communicate and negotiate which, in reality often cross (Ouma, 2010). They are thus important for promoting economic efficiency and reducing information related transaction costs (Nadvi, 2008). Standards therefore influence the nature of governance of global value chains because they provide the

potential to codify complex forms of information (Kaplinsky 2006, Tander & Tilburg 2007, Nadvi 2008).

Standards and Governance of Global Value Chains

Value chains are governed when parameters requiring product, process, and logistic qualification are set which have consequences up or down the value chain encompassing bundles of activities, actors, roles, and functions (Kaplinsky & Morris, 2001). Gerreffi et al. 2005 identify three key determinants of value chain governance patterns: (i) the complexity of information and knowledge transfer required to sustain a particular transaction, especially with respect to product and process specifications; (ii) the extent to which this information and knowledge can be codified and, therefore, transmitted efficiently and without transaction-specific investment between the parties to the transaction; and (iii) the capabilities of actual and potential suppliers in relation to the requirements of the transaction.

Kaplinsky and Morris (2001) further argue that governance is important because the intricacy and complexity of trade in the globalization era requires sophisticated forms of coordination, not merely with respect to positioning (who is allocated what role in the value chain) and logistics (when and where intermediate inputs, including services, are shipped along the chain), but also in relation to the integration of components into the design of the final products, and the quality standards with which this integration is achieved. It also requires the monitoring of outcomes, linking the discrete activities between different actors, establishing and managing the relationships between the various actors comprising the links, and organizing the logistics to maintain networks of a national, regional or global nature. It is this role of coordination, and the complementary role of identifying dynamic rent opportunities and apportioning roles to key players, which reflects an important part of the act of governance of value chains, they argue.

Kaplinsky and Morris 2001 distinguish three forms of governance as legislative - i.e. the rules defining the basis of participation in the chain; judicial - the monitoring or auditing of compliance with set rules; and executive - as assistance to value chain participants in meeting the set rules. The same firm or even different firms can perform these three forms in the value chain depending on the type and structure of the

particular chain. Gerreffi and Sturgeon (2003) further identify five coordination structures of value chains as market, modular, relational, captive and hierarchical, all depending on the degree of control by lead firms and the relationships between the various actors. They attribute the mode of governance to a combination of complexity of transactions, ability to codify transactions and the competency of supplier base, the combinations of which result in different coordination structures. Riisgaard et al. (2008) recently suggested a simplification of this typology to include market organization, vertical integration and "contractualization", with the latter referring generally to contracts (explicit or implicit) within or between actors in the chain.

Numerous players characteristically dominate high value chains - often many smallholders or clusters of producers exporting though lead firms. They are very sensitive to health and safety requirements and are faced by many other standards such as labour or ethical; which pose numerous challenges with respect to coordination and monitoring of compliance. For instance food safety and health requirements are covered by HACCP and ISO standards and by the EU's Food safety regulations. In addition, private sector standards such as GlobalGAP, British Retail Consortium (BRC) and the Ethical Trading Initiative (ETI) are also required in order to participate in the chain. These private standards often require compliance at the very lowest level of the chain and producers are often closely monitored, audited and certified by third parties. This in effect means greater coordination by lead firms - which provides another angle to the role of standards in shaping governance of global value chains.

Through the implementation of standards, especially technical product, and process standards, the codifiability of information can be improved and governance of inter-firm ties can move away from relatively more hierarchical forms to more modular or market based interactions which require less co-ordination by lead firms (Nadvi, 2008, Tander & Tilburg, 2007). However, for high value chains like horticulture, this may not hold because of the nature of standards in these chains which require strict monitoring and enforcement by lead firms at the farmer-lead firm level and hence have not shifted entirely to market based interactions but rather a hybrid leaning towards hierarchical forms (Nadvi, 2008).

For instance Dolan & Humphrey, 2004 in a study on the vegetables chain, observe a shift away from company specific standards towards generic social and sectoral codes such as EurepGAP and Ethical Trading Initiative (ETI) as alternative instruments in parameter setting which are then monitored by actors outside the chain and hence supermarkets are less involved in monitoring exporters, effectively shifting their relationships from hierarchy to market types of governance at the exporter-supermarket level. Another study on the South African wine value chain by Ponte, 2009 draws attention to the different forms of governance in three strands of quality of wine – low quality wine as more governed by lead firms and based on quality and price; mid to top quality firms more governed by external actors, mostly industry wine critics' appreciation of quality. This study concludes that chain governance is more based on a normative work where different players in different markets define quality conventions. A more recent study (Tallantoire et al. 2009) on Kenya's horticultural exports industry specifically looked at KenyaGAp and ETI, the authors conclude that the implementation of standards influences horizontal aspects of governance especially the ones related to legislative and judicial governance. Another study by Konefal et al. in 2005 looks at agro-food networks and the rise of private standards. The authors argue that the rise of these private standards and the increasing authority by supermarkets to enforce them have led most agro-food networks to restructure away from market based forms of governance towards hybrid forms leaning more towards hierarchy.

Judging from the preceding analysis of literature, the power of global lead firms to organize and structure value chains has been one of the core elements of the GVC approach (Gereffi, 1999, Humphrey & Schmitz, 2004, Gereffi et al. 2005, Gibbon & Ponte 2005, Altenburg 2006, Nadvi, 2008). These authors recognize that there is asymmetrical power exercised by lead firms whose major task is reducing the costs of organizing these chains, coordinating dispersed and varied suppliers and dealing with concerns such as asset specificity. Lead firms also face the task of specifying quality standards and parameters to chain participants down-stream; and may use tactics to transfer costs of quality control to suppliers and achieve quality control at a distance – mainly achieved through the use of third party certification (Gibbon & Ponte 2005, Nadvi, 2008). This phenomenon, they say, depends on the various

forms of coordination and the mechanisms for transmitting knowledge and information to various actors along the chain. Thus in cases where standards are used to set the parameters that govern the chain, monitoring and enforcement by lead firms is often imperative hence a tendency towards (quasi) hierarchy type of chains with lead firms wielding more power than other chain participants (Tallantoire et al. 2009).

All of this implies that quality is not simply a dimension of competition, but an object of collective understanding and negotiation among major actors in the chain some of whom are more powerful than others (Valceschini & Nicolas, 1995). Power relations are therefore important in defining who and who does not participate in the chain, the setting of rules of inclusion, assisting chain participants to achieve these standards, and monitoring their performance (Kaplinsky & Morris, 2001) and to a large extent the distribution of costs and rents.

A Transaction Cost Perspective of Standards in High-Value Chains and the Distribution of Rent

The costs involved in communicating and enforcing transactions and the *property rights* on which they are based are known as *transaction costs* and these are incurred in order to reduce the risks of loss from transaction failure (Doward et al, 2005). Traditionally, TCE allows for industries to organize as markets, hierarchies or hybrids (Williamson 1985) and standards as already seen in the previous section determine the patterns of these arrangements. Transaction costs in a value chain depend on the structure and governance of the chain. In a market, a transaction is arranged with an anonymous economic agent, usually based on price. The transaction is independent of the parties involved and does not build on other transactions. In a hierarchy, a transaction is arranged with a specific, familiar economic agent. The transaction partner is predetermined and is specific to the parties involved (Aggarwal & Walden, 2005).

With respect to standards in high value chains, transaction costs can materialize before, during and after the transaction itself i.e. the contact phase, the contract phase and the control phase (Den Butter et al. 2007). The contact phase often involves search and information costs and constitute sunk costs; the contract phase consists of negotiating the contract terms - more specifically - spelling out the requirements to be

met in order to fulfil the contract terms; while the control phase involves coasts related to monitoring and enforcement (Ibid). Furthermore, there are also various forms of costs incurred by participants along the value chains that constitute production costs, opportunism costs, search costs and coordination costs which vary depending on the governance structure (Aggarwal & Walden 2005). Standards are said to reduce transaction costs because they are codified and carry information, and therefore reduce information asymmetry and lower costs related to obtaining information (Aggarwal & Walden 2005, Den Butter et al. 2007). Furthermore, when product specifications are standardized and known to trading partners, the bargaining process will cover only the price and conditions of delivery. When the product has not been standardized, bargaining will also be needed with respect to the specifications of the product (Den Butter et al. 2007). Standards can also increase transaction costs especially those related to their establishment and implementation including monitoring and enforcement costs.

Several studies have analysed the effects of standards on transaction costs and how this may act as a barrier to entry. A study by Wilson et al. (2003), revealed that Africa's cereal exports will decline by 4.3% and that of nuts and dried fruits by 11% with a 10% tighter EU standard on contamination levels of aflatoxin in these products. The EU has also estimated the costs of technical standards as being equivalent to a tax of 2% of the value of goods traded (Otsuki et al. 2001). Fixed costs in compliance with standards may affect the decision to export. Maskus et al. 2005 show that the higher setup costs needed to meet strict standards also increase the variability of production costs. Equally, compliance includes not only the cost of meeting the technical requirement but also the cost of verifying that the requirement is met, known as the conformity assessment. This cost represents the largest barrier to trade competitiveness (Lyakurwa, 2007, Sanchez et al. 2006). Chen et al. (2006) find that technical regulations adversely affect a developing country firm's propensity to export. They also reveal that standards and testing procedures impede market entry for exporters, reducing the likelihood of exporting to multiple countries.

Few studies have analysed how transaction costs differ for chain participants. For instance costs of compliance with a certain quality standard may be higher for small producers. This could result from the

fixed cost component of complying with the standard, which would favour larger producers due to economies of scale (World Bank, 2005). However, it could also be due to farm characteristics such as illiteracy of farmers, which makes information and documentation requirements more costly, or illiquidity, which may exclude farmers from the investments necessary to upgrade their farm to comply with the standard (Aloui & Kenny 2005, Jaffee & Henson 2004, Willems et al. 2005)

Standards as Repositories for Rent and How They Influence Distribution of Incomes

Economic rent arises as a result of differential productivity of factors and barriers to entry (scarcity). Makakok (2001) identifies three kinds of rents in value chains which are intra-chain or individual: monopolistic rents result in protected market power; Ricardian rents depending on special resource and Schumpeterian Rents originated in dynamic capability of the firm. Kaplinsky (2000) argues that most economic rent in value chains is dynamic in nature and eroded by forces of competition where producer rent is converted into consumer surplus through competition. Barriers to entry and rent have been identified as important determining factors of rent distribution. Kaplinsky (2000) argues that primary returns in value chains accrue to those parties who are able to protect themselves from competition encapsulated by possession of scarce attributes and involves barriers to entry. Classical economists also argue that economic rent accrues on the basis of unequal ownership or access to control over an existing scarce resource. However, as Schumpeter showed, scarcity can be constructed through purposive action and hence surplus accrues to those who create scarcity (Tullock, 2005). This is essentially what happens in the case of innovations such as standards; because they create greater returns from a product than required to meet the cost of innovation (DFID, 2008).

Standards when viewed as innovations that attract intellectual property rights can be used to create barriers to entry and rent. In a hierarchical system, all resources (codes, procedures and policies) needed to create and implement a standard are produced in-house. The resources so developed become the intellectual property of the firm and can be protected by way of patents (Swinnen et al. 2010). In a hierarchy, the lead firm bears all the cost of research and standards development.

Since internal organizational communication is centralized the decision making, and information dissemination, is fast and inexpensive – which in effect reduces transaction costs in the entire value chain. However, lead firms extract more rent/surplus because of their bargaining power in the chain, which is augmented by their relative positions in the chain (Ibid).

The nature of distribution of economic rent results in different outcomes for different players and this can have serious consequences to developing countries especially in terms of poverty reduction and consequent development. For developing countries, an unbalanced outcome measured by the costs associated with accessing foreign markets vs. returns from sale of goods in foreign markets. This is further exacerbated by the nature of products (mainly agricultural) with little value addition and which in most cases fetch low prices as already discussed in previous sections. Technological divide has also been cited by some authors as reasons for unequal distribution of rent (Grossman & Helpman, 1991). More recently however, some authors like Kaplinsky, 2000 have argued that the problem of falling returns not only afflicts countries but also individual firms especially when they confine their competences to simple and low value adding activities firms fail to insert themselves into global production chains by participating in high value adding activities. The consequence of this failure is immiserizing growth as earlier discussed in a previous section.

Several papers describe examples of small farmers losing market share as a result of the increasing quality standards. Humphrey et al. (2004), describe the redistribution of market shares as a result of quality standards in the fruit and vegetable sector in Kenya. They underline that "own farm production" of downstream actors increased from 40% in 1998 to more than 60% in 2001. All interviewees stated that they had reduced their smallholder supply due to concerns expressed by supermarket buyers about product characteristics and product quality. Other studies (Chemnitz et al. 2007, Okello 2005) find that producers in developing countries especially small farmers have a comparative disadvantage in complying with standards due to high transaction costs and diseconomies of scale; and those that comply with the help of downstream actors are better off and that cost of compliance are greatly reduced for farmers who opt for group certification.

2.3.3 Social Micro-processes of Standards in the New Agricultural Economy of High Value Chains

Smallholder Participation in HVCs in the Context of Standards

Motivation is the force that triggers, energizes, guides and/or sustains behavior (Vallerand & Thill, 1993). There are two major trends in the motivation theory: the theory of characteristic/environment of the job and the equity theories (Roussel, 2000). These theories assume that factors that procure feelings of autonomy, competence and relatedness foster intrinsic motivation (Moumouni *et al.* 2009). The equity theory (Adams, 1963, 1965), suggests that the motivation to work stems from the individual's comparison of his/her situation to those of other people to assess the equity within the organization. Moumouni *et al.* 2009, have developed an alternative explanation framework that could better account for the farmers' motivation. Within this context, their framework suggests that motivation factors could be associated with the context (organizational and financial factors) or with the content (technological factors) of the services offered to farmers by service providers or other intermediaries; services that are seen to enhance their motivation to participate in certain economic activities.

According to Blandon *et al.* 2009, a small scale producer's decision to participate in a value chain is governed by a wide range of factors including access to information on market requirements, credit and the ability to lower transaction costs and minimize risk. These relate to (among other things) the efficacy of input and output markets and related transaction costs, access to land and water, provision of agricultural services. A number of authors have shown the importance of transaction costs in determining farmers' participation in value chains (Holloway *et al.* 2000, Winters *et al.* 2005). Another study carried out in Honduras found that farmer participation in food supply chains is explained by factors related to relative price and transaction costs rather than farm characteristics or other demographics such as age (Blandon *et al.* 2009). Other studies have also shown a positive relationship between farmer participation in value chains with farm characteristics and asset variables (Hernandez *et al.* 2007, Neven *et al.* 2007.

Earlier studies indicate that there are conditions required for smallholders to participate in these value chains: first, the cultivated crop should be suitable for smallholder production ie labour intensive

and the second pre-condition is that they should have access to ancillary services such as information, transport, credit facilities and equipment which are often difficult for them to obtain because of their prevailing low assets and poor financial positions (Glover 1984). Farmers choosing to participate in these value chains often possess some competitive advantages over larger producers in the sense that they can access low cost family labour and have intensive local knowledge (Poulton *et al.* 2005). They have numerous constraints related to market imperfections and high transaction costs (especially those related to quality and standards compliance) (Markelova *et al.* 2009) and may therefore consider the second precondition when choosing to participate in a value chain.

Recently, the use of standards and voluntary codes of conduct in combination with certification schemes have spread significantly in may horticultural value chains (Bitzer *et al.* 2008). With these schemes there has emerged a global audit culture by supermarkets and developed country participants that places emphasis on inspection, measurement, certification and accreditation, which are often costly. These costs are pushed downstream to the producers (including smallholders) and which are often relatively higher for smallholders (Kirsten & Sartouris 2005, Bitzer *et al.* 2008). Hobbs 2003 gives incentives and disincentives of farmers to adopt standards. Incentives include *economic incentives* such as increasing and/or stabilizing revenue, reducing average costs, improved market access, increased capital valuation of farm assets, reduced vulnerability to poor agricultural practices of other farmers; *regulatory or legal incentives which* include changes in ownership rights or tax burdens, liability rules, subsidies; and *human capital incentives* including access to new skills. Disincentives for farmers to adopt standards include *economic disincentives* such as: increased production costs, investment in assets that are specific to one buyer and/or cannot be recovered if the buyer-seller relationship breaks down; *institutional constraints* including inadequate quality monitoring infrastructure, weak or corrupt public institutions that oversee standards, and; *human capital constraints* such as literacy limits on documentation capabilities; constraints on labour or management time, and weak public extension amongst others.

The proliferation of standards and regulations in high value horticultural chains has seen their transformation from spot markets to

more controlled and closely monitored quasi-hierarchical chains as already established in the previous chapter. Dolan & Humphrey in 2001, explain this transition in terms of UK supermarkets' triggering rising entry barriers for exporters. Supermarkets' demands implied that exporters had to invest heavily in post-harvest cold chain facilities, guarantee high and consistent volumes, respond very quickly to orders and assure traceability. In order to do so profitably, implied optimising the economies of scale, both in fixed investments and in monitoring quality. This implied a shift towards vertical integration, which was also favoured to better assure quick a response. In the process, smallholders were replaced by estates (and estate labour), and small exporters by large companies – in some cases very large (Dolan & Humphrey, 2001). These findings have been broadly confirmed by subsequent, more detailed, studies of UK-destined horticulture in Kenya (Jensen 2000) and Tanzania (Jensen 2002). In this regard some degree of vertical coordination is observed in these chains which subsequently affect the modalities for participation of smallholders (Kirsten & Sartouris 2005) in some cases even the reorganization of the support mechanisms.

Market Interventions and Intermediaries for Smallholder Participation in HVCs

Lack of information on prices and technologies, lack of connections to established market actors, distortions or the absence of input and output markets and credit constraints, often make it difficult for small farmers to take advantage of market opportunities (Narrod *et al.* 2009, Markelova *et al.* 2009). High transaction costs faced by smallholders due to their small scale exacerbate these challenges, especially in quality-conscious markets (Poulton *et al.* 2005). Standards also pose coordination problems such as monitoring and enforcement and may be costly for exporters, especially with respect to smallholders largely due to their scale. The problem of coordinating with many small farmers is exacerbated by their geographic dispersion, low educational levels, and poor access to capital and information (Humphrey 2005, Rich & Narrod 2005, Narrod *et al.* 2009).

Due to these coordination problems, there is increasing vertical coordination in many chains as upstream actors such as exporters strive to implement and enforce Quality Management Systems (QMS) in their chains in order to minimize risk. Dries & Swinnen (2004) found that

high standards led to increased vertical coordination in supply chains that is realized in their study area by the emergence of extensive contracting between processing companies and farmers. The rise of contracting, far from leading to the exclusion of poorer farmers, is shown to improve access to credit, technology and quality inputs for poor, small farmers that heretofore were faced with binding liquidity and information constraints due to poorly developed input markets. Minten *et al.* (2009) and Maertens & Swinnen (2009) also found increased vertical coordination in newly emerging supply chains between buyers and poor, small farmers in African countries. The need for increased coordination can also be attributed to the failure of traditional (spot) agricultural markets to deal with this new scenario as the demands for standardized differentiated products cannot be met through spot markets.

Standards as rules, conventions and shared expectations are part of the intermediaries that are used to provide certain ancillary services, for smallholders. The imposition of quality and safety standards led to significant organizational changes, resulting in new forms of collective action that try to minimize the asymmetries in information across principal (exporter) and agent (the farmers). In this regard standard necessitates the role of collective action in solving information asymmetry problems amongst other things. Moreover, the conventional role of collective action, which is the exploitation of economies of scale, also applies with food safety standards: traceability which is central to the system with standards is more economical for both exporters and producers to achieve collectively (Narrod *et al.* 2009). Standards may therefore act as a response to institutional failure, when they correct market failure caused by transaction costs arising from search - locating buyers and sellers; negotiation of quantities and quality; monitoring product quality and enforcing contractual agreements (Hobbs 2003). Subsequently, standards can *lead to introduction of new institutions* to overcome these costs or may even *act as a conduit for information flow* - by improving the flow of information in the supply chain because quality and quantities are readily verifiable and prices are agreed upon in advance, this in turn reduces transaction costs (Narrod *et al.* 2009)

Theoretically, a number of intermediaries for integrating smallholder farmers into the HVC exist. First, smallholder farmers could orient their product to target markets that are less demanding by shifting from the

demanding supermarket chain to the less stringent wholesale chain and domestic markets (Okello *et al.* 2009). Second, smallholders can, through collective action, invest jointly in lumpy/costly assets together hence take advantage of economies of scale and reduce per farmer costs of such investment (Narrod *et al.* 2009). Third, public sector could partner with the private sector to help smallholders overcome the challenges of market requirements by investing on infrastructural requirements that are lumpy or have public good characteristics (training and extension, road, supply of safe water) (Okello *et al.* 2009). This section reviews several institutional mechanisms that have been used to overcome market failure, or achieve economies of scale and their by enhance smallholder inclusion in HVCs with a view to understanding the subtle role of standards.

Contract Farming

The integration of small holders into globalized value chains has been applauded as a key element in increasing their incomes and reducing poverty especially in rural areas. In many developing countries most notably Africa, contract farming is believed to help farmers by providing new technology, ready markets and secured inputs and prices. Furthermore, contract farming offers a mechanism that ensures self-sustained development (Glover 1987, Key & Runsten 1999, Weatherspoon *et al.* 2001).

Eaton and Shepherd (2001) define contract farming as *'an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices'*. The arrangement often 'involves the purchaser in providing a degree of production support through, for example, the supply of inputs and the provision of technical advice'. For this arrangement to work the farmer commits him or herself to *'provide a specific commodity in quantities and at quality standards determined by the purchaser'*. The company on the other hand agrees to 'support the farmer's production and to purchase the commodity'.

There is a wide range of literature on contract farming. Proponents of contract farming outline its positive outcomes such as: it enables risk sharing in production and/or marketing of crops and enhances the access of poor farmers to technology and other inputs and services at lower cost. In addition, they argue that contract farming can improve

the income of small holders, with significant spillover effects in the form of upgrading production technologies (Govereh & Jayne 2003; Key & Runsten 1999, Masakure & Henson 2005). Other contrasting studies have also outlined the dangers of contract farming for small-scale producers (Singh 2002, Watts 1994), arguing that contracts are replete with manipulation of producers and in addition the unequal nature of such relationships can lead to skewed income distribution, pervasive indebtedness and enclave development, among other ills.

An analysis of literature (Kursten & Sartorius 2009) unveils three main types of contracts:

i. Marketing specification contract in which the producer sells the produce to exporter at a specified time, quantity and quality and the producer has full autonomy of the production process (Rehber 1998).
ii. The second type of contract involves some degree of control by the exporter who gives some specifications however the producer sells at an agreed time, quantity, quality and price.
iii. The final type of contract farming is where the exporter has full control of the production process, gives specifications of product and gives inputs and various other support services such as transport at an agreed price.

Strohm & Hoeffler (2006) in their study on contract farming in five HVCs in Kenya find that standards and the obligation to comply with them are a motor for contract farming and induce its diffusion. Their analysis shows that contract farming is driven by:

the nature of perishable products in these chains requiring fast and efficient collection of produce form dispersed and differentiated producers; coupled with the need to closely monitor Quality Management Systems (QMS) making the chain more vertically coordinated; and the need for traceability of produce which means exporters have to procure produce from sources that are known to be complying to standards.

Furthermore, in order to ensure the quality they require, companies often have to provide technical assistance and inputs on credit to meet standards. Therefore, they have to bind the farmers via contracts to sell

the produce to them only so that they do not lose their upfront investments.

Collective Action, Producer Organizations & Intersectoral Partnerships

Vermillion (1999) defines collective action as the coordinated behaviour of groups toward a common interest or purpose. High value chains characterized by quality and safety requirements, traceability and perishability of produce as well as requirements for specialised production usually have high transaction costs which can be offset by collective action in order to achieve economies of scale. According to Narrod *et al.* 2009, the economic rationale for collective action by smallholders derives from two features of markets with food safety standards: (i) economies of scale that are magnified by food safety standards, such as the requirement of traceability, and (ii) the need for specific skills for meeting the standards that smallholders may not have.

Acting collectively, smallholders are in a better position to reduce transaction costs of accessing inputs and outputs, obtain the market information, secure access to new technologies, and tap into high value markets (Stockbridge *et al.*, 2003). In addition, there is evidence that collective action can help smallholders reduce barriers to entry into markets by improving their bargaining power with buyers and intermediaries (Thorp *et al.* 2005, Kherallah *et al.* 2002, Narrod *et al.* 2009). In the majority of cases, larger companies have an advantage in both technical and market sophistication, so they can keep a large share of the value in distant (national or export) markets, even when smallholders participate as illustrated by a number of studies that show how collective action can allow smallholders to tap into HVCs: grapes in India and beans in Kenya (Narrod *et al.* 2009) or vegetables in Central America (Hellin *et al.* 2009).

There are various forms of collective action summarized from literature: some forms are farmer/producer organizations which may exist formally (registered and well organized) or an informal group of farmers located in adjacent areas to one another who come together only to access certain services such as transport, inputs etc. A number of typologies have been developed that distinguish various forms of collective action on the basis of their legal status, function, geographical scope and size (Bijman, 2008). The WDR 2008, for instance, distinguishes three categories of functions: economic services by

commodity-specific organizations, broad interest representation by advocacy groups, and diverse economic and social services by multipurpose organizations. Organizations that provide economic services include cooperatives that process and/or market the products of their members. Multipurpose organizations often combine economic, political and social functions. They provide farm inputs and credit to their members, process and/or market their products, offer community services and carry out advocacy activities (Bijman, 2008).

Collective action can exist in the absence of farmer organizations, which we see as a more formal expression of collective action. Moreover these organizations have their dynamics for instance it is often a challenge to establish collectively agreed rules, to secure members' commitments to abide by the rules, and to monitor and enforce compliance. In some cases, the establishment of farmer organizations incurs transaction costs that imply that farmers may be better off not organizing (Stockbridge *et al.* 2003, Hellin *et al.* 2009). Masakure & Henson 2005 in their study of Zimbabwe found that many local farming groups established to access inputs and/or market outputs disintegrated partly because there was considerable mistrust between farmers. Narrod *et al.* 2009 also find a similar predicament among vegetable growers in Kenya and grape fruit farmers in India that are trying to comply to various standards and therefore access foreign markets.

Producer Organizations (POs)

Producer organizations act as intermediary[15] market organizations that coordinate the exchange of goods and services between farmers and purchasers of their produce. Intermediaries appear on the market if the net gains from trade exceed those obtained through direct exchange. The profit of intermediaries is raised by identifying innovative transactions that either increase gains from trade or reduce transaction costs associated with search, negotiation, communication, computation, contracting, and monitoring the transaction and its partners (Spulber 1999). In this respect, producer groups take the role traditionally

[15] Intermediaries are firms that seek out suppliers, find and encourage purchasers, select buy and sell prices, organize the transactions, keep the records, and hold inventories to supply liquidity or availability of goods and services (Spulber 1999: 3).

fulfilled on the market by middlemen and other traders. Nonetheless, the advantage to producer groups, which puts them in competition with middlemen and traders are the potential savings on transaction costs offered to the farmers associated in producer groups due to horizontal and vertical integration. On the input side, POs improve farmers' access to seeds, fertilizers, and other inputs as well as credit and information at lower cost. A study in Kenya found that lack of credit was the single major constraint limiting the success of producer marketing groups (Shiferaw, *et al.* 2006). On the output side, it can make it possible to combine many farmers' production into larger lots and increase value in the supply chain.

According to Bijman (2008), POs exist at various levels and can range from small village level organizations to regional, national and even international level organizations that are bound together by a common course such as utility principle (where they share similar objectives) or identity principle (they share a similar history and/or geographical space). POs can also take various legal forms ranging from formal to informal. Informal POs are a group of producers that come together to exchange experiences or market information, to receive technical assistance or as a self-help group (Bijman, 2008, Narrod *et al.* 2009). Formal POs include cooperatives, associations and societies that are distinguished by a formal constitution and the legislation that applies. An association is a non-profit organization that enables members to collaborate for services, information exchange and representation. Studies show that legally constituted POs are more sustainable and better protected in terms of liability and can enter legal contracts; they have more bargaining power with exporters and can even access credit through their groups unlike informal groups where contracts are between individual farmers and exporters belonging to the PO (Glover 1984, Bijman 2008). Many POs if properly organized can give smallholders a political voice, enabling them to hold policy makers and implementing agencies accountable by participating in agricultural policy making, monitoring budgets and engaging in policy implementation. Such advocacy organizations, or farmer unions, may lobby local, regional or national policy makers on behalf of their members. Consequently, by reducing transaction costs, strengthening bargaining power and giving smallholders a voice in the policy process,

POs are a fundamental building block of the agriculture for development agenda (Bijman 2008).

A study by Okello *et al.* (2008) on POs in Kenya and Zambia's vegetable chains reveal that through the POs, farmers jointly: invested in fixed assets (e.g., grading and cooling facilities); raised the volume of produce sold (thus attaining economies of scale); reduced the exporters' training, monitoring and coordination costs; hired own technical staff to monitor members' compliance with pesticide residue and hygiene requirements and; implemented traceability system. The POs in return reduced buyers' transaction costs of sourcing from small-scale farmers making it profitable to do so. Under the producer contracts, farmers gained access to essential inputs, technical advice and a ready market. Smallholders received technical information relating to pesticide residue and hygiene requirements, training and field extension services by exporter's field extension officers, and, improved seeds and protective clothing under interlinked credit arrangements.

Intersectoral Partnerships or Pubic Private Partnerships(PPPs)

Partnerships are defined as voluntary and collaborative arrangements between actors from two or more sectors of society that have an institutionalized, yet non-hierarchical structure and strive for a sustainability goal (Glasbergen *et al.,* 2007). Partnerships combine the resources of governments with those of private agents in order to deliver services. Partnerships in high value chains can take various forms; including the provision of services by the governments such as infrastructure, legal environment and policy, and common public goods that may be required by smallholders. The private sector on the other hand may support farmer organizations in order to access sustainable quantities or acceptable quality of products. However, questions arise regarding equity and the distribution of benefits. Contract farming is, perhaps, the most common form that private sector uses in providing certain services. More recently development agencies are also seen to play a pivotal role for some specific sectors in the Aid for trade programs (Otieno & Knorringa, 2012).

In a study by Hellin *et al.* both the private and public sectors are found to have key roles to play in contributing to agricultural development. Governments are of central importance in determining how markets should function, especially in creating an enabling policy

environment. Governments can help ensure that the legal and judicial system supports low-cost contract enforcement, facilitate the flow of market information, and make transport, electricity, water and other infrastructure systems widely available to help support smallholders. More recently the structural adjustment programs and trade liberalization policies in the 1980's an 90's saw the withdrawal of government support from many agricultural sectors and hence roles that were traditionally played by the public sector (for example, extension services) were transferred, or shared with, the private sector.

The role of NGOs and International donors has also evolved in recent years. Narrod *et* al. 2009 in a study of Kenya's green beans sector found partnerships between the government and donors in providing funds for training service provides in the horticulture sector, these service providers in turn provide services to smallholders and their respective groups. Some NGOs had also partnered with private firms to train, audit and/ or provide financial aid for small-scale green bean farmers seeking to obtain certification.

There are some instances where inter-sectoral partnerships have been used to organize farmers, often the process is instigated by outside agents such as government and NGOs, or sometimes by the private sector (e.g. dedicated wholesalers) (Hillen *et al.* 2009). Narrod *et al.* also found that governments, exporters, NGOs and donors facilitated formation of some smallholder organizations. For example, the Government of Kenya, in partnership with the Japan International Cooperation Agency (JICA), established a fresh produce handling company, which mobilizes and recruits smallholders to form farmer groups. However some authors argue that where farmer organizations established with government or NGO support encounter financial difficulties, there is often a tendency to provide further assistance, thus externalizing some of the organization's costs (Berdegué, 2001). This partly isolates the farmer organization from its market context and may begin a vicious circle requiring more and more subsidies.

Sustainability of Smallholder Participation in HVCs

Economic sustainability of smallholder participation in high-value chains is when the farmers can continue to produce for the global market indefinitely; production for HVCs must be sufficiently attractive for smallholders to remain in the chains on a long-term basis. Participation on a long term basis will hence depend on a number of things: the risk reward factors for participating in this market rather than the local market; their competitiveness and ability to overcome production, financial and other related constraints; and the way the market is maintained in terms of its structure and related standards so as to avoid exclusion of smallholders.

As seen from the previous chapter, global value chains have undergone various transformations with more consolidated retail power, and quality based competition, which have significantly transformed how the global agri-food system operates and the role of smallholders in this system. Secondly, in these globalized chains, power has shifted in favour of retailers vis á vis producers (Lee et al, 2010), as such the rules of engagement are set by retailers and this in itself can determine whether smallholders become excluded or not.

Maartens & Swinnen's (2006) extensive study of the impacts of standards on green bean producers in Senegal found that despite increasingly strong EU food standards Senegal's exports to the EU had grown sharply over the previous decade. They found that tightening standards had induced structural changes in the supply chain, including a shift from smallholder contract farmers to large-scale integrated estate production. Participation in contract farming was increasingly biased towards households with more land and labour. Poorer producers were able to participate as wage labourers and gain significant benefits compared to those not participating in formalized markets and value chains. (Maartens & Swinnen, 2006).

Another study by Graffham *et al.* (2009) found that export markets may exclude smallholders through new buyer standards, according to the study 10 exporters controlled over 50 per cent of the Kenyan export horticulture market. The survey found a 60 per cent drop in formal participation of small-scale growers in these companies' supplier networks between 2005 and 2009. The authors suggest that the primary

reason for this decline is financial, rather than technical. GLOBALGAP certification requires far more capital than many small-scale farmers can afford on their own (Graffham *et al.* 2009). In another study (Donovan 2010) exploring the effects of certifications in the Nicaraguan coffee market found that producers starting with relatively high levels of assets (natural, financial and human capital) received significantly positive benefits from organic certification. These producers made up a minority (20 per cent) of the sample group and were relatively well endowed with: natural capital (more than 10 *manzanas* - about 7 hectares) in coffee production), financial capital (income and access to larger credit for investing in fertilizer and labor), and human capital (ability to experiment and learn for increased productivity). Producers starting with lower asset endowments benefited only marginally from participation in organic certification vegetable producers.

Poor households may not be able to participate in or benefit from participation in value chains unless they have access to and the ability to use (and accumulate) certain assets effectively (McKay 2009). Assets may be substitutable and it may be possible to design interventions to compensate for weak or non-existent assets. Unorganized farmers can benefit significantly from contract farming schemes (Gibbon *et al.* 2009; Minten *et al.* 2005). Value chain interventions often offer a range of ancillary benefits and services that build human and natural capital (Seville et al, 2003) and these interventions may go a long way in ensuring sustainability of smallholder participation in HVCs.

2.3.4 Contextualizing Institutions in the Standards Debate

Institutional dynamics in this study are analysed at the various levels of analysis from the lens of "new institutional economics" and "market failure". Institutions are rules, enforcement mechanisms, and organizations (World Development Report, 2002). Institutions are the rules, including behavioural norms, by which agents interact - and the organizations that implement rules and codes of conduct to achieve desired outcomes (North, 1990). Institutions are often considered as exogenous and the problem becomes of "getting prices right"; while this is necessary to address market failure it is not enough to achieve complete markets. In recent years, some authors (notably Rodrik, 2007) have contributed significantly to this debate by stating that institutions

are needed because markets are not self-regulating, self-stabilizing and self-legitimizing and that the market economy is "embedded in a set of non-market institutions. Rodrik further argues that non-market institutions may however provide outcomes that are undesirable i.e. outcomes that restrict free play of market forces in pursuit of a larger goal such as stability and cohesiveness.

Institutional change is thus explained in terms of responses of powerful groups to changes in relative prices, technologies and transaction costs. These groups respond by modifying institutions in ways that they perceive to be in their interests and in different countries the same sets of changes in relative prices and in transaction technology may stimulate radically different types of institutional change (Doward et al, 2003). Institutional change can take a broad 'anti-development' form (structuring transactions to create rents), or a 'pro-development' form (structuring transactions to reduce costs and thus promote trade and investment). Institutions, such as written contracts, charters, constitutions, laws, and even unwritten norms and codes of behaviour are devised to reduce information uncertainty and transaction costs.

New Institutional Economics (NIE) thus focuses on the interaction between legal (formal and informal) institutions and economic behaviour. Both directions of causality concern researchers in the field: how institutions influence economic behaviour and how economic factors affect institutional change. As such, the NIE abandons standard neoclassical economics assumptions that individuals have perfect information about the market and important current or future events, as well as the assumption that transaction costs of exchange are zero (North 1990, pp. 27–35; Williamson 1985, pp. 24–7). As a result, NIE introduces observed organization and information costs to neoclassical analysis, thereby providing more analytical richness and power for examining empirical activities (Leonard, 2003) in the three levels of analysis described above.

Josling *et al.* (2004), suggest that standards in the food and agricultural sector can be classified under two broad categories: (i) provision of public goods such as control of pesticide use in agricultural production; and (ii) reduction of transactions costs associated with information asymmetries between producers and consumers concerning food product characteristics, e.g., the extent of pesticide residues in a product which consumers are unable to ascertain either before or after

its consumption. In the context of this study therefore, institutions are necessary for the enforcement of standards - rules and regulations as well as preventing market failure by providing means of mitigating transactional cost aspects of standards. Davis and North (1971) identify two major influences on transaction costs and on the risks of transaction failure: the ***institutional environment***, and ***institutional arrangements***.

> *'Institutional arrangements' are the forms of contract or arrangement that are set up for particular transactions.*
>
> *"The institutional environment (sometimes known as the institutional framework) is the broader set of institutions (or 'rules of the game') within which people and organizations develop and implement specific institutional arrangements or requirements for the market such as standards".*

The Institutional Environment for Standards

According to the theory of optimal intervention market distortions should be targeted at source (Bhagwati, 1984), however, they may also provide protection for domestic producers and are, therefore, subject to "regulatory capture" (Roberts, 1999; Fischer and Serra, 2000; Sturm, 2006; Essaji, 2008; Swinnen and Vandemoortele, 2009). Given the potential for standards and technical regulations to distort international trade, a key outcome of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994 was the securing of multilateral disciplines on their use through the WTO's Agreement on the Application of Sanitary and Phytosanitary Measures (SPS), and the revised Agreement on Technical Barriers to Trade (TBT).

The objective of these agreements is to ensure that standards and technical regulations, while potentially meeting legitimate economic objectives, are not disguised restrictions on international trade. As signatories of the WTO, governments are obliged to implement SPS and TBT requirements through the introduction of legislation (Otieno & Ogalo, 2009). Requirements also stipulate that all signatories of the WTO implement these agreements by institutionalizing and regulating safety and health requirements by setting up inspection, monitoring and legislation institutions such as – National Enquiry Points (NEPs) and other standards bodies through which notifications take place. Moreover, developing countries are seen as "standard takers" rather than "standard makers" because they lack the capacity – both technical

and financial, to develop their own standards and most often have to adopt the standards set by their counterparts in the export markets (ibid) and hence abide by the rules and regulations in those export markets even if it means changing their own rules.

Some of the important assumptions made in this framework are that markets are perfectly competitive and that economic agents behave "rationally" in maximizing firms' profit or consumers' utility. In real life, firms must make the decision to enter or expand in markets with a different language, preferences, and business practices, where information on local markets conditions and reputations may be imperfect, and where foreign regulations and laws may be different than those applicable in the home market, or poorly enforced. Before a firm decides to engage in trade, it must invest in information. And before it enters a foreign market, it will probably also need to invest in technology. Firms may need to expand their production, and are likely to need to adapt their products to be competitive in global markets. The firm's decision to invest in information and technology will be influenced by its expectations regarding the security of property rights and contract enforcement in both home and foreign markets – all of which depend on institutions. These types of institutions are *enforcing and regulating* by nature.

Therefore as noted above, standards are often justified as a means of solving specific market failures such as externalities. However, it is typically claimed that developing countries are hampered in their ability to meet such standards due to a lack of the necessary human capital and poor governance and institutional failures (Wilson & Abiola, 2003; Maskus and Wilson, 2001; Essaji, 2008).

The Institutional Arrangements and Standards

The linkage between institutional change and economic development using these concepts is that low income economies are characterized by high transaction costs and risks, weak information flows, and a weak institutional environment (WDR, 2002). Actors, particularly those with little in the way of financial and social resources or political leverage, then face high (all too often prohibitive) costs in accessing information and in enforcing property rights. These costs inhibit both market development and access to existing markets, in turn inhibiting economic and technological development. Low levels of economic activity can

themselves lead to thin markets, inadequate co-ordination, high transaction costs and risks, and high unit costs for infrastructural development. The result can easily be a 'low level equilibrium trap'.

In the framework of new institutional economics, the transaction is the basic unit of analysis. Williamson (1993) describes transactions as the transfer of a good or service across a technologically separable interface. One stage of activity ends and another begins. Standards involve transactions and incur transaction costs in the process of their compliance. Transaction costs can be direct or indirect. And as already described above, incurred during contact phase - search and information costs; contract phase – monitoring and enforcement; and compliance phase – direct costs of compliance such as upgrading, certification and accreditation. Furthermore as already discussed in previous sections, these standards are dynamic over time and are constantly being revised by supermarkets and retailers. Consequently producers and exporters in developing countries are also continuously putting measures in place in order to meet these standards and incurring costs in the process.

In view of this, standards can significantly raise setup and production costs and act as impediments to competition by blocking firm entry and expansion within a country or even act as barriers to trade (Fischer &Sierra 2000, Maskus et al 2005); this is particularly more severe for African producers and exporters as they may be 'traded down' the markets (Gibbon and Ponte, 2005). However, some authors argue that at firm level, production of goods subject to recognized standards could achieve economies of scale and reduce overall costs. A reduction in overall costs may occur as a result of an increasing the transparency of product information (Maskus et al. 2005, Henson et al. 2009) or by using institutional arrangements and market intermediaries that reduce transaction costs (Narrod et al, 2009, Markelova et al, 2009).

In this case two "types" of institutions and institutional arrangements emerge – *enforcement institutions* that monitor contracts and ensure compliance eg certification and accreditation institutions. The second types of institutions are *facilitating institutions* – whose function is to mitigate transaction costs related to contact and compliance such as market intermediaries – producer organizations, collective action institutions and other innovative arrangements to achieve economies of scale. Within the context of this research, an analysis of the dynamics of

standards in Kenya's horticultural sector is set to reveal different institutional dynamics within the sector.

2.4 Summary of the Analytical Framework

The analytical framework for this study takes cognisance of the dynamics of trade standards in a globalising world. It is based on the link between standards and development drawn from various perspectives of Kenya's horticulture sector. Various aspects of development are discussed here and each of these aspects backed by a theoretical underpinning. It comprises of four main elements (1) the scope and context of standards and subsequent institutional dynamics (2) the macro economy of standards and its impact on exports (3) standards, governance and the resultant distributional effects (4) the social –micro processes of compliance with standards and sustainability of smallholder participation. Each of the elements and their theoretical grounding and approach for analysis discussed in this section. In addition, each of these elements presents institutional dynamics that are discussed further in the concluding chapter.

The analytical framework (figure 2.1), begins with the assumption that trade and openness stimulate exports, however a country's ability to export is determined by internal and external factors. Major constraints and challenges of the external environment could continue to restrict the growth of the export sector. Some of these include increased use of Non-Tariff Barriers (NTBs) such as standards. In this study, standards are seen as a factor of the external environment number. Other factors on the internal environment could also restrict export growth, these include trade facilitation mechanisms; poor infrastructure; inadequate capacity to comply and domesticate international obligations; multiple membership in trade pacts; narrow export basket; high taxes and inadequate supply capacity exacerbated by low capacity utilization in the exporting sector.

Trade costs, which include international transportation costs, transaction costs e.g. related to meeting standards and regulations, are an important barrier to trade (Balat et al, 2008). Estimates from Anderson & van Wincoop (2004) and Hummels (1998) indicate that these costs can in fact be much larger than tariffs and other trade policy barriers. Even in places where formal trade barriers are almost fully eliminated, trade costs still remain as strong barriers to exports and

imports and prevent the full realization of the gains from trade thus diluting positive effects of competitive advantage (Balat et al, 2008). In developing countries, these costs can also reduce the poverty alleviation role of export opportunities (Gioe, 2007. It is within this backdrop that the macro-level effects of standards on exports in the horticulture sector are studied while taking into consideration other demand and supply side constraints that affect horticultural exports trade.

Looking at the global value chain, market imperfections and other factors (including standards) may lead to high costs of transactions and reduce competitive advantage for some chain actors (Balat et al, 2008). In this regard, competitive advantage theory and economies of scale are used to unveil the effects of standards on various types actors along the value chain and the distributional outcomes related to compliance. In achieving competitive advantage, it is very important to minimize trade/transaction costs. Humphrey (2006) argues that some horticultural products are attractive for small farmers because there are few economies of scale in their production and small farmers may have a competitive advantage in labour-intensive products that do not have economies of scale because of their ability to call upon family labour. Small farms' competitive advantages over large commercial farms lie principally in their low transaction costs in accessing and supervising motivated family labour and in their intensive local knowledge, but their small scale leads to high unit transaction costs in almost all non-labour transactions (in accessing capital, market and technical information, inputs and output markets, and in providing product traceability and quality assurance) (IFAD 2001). Globalization and trade has different outcomes for different actors along the exports chain, this is because different economic actors interact in different ways so as to maximize profits and minimize costs and in doing so, some loose and some gain. Therefore at the value chain-level, they may have different distributional outcomes resulting from power asymmetries and exclusionary tendencies.

Finally given the costs related to meeting standards, smallholders often strategize and co-operate through producer organizations to mitigate these costs. In our case, farmers choose production bundles so as to maximize profits 'and minimize costs at some specified set of prices for their products. Therefore at the micro-level, we analyse two main aspects: the smallholders' decision to comply/not to comply with

standards and therefore participate in the export chain as well as their strategic cooperative behaviour through different market intermediaries. A basic assumption underlying this analysis is that farmers engage in collective action via producer organizations and other market intermediaries because there are efficiencies in certain joint, as opposed to individual, actions.

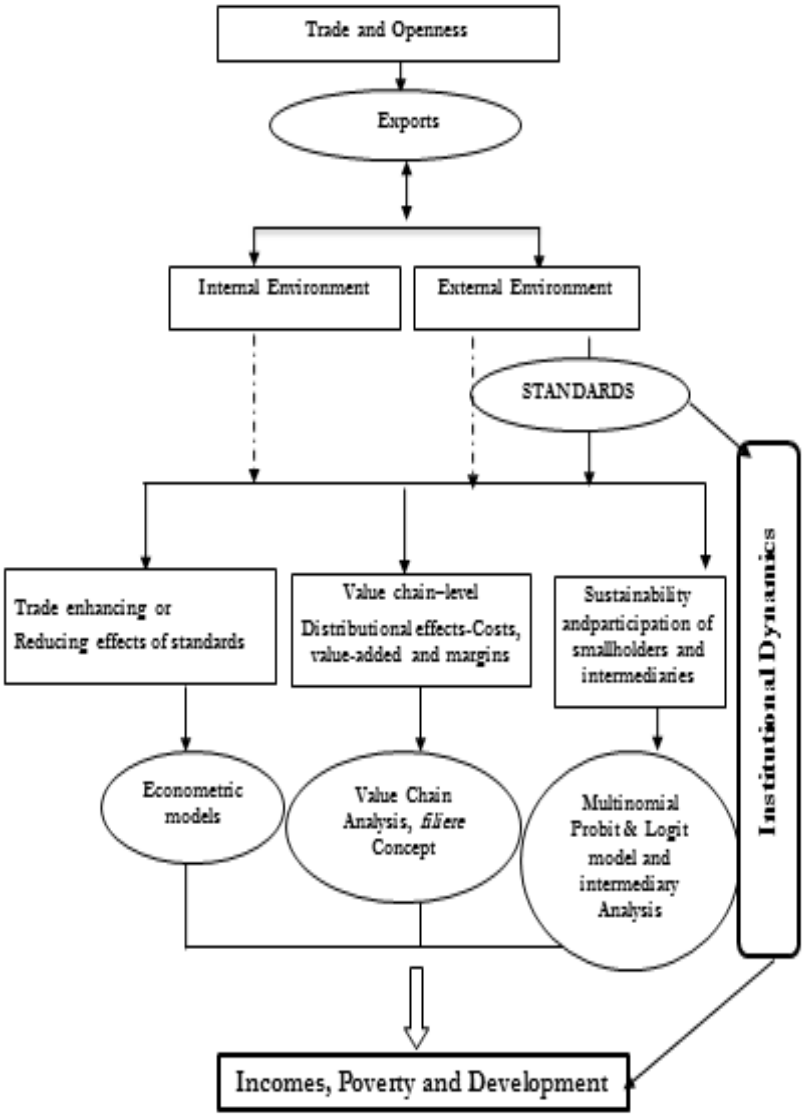
By using empirical work and multiple theoretical inferences described above as well as quantitative and qualitative methods[16], the study will give various perspectives of the effect of standards on development. Based on the argument that trade is good for growth and for promoting exports especially in developing countries (specifically in areas where they have comparative advantage). At the same time, by complying to standards, farmers are able to access niche markets but various factors (including standards) and other market imperfections may lead to high transaction costs and may affect competitiveness of a sector thereby negating the benefits that would accrue in terms of export flows. Standards also enable transfer of technology and innovation to producers thereby enabling them to participate in global markets and earn incomes. Benefits accrued from trade, and compliance to standards are not shared equally among various actors and the introduction of standards and the inherent "difficulties" related to meeting them may affect farmers' decision to participate in the export chain or use certain intermediaries for their participation.

This study is aimed at understanding the effects of standards on Kenyan horticultural exports i.e. trade flows, while at the same time recognizing that at sector level and through value chains, many market imperfections – such as standards, infrastructure, information costs, costs of inputs and agglomeration economies among others may play a role in increasing/reducing transaction costs thereby impacting negatively/positively on competitiveness of the sector and subsequently affecting exports. Further to this, the participation of small-scale farmers and supporting institutions is crucial in improving their access to global markets and hence it is assumed that if they would comply to standards they would benefit from trade, however it is also emerging that the governance of global chains may also affect the power relations

[16] The methods applied for the different levels of analysis will be captured in each of the chapters.

and hence the distributional outcomes for various interest groups. A final question in this study is the dynamics of smallholder participation in these markets under the prevailing circumstances and how market intermediaries facilitate their participation. This study will attempt to offer an explanation of this phenomenon by exploring the connection between standards and various aspects of trade and exports i.e. unveiling the nexus (Fig 2.2).

Figure 2.2: Analytical Framework



2.5 Conclusion

This chapter contextualized the standards-development debate by presenting the typology of standards, their processes of compliance and global level dynamics. The development and proliferation of standards stems from consumer demands for safety health and ethical accountability in the production and processing of exports to developed countries and therefore developing countries are seen as "*standard takers*" having to comply with these standards in order to access these markets. In addition standards are dynamic over time and purpose – i.e mandatory vs. voluntary requiring certification and accreditation as '*due diligence'* falls on the producers. This not only raises transaction costs but also shapes the governance of the entire global value chain; the legal, regulatory and institutional environment; and provides opportunities for technology transfer and upgrading.

The debate linking standards and development is then elaborated in three main contexts. *First*, the argument behind trade growth and development, where the hypothesis that standards act as *"barriers"* to trade rather than *"catalysts"* is analysed in the context of effects of standards on horticultural export volumes or value in relative terms. The *second* argument is that standards influence the nature of global governance of value chains and subsequently shape the power relations and rent seeking behaviour. In this view two main theoretical and analytical elements emerge: a value chain approach used to provide an analytical framework for the value chain elements, its governance and subsequent power relations that influence distribution of rents. The second element is the transaction cost economics concept which provides a theoretical rational for the analysis of distribution of costs and benefits related to standards along the value chain. The *third* argument presents an analytical framework for the micro level dynamics of compliance to standards sustainability issues. Here the approach uses motivation theories to analyse the decision to participate based on socio-economic factors and institutional constraints. It also looks at how intermediaries are used to overcome these constraints and the sustainability of smallholder participation in high value chains.

The *fourth* element is the institutional perspective of standards. NIE discussed here gives the dynamics of institutional environments vs.

institutional arrangements and intermediaries for standards. The analysis of institutions here presents first and foremost, how standards shape the institutional environment for their adoption and regulation mostly through the legal and regulatory requirements. From an institutional perspective, we also look at how standards shape the governance of value chains and related constraints, and the institutional modalities used to overcome these constraints and ensure sustainability of exports.

In this study various theories will provide a foundation for analysing the effects standards on Kenya's horticultural sector. In its basic form, the economic theory suggests that gains from trade arise when countries specialise in production of those goods to which they are best suited, thereby earning export income that allows for poverty reduction and subsequent development.

3 Standards and Development in the Context of Kenya's Horticulture Sector

3.1 Introduction

In the past two decades, the global development and proliferation of standards as a pre-requisite for market access has led to several changes within the export sector in most developing countries. Standards are developed by developed country retailers and 'pushed' downstream to developing country exporters. This creates a series of global-local interaction processes over time and these impacts not only on local level production but also on the micro-level processes of innovation and knowledge dynamics. Furthermore, in order to ensure that these standards are complied with, the process of localizing and adopting them further leads not only to innovative organization of producers but also the creation and/or enhancement of institutions which conceptually builds on neo-institutional approaches. The development of standards –both public and private, have led to changes in the structure and governance of global value chains (Gereffi *et al.*, 2005) leading to more vertically integrated of hierarchical chains with close control and monitoring of compliance (Gereffi & Sturgeon, 2003), all these lead to different dynamics of power relationships and distribution of costs and value added.

This chapter analyses the landscape and typology of standards in Kenya's horticulture sector. The subsequent sections below give an overview of the global to local map of standards in Kenya's horticulture sector with a view to establishing their dynamics, processes of certification, localization and adoption and consequently their implications on value chain structures, transaction costs and institutional and technical capacity and development. It describes the horticulture sector in Kenya while contextualizing it within the

standards-trade-development debate. Three main issues are discussed in this chapter: the historical context of the horticulture sector production and development; the value chains, standard chains and processes for compliance; and the institutional context of standards in Kenya's horticulture sector.

Data and Methodology:

Data used in this section is obtained from two main sources: secondary data sources include HCDA data on exports. Primary data sources are mainly from key informant interviews of persons from standards related bodies and government and semi-government institutions, NGOs, international development organizations, producer organizations, financial institutions and certification bodies. This was also augmented with FGDs conducted with farmers in various districts (Appendix 3.1). The key informant surveys were conducted using semi-structured questions (Appendix 1.2) and additional information was also obtained from publications such as economic surveys, institutional websites and institutional newsletters and publications. The information collected from key informants was analysed and follow up meetings with producer organizations to verify information was also done.

3.2 Kenya's Horticulture Sector and Related Standards

3.2.1 Horticulture Sector in Kenya: Production and Development

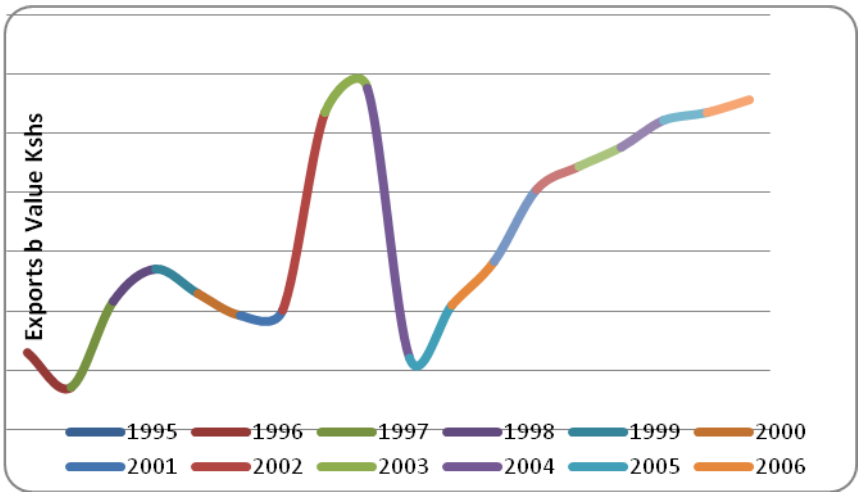
Sector structure and key players

Large-scale horticultural production in Kenya started during World War II to supply food to the Allied Forces stationed in East Africa. Since then, Kenya's horticultural industry exports, despite being a latecomer in the global market, have rapidly caught up with the market leaders (Jaffee 1995). At the time of independence in 1963, horticultural products accounted for only 0.3 per cent of total export value, but from the late 1960s, exports expanded both in volume and in the diversity of crops (Jaffee 1995; McCulloch & Ota, 2002). Between 1963 and 1991, horticultural exports from Kenya rose by approximately twelve times in terms of tonnage and by forty times in terms of value (Jaffee 1995) reaching approximately US$ 167 million by the year 2000. This signifies

an annual growth rate of about 6 per cent per year. By the late 1990s, Kenya supplied some 75 horticultural products to overseas markets not only as raw products but also as pre-packed and pre-prepared vegetables (Jaffee 1995; Dolan & Humphrey 2000).

Today, horticulture is the fastest growing agricultural sub-sector in Kenya, contributing close to 3.5 per cent of the GDP, and 13 per cent of the agricultural GDP, it is the second biggest foreign exchange earner after tourism. Furthermore, the sector supports about 50,000 smallholders and at least 85,000 workers. Horticultural products have accounted for two-thirds of all growth in agricultural exports and recently surpassed coffee to become the second largest merchandise export, after tea. Kenya is the second largest horticultural exporter in Sub-Saharan Africa (after South Africa), the second largest developing-country exporter of flowers in the world (after Colombia), and the second largest developing-country supplier of vegetables to the European Union (after Morocco) (Figure 3.1). Moreover, the value of horticultural exports has shown an upward trend since 1995 (Figure 3.1), there was a dip in 1997 followed by a slow but steady rise till 2012.

Figure 3.1: Kenya's Horticultural Exports 1995-2012



Source: HCDA Data

Overall, the sector directly supports about half a million workers, small farmers and families in production and another 1.5 million

labourers in exporting or value addition. There are between 80,000 smallholder exporters with small farms ranging from 0.5 of an acre to 5 acres, about 200 medium scale farmers with farms sizes ranging between 5-50 acres and about 20 large scale farmers with farms over 50-5000 acres. The sector also comprises of about 10 integrated large scale exporters, and about 20 briefcase exporters (Table 3.1). Producer organizations form an integral part of the horticultural production and comprise of members ranging between 15 and 250 and who have common interests, i.e accessing the export markets. There are over 300 such groups spread out all over the horticultural production regions. The groups are self-managed and registration is required for the group to be considered eligible for a contract with an exporter. POs can also receive group certification and the group can also provide collateral in case one of the members needs to access credit.

Table 3.1: Horticulture Sector Producers and Exporters in Kenya

Type of producer	Numbers (approximate)	Farm size (acres)
Smallholders	80,000	0-5
Medium scale producers	250	5-50
Medium scale producers with integrated pack houses for export	158	5-50
Brief case exporters (own pack houses but not farms)	22	0
Large scale integrated farms	20	50,000
Labourers in production and exporting	2 million	N/A
Producer organizations	Over 300	N/A

Source: HCDA estimates, 2009

In Kenya today, export horticulture represents an opportunity for reducing poverty through income generation among smallholders, rural labourers on larger farms, and unskilled or semi-skilled processing factory workers. No reliable figures are available, in part because it is difficult to separate the export segment from the much larger, domestically oriented business. However, if we conservatively assume that each farmer or labourer supports on average at least three to four other persons, then the industry supports roughly 2 million Kenyans.

There are various factors being seen to contribute to the success of the sector: competitive supply chain (off-season producer), vibrant private sector (including associations such as KFC and FPEAK), "light" regulation and taxation, support by KEPHIS, existence of Task Force, etc. Growth opportunities exist for further export of fruit and vegetables, currently only a small share is exported to the EU market while the US market remains almost unexplored; there are also opportunities for value addition, for instance, in producing semi-prepared and ready-to-eat combinations. In the region, Kenyan horticulture sector faces increasing competition from other African countries such as Ethiopia, Zimbabwe and Rwanda putting pressure on profit margins.

The EU is still the most important market for Kenyan horticultural products. Exports of Fresh Fruits and Vegetables (FFVs) and cut flowers to the EU accounted for about 80 per cent of total exports of FFVs and cut flowers from Kenya the rest 20 per cent is mainly to the Middle East – United Arab Emirates and Dubai. All consignments of fresh fruits and vegetables to the EU must meet the EU directive1148/2001 where a certificate of conformity must be issued to all consignments and all products are subject to EU market requirements. In addition the shift to systems certification which is mandatory; both private and public companies are required to demonstrate their credibility by adapting to ISO 9001 for quality management systems and ISO 22000 for safety and health to improve quality and efficiency. These standards and regulations therefore cut across both public mandatory and private market requirements making the landscape of standards complicated especially for smallholders.

3.2.2 The Evolution of Standards in Kenya's Horticulture Sector

In order to participate in global markets and realize gains from trade, Kenya had to develop the capacity to meet regulations and market requirements. Thus the proliferation of standards led to the development of local institutional and technical capacity at various levels of government, private sector and smallholders. These institutional and capacity changes are essential for the adoption, domestication and upgrading of production chains; all of which

improve market access and may stimulate exports and generally growth and development.

Since the 1990s, there has been a more tightly integrated value chain especially with the European Union due to a number of factors. First, over the last two decades, many retail chains in Europe have undergone major consolidation, expanding in size and market share and thus exercising substantial influence on value chains across a wide range of products including horticulture from Kenya. Second, the proliferation of mandatory and voluntary standards such as the MRLs has changed the value chain. At the same time, there has been a growing NGO and consumer concerns regarding the ethical implications of global value chains In order to access the EU market, all horticultural exporters are required to implement a number of standards in production systems and put in place auditing processes to ensure compliance.

Standards in the EU are both complex and dynamic, incorporating features that go beyond simple quality, to less apparent characteristics of *product safety, environmental management, and human rights*. This is driven by the philosophy of the Triple Bottom Line, which integrates profitability with continual improvement in environmental and social performance in everyday business practices. Standards in Kenya's horticulture sector have also involved in line with EU standards. Since Kenya joined WTO in 1995, it became mandatory to meet SPS and TBT requirements as stated by the WTO. Then came the emergence of *EU regulatory framework* and a consortium of *EU private supermarket standards* which have shaped the evolution of standards in the sector in Kenya (Table 3.2)

Table 3.2: Evolution of Standards in Kenya's Horticultural Exports Sector

Year	Code of Practice and Content
1995	Kenya Ascends to the WTO and has to comply with SPS, HACCP and Codex Alimentatius Standards
1997	FPEAK Develops the first local code of conduct based on WTO requirements for all producers Also known as KS 1758 code of practice
1997	17 major European supermarkets form a group and develop a code called EUREP-GAP (European Retailers Protocol for Good Agricultural Practice). This covers not only food safety and health requirements, but also ethical practices such as worker welfare and environmental issues. Whereas the SPS agreement requires 'equivalence of risk outcome'[17], EUREP-GAP requires 'equivalence of system'[18].
1999	-EUREP-GAP comes into effect and FPEAK develops a second code of Practice based on EUREPGAP requirements. This is code is meant to insure internal audit of exporters -About 1600 Producers and exporters lose their contracts due to failure to comply with new EU regulations.
2001	-Emergence of Ethical Issues - Ethical Trade Initiative (ETI), Maxhaavelor, Fair Trade Initiative and Flower Label Programme (FLP). This meant increased costs of compliance to producers and many smallholders were affected by these new developments. -First pilot certification on EUREP-GAP initiated by the FPEAK in Kenya.
2002	-Emergence of the International Food Safety Initiative(IFS) - by France and Germany, an equivalent of UK's British, Retail Consortium (BRC) -EU retail outlets[19] take more active role in pushing for compliance. -EUREP-Gap Introduces a bench marking concept
2004	-FPEAK revises code of practice with National Interpretation guidelines and for small scale holders and re-names it KENYA -GAP in the first attempts towards harmonization with EUREPGAP standard -Exports increase by 14 per cent after this move

Source: Author's compilation

3.2.3 Mapping the Horticulture Exports Value and Standards Chain

Horticulture Sector Value Chain

The horticultural value chain in Kenya consists of many players, small-scale farmers (approximately 140,000 in number); middlemen and brokers; large-scale farmers; exporters – both small and large; lead firms and some major multinational firms mainly exporting to the EU. Recent developments have also seen the emergence of other institutions such as cooperatives and producer groups that also participate in the chain.

Key characteristics of the chain are derived from results of the survey carried out in 2009. These indicate that the structure of the supply chain comprises of a large number of smallholders with farm sizes ranging between 0.25 -5 acres either producing individually or through producer organizations having contractual arrangements with exporters. It is also evident that most farmers' export just over 50 per cent of what they produce with the rest being sold in the local markets or being consumed at home. The main players in the supply chain are middlemen and exporters, middlemen continue to play a vital role in the supply chain, in providing linkages with farmers and exporters; value addition functions such as sorting and grading and carrying out other transport and distributive functions within the supply chain. The majority of farmers interviewed were primarily vegetable and fruit growers and only about 34 out of the 202 interviewed were flower farmers, large and medium scale located in clusters in areas around Naivasha and Thika.

Since 2004 activities carried out in the value chain such as sorting, grading, dicing, packaging and bar-coding are also carried out downstream, seeing major players participating in the chain. The horticulture value chain in Kenya comprises of relationships between various players in the chain with arm's length relationships in some cases, contractual farming is also observed especially between producer groups and large and small-scale exporters. The production end of the sector is dominated by small-scale farmers who have contracts with large-scale farmers and exporters. The small scale farmers also organize themselves in producer groups/cooperatives with which exporters also have contracts. Exporters mainly supply seeds and training on standards to the farmers who in-turn sell their raw products to exporters.

Exporters are in two main categories: large and small-scale and this is where the most value addition is done. Middlemen and brokers also play a major role in the sector especially for farmers who do not have contracts with exporters or supermarkets. They buy produce from farmers and sell it to exporters and in the process derive their share of profits, some may add value by mainly sorting and grading and in some cases even packaging (Figure 3.2).

The chain also highlights the role played by middlemen/brokers in linking smallholders to the export chain, they often play a vital role in buying produce from the smallholders, adding value through sorting and grading and selling to exporters at a higher price.

Information on standards and new requirements flows from the retailers to the importers and exporters and eventually gets to the production level. This is also often accompanied by information on new technologies and innovations, which stimulate upgrading at the lower end of the value chain At the meso-level, institutions such as umbrella organizations for producers and exporters, through which producers would obtain information as well, there are also supporting institutions like NGOs and ODAs which provide financial and technical assistance to producers in complying with standards, information dissemination and addressing other production related constraints through donor-market linkage programs some of which are in liaison with various government institutions. At the retail end, there are also retail chains and consumer organizations, which have initiated some of the standards such as ethical, environmental and social standards.

The Standards Chain

Standards in most cases have generally originated from mandatory requirements in developed countries such as food safety and health requirements as well as private standards, which are initiated by consumer organizations and implemented by supermarkets. Information on standards and new requirements flows from the retailers to the importers and exporters and eventually gets to the production level. This is also often accompanied by information on new technologies and innovations, which stimulate upgrading at the lower end of the value chain.

Consequently retailers in developed countries have developed systems that trace products from field to their supermarket shelves[17]; these often include social and environmental standards. Furthermore some of these standards are met at different levels; for instance exporters owning pack houses need to obtain phyto-sanitary certificates as well as HACCP and ISO certification which do not apply to producers or farmers; exporters also have to meet certain product specificity and conformity including packaging requirements all of which are met at pack-house level. Therefore in summary producers at the lower end of the chain only have to comply with standards related to GAP and social/welfare and environmental standards including soil testing and traceability requirements.

Figure 3.2: Horticulture Sector Value Chain

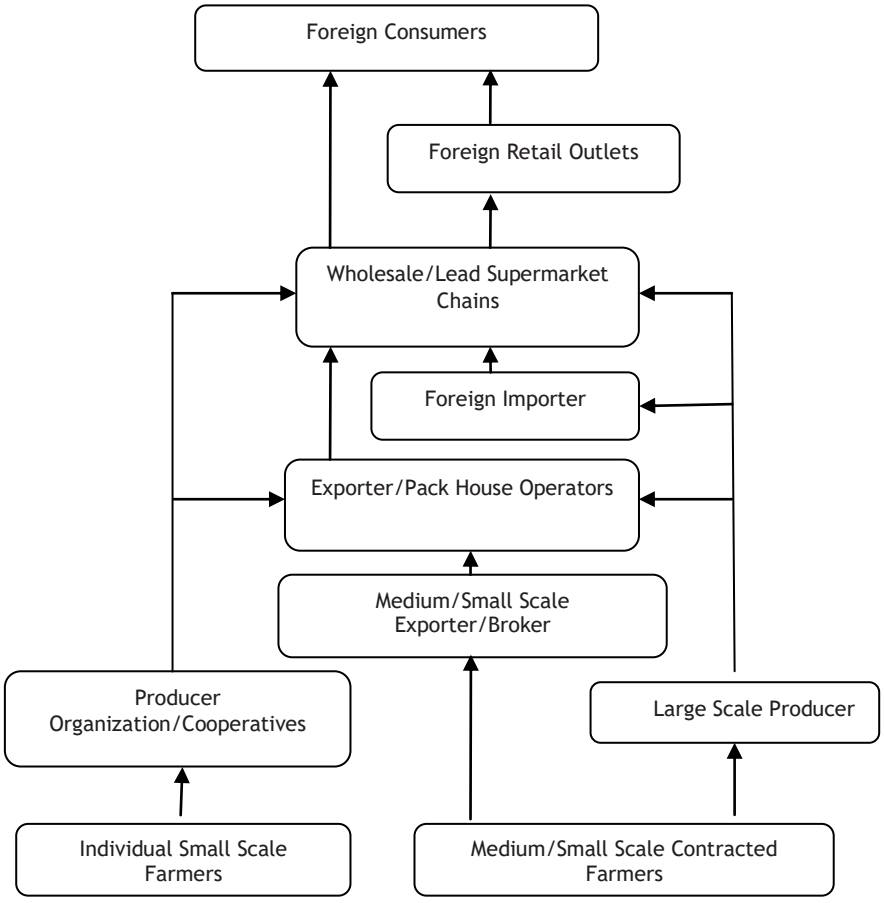


Table 3.1: Summary of Compliance Requirements and Legal Status for Standards for Exporters and Producers in Kenya

Compliance Requirement	Legally Mandated		Not Legally Mandated	
	Strict Enforcement	*Spot/Sample Enforcement*	*Required for Commercial Purposes*	*Not Required But beneficial*
Phyto-sanitary Certificate	✓			
MRL Tolerances		✓		
HACCP				✓
Traceability			✓	
GAP/Environmental				✓
Social Welfare				✓
Packaging Specificity			✓	
Product Conformity			✓	

Source: Survey data, 2009

From the above table it is evident that only two out of the eight types of standards are legally mandated requirements for exports into the EU, the rest of the standards are not legally mandated but are equally important in order for the exports to access the particular niche markets.

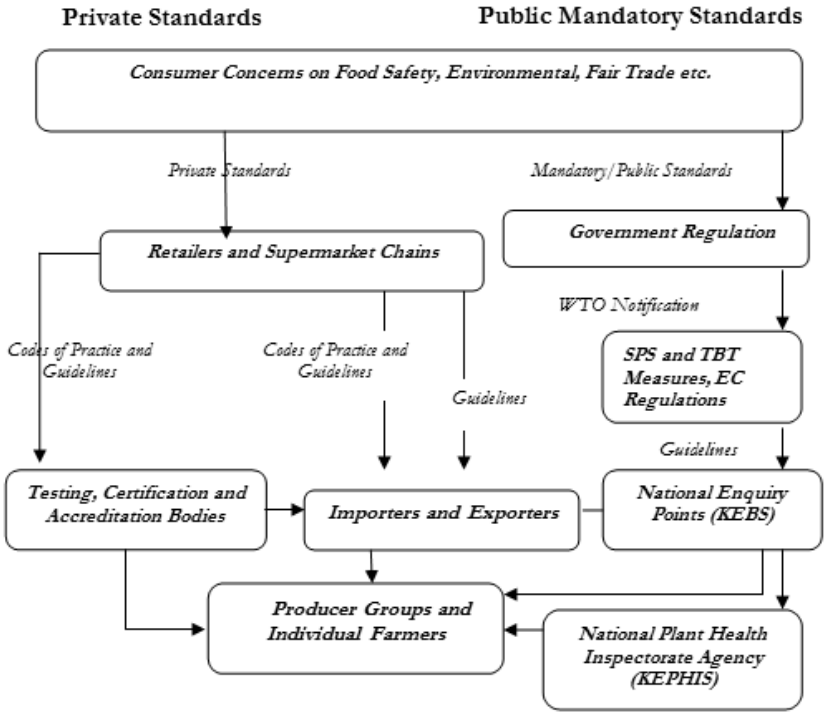
In addition to mandatory food safety requirements, Kenyan exporters have to comply with additional private voluntary requirements which are not legally mandated but are all the same very important requirements and include labelling and packaging and organic standards to access certain "niche" markets such as EUREPGAP/GLOBALGAP, FLO (see Table 3.2). They also require third party certifications and annual auditing.

Results from the fieldwork indicate that these standards are often passed down through exporters to producers. Consumers often initialize private standards; however retailers and supermarkets often produce their own codes of practice, which are passed on to importers and exporters. Testing and certification is then done to ensure compliance at both exporter level and producer level. Mandatory standards on the other hand are mostly initialled through governments perhaps as a result of consumer concern as well, these

mandatory/public standards have to be notified to the WTO SPS and TBT committees and then passed on to national governments as measures/requirements for exporting to a particular country, these are then obtained by National enquiry points which in the case of Kenya is the Kenya Bureau of Standards (KEBS) and which the develop guidelines for exporters and producers, this information is passed down to the Kenya Plant health Inspectorate services which is responsible for standards regulation and enforcement in the horticulture and crops sectors (Fig 3.3 below). It is therefore evident that producers and exporters have numerous standards they have to comply with in order to access developed country markets; and the have to go through both mandatory and private standards testing and inspection schemes in order obtain numerous certification some of which have to be renewed every year.

Over the years, each of the EU member states has developed its own arrangements for phyto-sanitary inspection for their standards, which have different requirements for certificates for different products/sectors. There has been some convergence has occurred with the determination of a number of 'notifiable' pests and diseases and a system for rapid alert communications among member state agencies; this convergence mainly came about when different EU countries harmonized their standards under the EU Food safety regulations of 2002. With regard to food safety, the main issues are the adoption of HACCP systems by supplier/exporters, the implementation of arrangements for product traceability, and the conduct of microbiological tests on products entering the EU.

Figure 3.3: Standards Chain in Kenya Illustrated



3.2.4 Legal Requirements for Export in the EU

There are several articles under EU regulations from 1994 to 2015 that stipulate the requirements for exporters of any food to the EU. These legal requirements also give instructions on how, when, where and by whom the controls are implemented and documented. Two specific EU requirements are discussed below.

1. Requirements to set up Competent Authorities

Article 46 (1) (b) and (c) of Regulation (EC) No 882/2004 stipulate that EU controls shall have, inter alia, particular regard to the organisation of Third Country's (CAs), their powers and independence, the authority they have to enforce the applicable legislation effectively, and the training of staff in the performance of official controls (Regulation EC, 882/2004). In Kenya the Competent authorities are as follows:

- KEPHIS (Kenya Plant Health Inspectorate Services): pesticide residue monitoring plans and analysis;
- HCDA: registration and control of exporters/pack-houses, implementation of traceability, training and control of farmers;
- Pest Control Products Board (PCPB) - authorization of Plant Protection Products (PPPs) formulation analysis of PPPs, registration and controls of PPP retailers and storage facilities;
- Kenya Agricultural Research Institute (KARI): research on Integrated Pest Management.

HCDA (Export) Order No 190 of December 2011 replaced the previous Order of 1995 (HCDA 2012). It empowers the authority to facilitate and enforce standards for all horticulture produce. The provisions include requirements for the safe use of pesticides and for traceability (detailed rules for traceability have yet to be adopted). Exporters have to be registered annually, and must have own production schemes or contracted growers. Exporters must keep records of their transactions and submit quarterly returns to HCDA. The order also provides for sanctions.

2. Official controls of pesticide residues in food of plant origin

Article 46 (1)(b), (c), (d), (e) and (h) of Regulation (EC) No 882/2004 stipulate that EU controls shall have, inter alia, particular regard to: the existence and operation of documented control procedures and control systems based on priorities, the CA's capability to enforce applicable legislation, the resources including diagnostic facilities available to competent authorities, the training of staff in the performance of official controls and the assurances which the third country can give regarding compliance with, or equivalence to, EU requirements (Official Journal of European communities, 2004).

Article 11 of Regulation (EC) No 178/2002 stipulates that food and feed imported into the EU for placing on the market within the EU shall comply with the relevant requirements of food law or conditions recognised by the EU to be at least equivalent thereto (Official journal of European communities 2002a).

Article 18 of Regulation (EC) No 396/2005 requires that products covered by Annex I of the same Regulation shall not contain, from the time they are placed on the EU market as food or feed, any pesticide residue exceeding EU MRLs, or 0.01 mg/kg for those products for which no specific MRL is set (Official journal of European Communities, 2005). The CODEX has also established MRLs for pesticides, which are considered for the establishment of EU MRLs (CAC/MRL 1-2009).

Commission Directive 2002/63/EC establishes EU methods of sampling for the official control of pesticides residues in and on products of plant and animal origin or equivalent international standards (Official Journal of European Communities 2002b) (e.g. CODEX Guidelines CAC/GL 31-1999). Article 10 of Regulation (EC) No 852/2004 in connection with Article 6 of the same Regulation requires that every FBO shall notify the appropriate CA of each establishment under its control that carries out any of the stages of production, processing and distribution of food (Official Journal of European communities 2004b).

The first national monitoring plan in Kenya for pesticide residues was implemented in 2009 with the assistance of the Horticultural Produce phyto-sanitary Certification and Quality Assurance

(HORTICAP), funded by the European Union. Before the implementation of the plan, a training supported by the Food and Agriculture Organisation (FAO) and HORTICAP was held. Monitoring has continued until the time of the audit. During the year 2012-2013 a total of 532 samples were taken and analysed by KEPHIS at the KEPHIS Analytical Chemistry Laboratory. Samples were taken in nine regions. A total of 46 samples tested positive with a total of six pesticides, which relates to 8.6 % of the samples. Following the inclusion of Kenyan peas and beans in Regulation (EC) No 669/2009 (Official Journal of European communities 2009), the monitoring plan was enhanced to include a more extensive number of samples of peas and beans in pods and other commodities. The plan provides for 8 000 samples to be taken per year, including 6 000 samples of peas and beans for export to the EU. KEPHIS stated that the number of samples and the sampling points are designed to provide statistical confidence of compliance for exported produce.

Risk factors are not included in the design of the programme. Samples are taken by trained HCDA staff from production areas, collection centres and pack houses, for analysis by KEPHIS. The sampling procedure followed the CODEX Guidelines CAC/GL 33-1999. To date, 270 samples of beans and 187 samples of peas have been sampled within the extensive programme. The main problems are maximum residue limits with dimethionate being the pesticide that caused the most common.

Exporters and pack-houses processing peas and beans for export to the EU are registered, as required by Regulation (EC) No 852/2004 (Official Journal of European Communities 2004b). Effective traceability systems have been implemented by the exporters, and the KEPHIS laboratory is accredited to ISO 17025 and has adequate facilities.

3.2.5 Compliance and Certification Processes in Kenya's Horticulture Sector

During the survey, it was observed that exporters are increasingly using standards for Quality Management Systems (QMS), this is more relevant due to the large number of small scale producers in the sector, a phenomenon which poses major challenges when monitoring them for compliance. Results from the survey indicate that farmers have to comply with various standards already summarized in table 3.3. However the most common are GAP and traceability standards, which are vital for the management of the supply chain. The standards were also observed to be getting complex as the chain progresses, in that at the exporters end, they have to comply with more and more standards, spot checks and inspections than at the production end as is illustrated in table 3.3.

The results from this survey indicate that most of the mandatory standards are actually met at the exporter level and not at the level of small-scale producers. While exporters have to obtain phyto-sanitary certificates and are mandated to meet MRLs, farmers are only mandated to meet GAP, traceability and social welfare standards. Other standards such as product specificity and product conformity are predominantly met at the exporter level unless packaging takes place at farm level as was observed in some few cases of passion fruit packing in Mwea /Kimbimbi area (See table 3.3 below).

Table 3.3: Summary Compliance Exporters vs. Farmers in the Horticulture Industry in Kenya

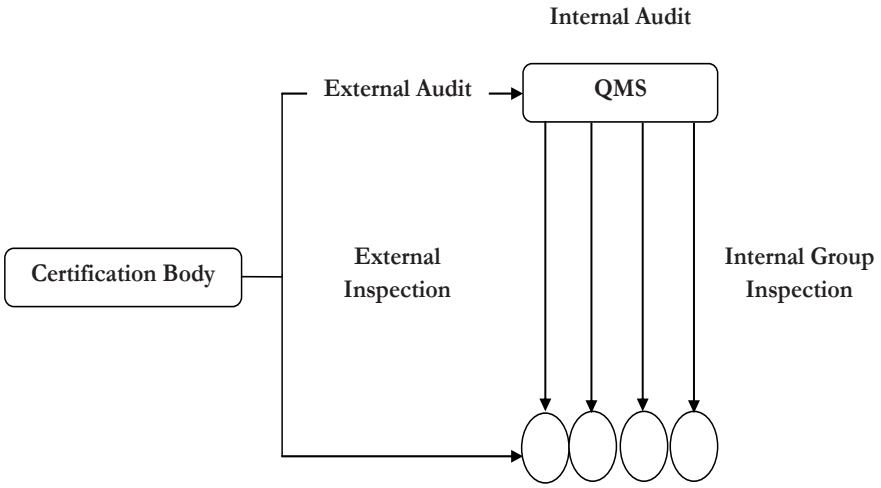
Compliance Requirement	Exporters	Farmers Including Small Scale Producers
Phyto-sanitary Certificate	All	N/A
MRL Tolerances	All	N/A
HACCP	All	N/A
Traceability	All	All but through exporters
GAP/Environmental	All	77%%
Social Welfare	All	41%
Packaging Specificity	All	4%
Product Conformity	All	4%

Source: 2009 Survey data

Exporters are therefore faced with the task of monitoring their respective producers and ensuring that their produce meets the required standards. However the survey further shows that in order to mitigate challenges posed by monitoring, the main chain players have adopted different systems for achieving compliance and certification especially with respect to GlobalGAP. They do this mainly through contractual arrangements with individual farmers as well as with producer organizations, which are an integral part of the chain.

In view of this, findings indicate that there are predominantly 2 options for certification; option 1 is the individual certification and option 2 is the group certification mainly for producer organizations. Under the individual certification option, an individual producer applies for the GlobalGAP certificate for one or more sub scopes. This usually entails putting up the required infrastructure and a Quality Management System (QMS) according to GlobalGAP requirements. External audit and inspection by a certification body is then carried out and a certificate issued thereafter if all the requirements are met. Large-scale producers and exporters mostly use this option. Small-scale producers who get certified through producer groups on the other hand, mostly use option 2. In this scheme of certification, groups of farmers are allowed to comply as a unit but only after satisfying requirements of both external and internal Audits (see fig 3.4 below).

Figure 3.4: GlobalGAP Option 2: Group Certification for Producer Organizations



Financial requirements for GlobalGAP certification in Kenya are high especially for small-scale farmers. These usually entail an initial cost of setting up which includes putting up the necessary infrastructure[18], additional labour requirements, additional managerial inputs and payment for soil testing and analysis. According to data from this survey, the initial cost of setting up these infrastructures and other additional requirements is approximately US$ 1200. Initial auditing costs are about US$ 300 per day for audit fees paid to the certification body (usually takes about 2 days), auditor sustenance fee of US$ 100 per day and a report fee of about US$ 125 (table 3.4 below).

The process of auditing a farmer for certification entails a checklist, which is used, and which requires 95% compliance for one to receive certification. Once certification is received, yearly inspection and auditing is done before renewal which implies recurrent costs. Clearly it is easier for large farms to comply than smaller farms and more specifically small-scale farmers who find it more difficult to comply

[18] Infrastructure includes pesticide and fertilizer storage, grading shed, cooling shed, toilet and bath, and hand wash facilities and sanitizers.

because of the cost implications. To reduce these costs for small farms, they use a collective certification scheme (GlobalGAP Option 2). Under this option, its costs approximately US$ 500 per farmer to implement the Global Gap certification, about US$ 400 is used as an initial cost for setting up the necessary infrastructure while the rest are recurrent costs (Table 3.4 below). Findings indicate that only 6 per cent of farmers interviewed were certified under option one, these were predominantly farmers with a larger farm size of about 10 acres who obviously had more resources; whilst 24 per cent were complying under option 2 through their respective producer organizations. However during the fieldwork, the issue of sustainability was raised because most of the producer organizations were initially being supported by donors and NGOs. However, they were not able to sustain the programs after the funding was stopped.

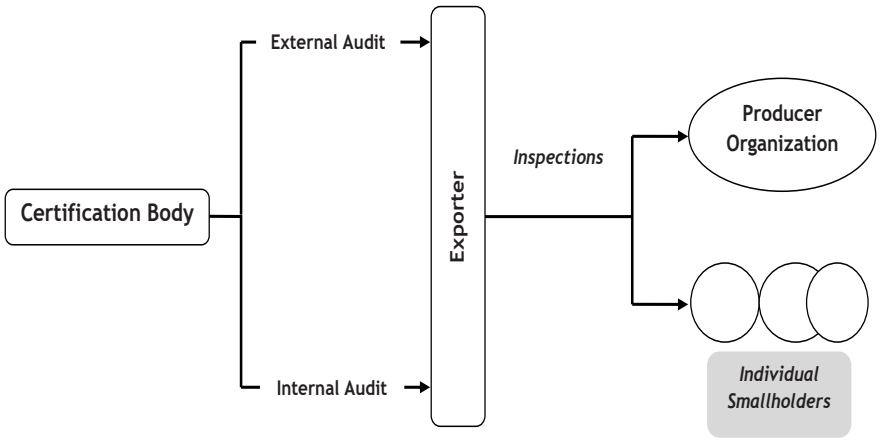
It is apparent that the second option offers a cheaper alternative especially for small-scale farmers and therefore makes it possible for them to get into the market. Still, there were certain cases where farmers did not belong to a group and were not able to comply on their own due to financial constraints leading to their exclusion. Also in some cases, some producer groups which previously received financial support from NGOs and other donors failed to renew their certificates due to lack of financial capability. In such cases, the groups did not disintegrate because new developments have enhanced the coordination of chain activities by exporters to ensure quality and upgrading. Under these new arrangements, farmers who were initially facing exclusion from the market are now able to comply through exporters with whom they have contractual arrangements. In this survey, this constituted about 33 per cent of smallholders (Fig 3.5 below). In this type of arrangement, the exporter is certified, and has the responsibility of ensuring that the farmers with whom they have contracts are complying and hence they provide loans for putting up the infrastructure and they audit the firms based on the GlobalGAP criteria. This is another step towards solving the problem of exclusion for smallholders.

Table 3.4: Summary GlobalGAP Certification Costs Option 1 vs. Option 2

	Option 1: Cost (US$)		Option 2: Cost US$	
Item	*Non-Recurrent*	*Recurrent*	*Non-Recurrent*	*Recurrent*
Physical Infrastructure	1200	-	400	-
Auditing	-	800	-	50
Report Fee	-	125	-	25
Soil Testing and Analysis	-	155	-	25
Total	2280		500	

Source: Survey data, 2009

Figure 3.5: GlobalGAP Compliance of Individual Smallholders Through Exporters



3.2.6 Localizing Global Standards in Kenya's Horticulture Sector

From a developmental perspective, localization and harmonization of global standards and procedures at the national and sectoral levels reduces compliance costs and testing and helps countries to achieve some form of equivalence (Otieno & Knorringa 2012). In addition, requirements such as traceability, record keeping and third party monitoring may also improve chain management and competitiveness,

transparency increases and trade becomes more predictable and easy to control (Kaplinsky, 2006; Tander and Tilburg 2007). In Kenya, there have been two main attempts at localization of global standards - the KS 1758 code of practice, a public mandatory standard for the horticulture industry and the KenyaGAP, which is based on the GlobalGAP initiative.

The KS 1758 code of practice was launched in 2002 and developed by the technical multi-stakeholder National Food Safety Committee under the aegis of the Kenya Bureau of Standards (KEBS). Stakeholders involved in the process were representatives in the technical committee and were from Ministry of Agriculture, Kenya Plant Health Inspectorate Services KEPHIS, KFC, HCDA, FPEAK and the Ministry of Trade. The code of practice has its origins from the Fresh Produce Exporters' Association of Kenya's (FPEAK) and the Kenya Flower Council (KFC) code of practice of 1988 and covers both fruits and vegetables. Its objective was to have a national baseline standard where all producers and exporters would be able to have clear and comprehensive production guidelines for the export market. It encompasses food safety and health, environmental concerns and worker welfare and safety. This code was harmonized with international agencies such as the UK's Integrated Crops Management and the USA's Environment Protection Agency.

However, the implementation of this code of practice and subsequent compliance has not been effective as close to 70 per cent of farmers interviewed in this study have never heard of it. In addition, its requirements entail high start-up costs, and having a management and traceability system in place which most farmers cannot afford. Furthermore, it is not required in the export destinations and would entail additional costs for exporters. Most importantly, since the code of practice has not gained international importance, complying with it would still not guarantee market access in the EU or other major export destinations. Exporters therefore, prefer to comply with existing standards in order to access markets in the EU.

The KenyaGAP Initiative was an attempt to benchmark standards based on *GlobalGAP* (then EUREPGAP). After the Kenyan experience with standards, there was a realization that there was a need for a localized standard for fresh fruits and vegetables. From 2002, the *KenyaGAP* initiative was developed from a revised code of FPEAK at

the same time incorporating principles of GlobalGAp and HACCP (FPEAK, 2007). Due to the need to localize and understand the aspects of GlobalGAP (then EUREPGAP), its formulation involved consultations with key industry stakeholders through a technical committee consisting of government ministries and bodies including agriculture, KEPHIS and HCDA, exporters and their associations, farmers and producer organizations and sector umbrella organizations such as FPEAK.

The process, interpretation and benchmarking of KenyaGAP took 2 years and independent EUREPGAP appointed auditors from the German standards and certification body (DAP) were invited to audit the standard. It became the first national scheme incorporating both industry and small-scale farmers concerns and covering the scope of fruits, vegetables and flowers. KenyaGAP has a recognized third party certification of farm production processes based on ES45011/ISO Guide 65, which specifies product handling, processing and packaging. In addition, it offers flexibility on compliance criteria. The options are Mandatory compliance (red), Required (yellow) and Recommended (green). This then leads to a multi-tier approach with the basic principles forming the Bronze code which is the minimum for all members including new members; Silver which is slightly more stringent and Gold code of practice which has the most stringent requirements and is mostly for the market leaders (Otieno & Knorringa, 2012).

However KenyaGAP Initiative still faces some challenges related to its implementation, dissemination and re-affirmation. First, FPEAK is the scheme owner for KenyaGAP but has not had it implemented throughout the country with smallholders partly because the process of third party certification has not been properly worked out. Secondly, there seems to be an overlapping certification because most exporters and producers are already GlobalGAP certified and still have to meet additional standards in order to access these markets. Thirdly, and most importantly, KenyaGAP is not yet recognized internationally and there are issues regarding its market penetration especially in the EU, partly because GlobalGAP is a buyer driven initiative and acceptance of KenyaGAP may raise concerns in the market.

3.3 Standards and Institutional Developments in the Horticulture Sector in Kenya

The institutional framework of value chains provides channels through which quality requirements can be introduced to producers and implemented. Institutions may also determine the relationships between chain actors and their organization and hence may influence adoption of certain requirements by actors Gibbon, (2001) & Laven (2007), furthermore actors and players in the value chain take strategic positions and try to influence certain functions and dictate the terms of participation by other actors in different functional positions in the chain (Laven, 2007).

According to North (1990) & Doward et al, 2005; institutions are "rules of the game" defining incentives or sanctions affecting people's behavior, institutions also encompass a set of structures put in place to 'guide' certain relationships between different actors at different strategic points. The institutional framework therefore, sets the local, national and international conditions and policies that shape the way in which various actors in the chain relate to one another. Laven, 2007 further argues that the institutional framework can either provide effective channels through which quality criteria can be introduced as part of upgrading or can create barriers against such introductions. Hence in this context, commodity chains are not viewed as "closed" systems, but as systems that receive inputs from the outside in terms of knowledge management, and are influenced by advocacy movements and by policy priorities set by governments (Laven, 2007).

In view of the above, institutional dynamics in the horticulture sector in the last 10-15 years have evolved around the establishment of standards, rules and regulations. Institutional organization has centred around 3 main types of institutions: *Legal and Regulatory Institutions, Enforcement Institutions* and *Facilitating Institutions. The Legal and Regulatory Institutions* are charged with formulating rules and regulations that govern the sector. These are mainly formal institutions mostly government and quasi-government institutions and includes the Kenya Bureau of Standards (KEBS) which is the National Codex Committee (WTO required) which handles mainly public/mandatory standards and the Kenya Plant Health Inspectorate Services (KEPHIS) through which rules and regulation related to plant health are handled. These

institutions are also responsible for disseminating information as well as training and capacity building for standards. On the other hand, *Enforcement Institutions* are necessary for monitoring the compliance of rules and regulations and are mostly related to private sector standards which often require third party certification. *Enforcement* is usually handled by private standardization companies such as AFRICERT, CMI, SGF and SGS[19]. These private companies often offer training, auditing and certification services to producers and exporters at a fee. Annual auditing and certification renewal is also handled by these private companies at a fee which is borne by the exporters/producers.

In addition, these *facilitating Institutions* that are primarily concerned with easing the adoption process and compliance, also provide financial and credit services as well as address other market related constraints and these include NGOs and credit and financing institutions, and producer organizations also referred to in this study as *market intermediaries*. These market intermediaries were formed mainly to help in chain coordination especially with exporters. The goal was to achieve economies of scale in terms of sharing costs for training and capacity building; upgrading; auditing and compliance related costs (Table 3.5). Producer Organizations (POs) are further coordinated under umbrella producer organizations such as FPEAK and the Kenya Association of Manufacturers (KAM). However, some key members of POs pointed out weak institutional interactions and linkages between their organizations and formal institutions.

This problem led to the development of new and interesting innovations in the provision of financial services. On one hand, donors are increasingly facilitating this process through various individual exporters who help farmers in upgrading, training and paying auditing and certification costs. One of the programs was initiated by COLEACP[20] (Europe-Africa-Caribbean-Pacific Liaison Committee) - through the Pesticides Initiative Program (PIP). Another new development has seen the proliferation of donor driven government

[19] SGS is an international organization whose role is to audit for certification under the ISO 9000X Series, ISO 4000, HACCP and the code of Practice.

[20] COLEACP is an inter-professional network promoting sustainable horticultural trade, gathering together ACP producers/exporters and EU importers of fruit and vegetables, flowers and ornamental plants, and other companies and partners operating in the ACP/EU horticultural industry

programs which operate as funding and support institutions (such as Micro Enterprise Support Program Trust (MESPT) & Assistance to Micro and Small Enterprises Program (ASMEP) in liaison with other financial institutions (such as Equity bank) that support POs for training and capacity building; as well as obtain certification and link the POs to markets/exporters. The financial institutions then liaise with exporters and deduct their dues from the individual farmers' incomes. One of the financial institutions' conditions is that a PO would only receive funding if the PO proves that it is active by submitting records of meetings and books to the financial institutions. Many farmers attest that these new developments in the financing of their requirements have helped in enhancing sustainability. The elements related to sustainability will be discussed further in chapter 6.

3.4 Conclusion

This chapter gives an overview of the developmental aspect of standards within the context of Kenya's horticulture sector. This analysis gives perspectives from a developing country value chain which is dominated by a large number of small scale producers, that are linked to the market via a number of intermediaries; producer organizations, exporters and middlemen and relatively few large scale producers.

Two distinct 'types' of standards in the horticulture sector emerge; mandatory (public) standards and voluntary (private) standards, which producers comply with in order to access the markets in developing countries. The direction of the flow of standards is north-south. Governments mainly apply public mandatory standards for the sole purpose of ensuring the safety and health of their consumers. They are mandatory and are based on international agreements i.e. WTO's SPS and TBT requirements - they are governed by law and are static. WTO regulations stipulate that countries may use additional standards to ensure the safety and health of the public provided the standards do not impede trade. The responsibility of enforcing compliance is left to retailers.

In recent years with the change of laws in the EU, there has been a shift in responsibility from public to the private sector leading to proliferation of private standards. Private standards on the other hand, are set to respond to continuously changing consumer tastes and

preferences and provide flexibility in response to this changing environment. Although they are voluntary, to access certain markets including 'niche' markets, which are very important for developing country producers, one must comply. The standards cover other consumer related needs such as sustainability, ethical production, fair trade and traceability. They also provide additional assurances that rules and regulations are adhered to because they require additional monitoring, enforcement, certification and accreditation. In addition, they give retailers a competitive edge by providing for differentiated products and credence goods and thus raise the bar for competition from attribute based to quality based.

The heterogeneity of standards makes compliance difficult for exporters while at the same time, it makes the analysis of their impact difficult. From the perspective of the horticulture sector in Kenya, standards embody information and technological features, which simplify chain management and creates opportunities for producers to upgrade and compete in globalized chains. Furthermore, 'niche' markets such as fair trade may have benefits for small holders due to related premiums.

Standards have implications on transaction costs in two ways; there are costs related to upgrading and costs related to certification, and as a result, the horticulture sector and chain participants have developed a number of 'innovative' ways of mitigating these costs such as group certification through producer organizations or through the use of exporters' single certification provided they ensure that producer's downstream are complying with requirements. In addition, the ability of producers and exporters to comply for instance to standards like GLOBALGAP and obtain certification substantially, reduces transaction costs of monitoring and thus improves chain efficiency especially if they are supplying to multiple retail outlets. Thus the cost of multiple certifications is reduced as well as testing and audits; furthermore, this gives Kenyan exporters the flexibility to supplying across the globe.

Attempts to localize and harmonize global standards through some initiatives in Kenya's horticulture industry saw the development of the KenyaGAP initiative and the KS -1758 code of practice which have contributed to the upgrading local production. However, a major setback observed with these attempts is that the harmonized standards

are still not be acceptable at the international levels and farmers still need to comply with global standards in order to access global markets.

Institutional developments presented in this chapter saw three main types of institutions that have come about as a result of standards. These are the legal and regulatory institutions that are mainly concerned with setting the rules and guidelines for implementation and largely consist of government and quasi-government institutions; facilitating institutions which offer both technical and financial support for producers and enforce compliance and largely consist of NGOs and credit institutions; and enforcement institutions which are mainly third party standardization bodies concerned with monitoring compliance and the issuing of certification. A 'new' crop of market intermediaries have also emerged such as producer organizations and other market dynamics that help farmers not only to comply, but also to access markets and reduce transaction costs.

From a developmental perspective, we can conclude that as a result of the proliferation of standards, development related outcomes are twofold, positive and negative. Some positive outcomes include the introduction of new ways of efficiently governing high value chains through the use of standards including 'new' forms of intermediaries that lower transaction costs for exporters and help farmers to access markets; the ability of the said standards to transfer technology and information and thus enable the upgrading of production chains hence the production of uniform quality and standardized goods thereby raising the bar for exporters and producers and increasing competitiveness. On the negative side, complaiance may lead to the the increase of transaction costs of for producers and lead to the exclusion of very small scale producers who are not able to comply as a result of the high transaction costs. The dynamic nature of standards may also further complicate the production processes for smallholders, as they may have to change their production processes to cope up with changes that may crop up such as additional standards.

Finally, the responsibility to ensure food safety and health rests with retailers who have since developed their own standards and means of verifying compliance. In effect, they have transferred these requirements (and costs) downstream to producers and exporters, which then predefines the governance of these structures and the power relations and ultimately the distribution of value and incomes along

these chains. Given these developments in the sector, the gist of this research is to present an inquiry into the impacts and the development related aspects of standards on different chain participants in the subsequent chapters.

4 Effects of Standards on Kenya's Horticultural Export supply

4.1 Background

4.1.1 Introduction

Recent developments in global trade have seen a decline in tariffs and a relative increase in the importance of Non-Tariff Measures (NTMs). Standards have thus become an important element in the regulation of global trade. As seen in previous chapters, although standards have been design to protect consumer safety and health, they have the potential to act as trade barriers with fixed and variable costs falling on developing country producers. These constraints may ultimately affect bilateral trade flows. Indeed, recent trade theory suggests that fixed cost measures such as product standards might play an important role in explaining the pattern of trade (Helpman, Melitz and Rubinstein 2008).

The increasing share of high-value commodities in the consumption basket of the households in Europe, higher incomes and urbanization, changing lifestyles, market integration and trade liberalization at global level have led to an increase in the demand for horticultural products in Europe. Much of the high value products come from tropical countries. In these countries, it is believed that the horticulture sector can be promoted as a means of agro-diversification, providing the much-needed impetus to the growth of the agricultural sector which supports over 60 per cent of the population in many of these countries through increase in trade, income and employment generation. This ultimately contributes to poverty reduction.

Standards and regulatory requirements can have implications on exports in several ways: one strand of literature quantifies the impact of standards on trade largely depending on panel data and cross country studies. Findings are that by and large standards are generally trade

restricting in a sample of developed countries (Moenius, 2004, 2006; Disdier, Fontagne & Mimouni 2008, Wilson & Otsuki, 2004; Anders and Caswell 2007, Burnquist & Souza 2010). The second strand of literature focuses on the effect of standards on costs of production and subsequent welfare of exporters and producers and how they create (Jaffee & Henson, 2004; Matoo 2000, Lacovone 2002). Other studies have also focused on the broader welfare and poverty effects of standards (McCulloch and Ota, 2002; Barron and Rello, 2000; Maertens and Swinnen, 2009a). Another strand of literature reveals that standards are generally trade restricting except in cases where standards are harmonized (Portugal –Perez, Reyes & Wilson, 2009; Czubala Sheperd & Wilson, 2009).

Although there is considerable anecdotal evidence that standards affect trade in the agricultural sector, quantitative evidence remains scarce and few studies have been done to assess this. Besides this, developing countries are known to face many constraints that ultimately increase trade costs. Other factors related to the macro-economic environment include Foreign Direct Investments (FDI); Infrastructure; and NTBs such as standards that may also affect supply capacity and subsequent export growth.

A number of studies (Oyejide, 2004; Oyejide et.al, 2004a, 2004b; and Ajakaiye & Oyejide, 2005) suggest more broadly that the export supply capacity constraints which face many African countries largely reflect weaknesses in their macroeconomic and trade regime, deficiencies of trade-related infrastructures and inefficiencies in trade-related inputs and services. In Addition, African countries face many export supply constraints related to trade facilitation, inefficient markets and international trade barriers such as standards. A study by Oyejide (2007) examines how policy regimes can provide complementary or compensatory measures to achieve exports; the study also identifies exchange and tax rates as major factors impeding exports in most countries in Africa. Infrastructure acts as a major impediment because most delays are caused by infrastructure related problems, infrastructure is therefore an important component of trade costs (Mbekeani (2007).

Lyakurwa (2007) has examined supply constraints related to transactions costs, and identifies 5 major types: constraints related to production; distribution constraints; trade financing and related constraints; trade facilitation related constraints; and marketing

constraints. Manduna (2005) also explores supply constraints facing Africa and comes up with the same classifications. Sector specific studies have also been done, specifically in Kenya by Graham et al. (2007) on the impact of EUREPGAP on several small-scale vegetable growers. Constraints were mainly identified as infrastructure based and those exacerbated by stringent standard requirements in the EU and other export markets (Onjala & Otieno, 2010).

Several approaches have been used in quantifying the impact of standards on exports. Welfare effect measures, cost benefit analysis, price wedge measures, surveys and gravity models are some of the different approaches that have been used. As evidence suggests, there are limitations associated with these methods as they mostly concentrate on inventories such as frequency while disregarding the regulation content and/or process attributes underlying the regulations (Fasarella et al, 2011). These studies also do not consider other macro-economic variables within the market that may affect exports.

This study contributes to existing empirical literature in two main ways; a quantitative analysis of the impact of standards on the horticulture sector gives a developing country perspective on an agro-food industry–horticulture[21] using a country specific, sector specific approach. Second, this dataset allows for the determination of the effects of standards on export supply in view of other factors that may constrain exports. This then raises the question: how much can we attribute these effects to standards? The chapter is organized in 4 main parts, the preceding section gives the introduction; this is followed by some empirical evidence in section 2; section 3 of this chapter gives an overview of the methodology used to measure the impact of various standards on Kenya's horticultural exports, section 4 presents and discusses the results of the analysis, and section 5 is the conclusion.

[21] The sector is critical a critical source of foreign exchange and important to the country's economy as it contributes 33 per cent of GDP.

4.1.2 Horticulture Sector Exports and Performance

As already mentioned in previous chapters, horticulture is the fastest growing agricultural sub-sector in Kenya, contributing close to 13 per cent of the GDP and it is the second biggest foreign exchange earner after tourism. The sector supports about 50,000 smallholders and at least 2.5 million Kenyans earn from horticulture (Omosa, 2004). As an export success story, the industry stands out from other agricultural sectors. Of the horticulture exports in the last ten years, flowers (specifically the export sector) lead with a 57 per cent value share. Fruits, on average, contribute seven per cent while vegetables are at 37 per cent.

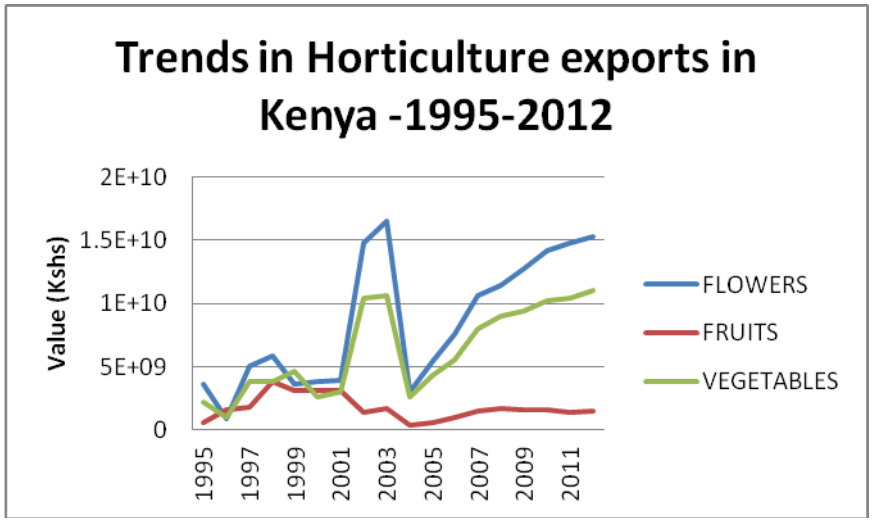
Favourable climatic conditions allows for a wide range of crops including fruits (tropical and temperate), vegetables (indigenous and exotic), nuts, herbs and spices, and flowers (summer and temperate). These crops are rain fed as well as irrigated. The variety of the horticultural crops grown in the country is varied and is seasonally erratic. Production is geared for both the export and the domestic market, there is incredible diversity in farm sizes, variety of produce, and the production systems employed. For purposes of this study, two main sub-groups fruits & vegetable and cut flowers will be looked at.

Fruit Production - consists mainly of tropical fruits - banana, avocado, mango, passion fruit, pineapple, pawpaw, citrus, white sapota and custard apple; temperate fruits - apples, plums, pears and peaches; and Nuts - macadamia nut. Vegetable production - consists of data on exotic export vegetables - cabbage, kale, tomato, onion, carrot, spinach, garden peas, French beans, baby corn, leeks, cauliflower, broccoli, shallots and lettuce. It also includes data on Asian vegetables and herbs and spices (chilli, garlic, coriander and celery). Cut-flower production-mainly temperate flowers (roses, carnation, statice and *alstromeria*) and summer flowers (*arabicum, tuberose and erygnium*). Ninety nine per cent of cut-flower production is geared towards the export market and is grown by a handful of large-scale farms.

Despite the general slowdown in agricultural output in the last ten years, the horticulture sector has grown rapidly in importance, driven mostly by flower exports. Flower exports now accounts for 2.5 per cent of GDP, which means it accounts for between 10 and 13 per cent of all exports. Kenya is now the leading flower exporter to the European

Union, with approximately 31 per cent of the market. Between 1995 and 2012 horticultural sector rose by 173 per cent in volume terms and 959 per cent in value terms (Figure 1). The main market for horticultural exports from Kenya is the European Union in particular Germany (6%), Netherlands (42%), United Kingdom (37%), France (9) and rest of EU (3%).

Figure 4.1: Trends in Horticulture Exports in Kenya 1995 - 2012



Source: HCDA

From figure 4.1 above, it is evident that exports have been rising steadily over the years, except for a dip in 2000 and 2004, which happened because of a temporary ban on some products from Kenya because they did not meet requirements of GLOBAL GAP (then EUREPGAP) because they exceeded maximum residue limits repeatedly. So far, the success of the Kenyan export horticulture industry has been attributed in part to Kenya's natural advantages for the production of horticultural crops. The agro-climatic conditions are ideal and Kenya's location on the equator enables round the year production–a characteristic not shared by competitors such as Egypt and Morocco (McCulloch & Ota, 2002). In addition, production is highly intensive in the use of relatively low skilled labour and therefore in keeping with Sub-Saharan Africa's comparative advantage in the

production of land and labour intensive goods. Kenyan exporters have also ensured that they supply high quality produce, in good time to their customers. The process was aided by the introduction of EUREPGAP (now GLOBALGAP) which is an equal partnership of agricultural producers and retailers whose aim is to establish certification standards and procedures for Good Agricultural Practices (GAP).

Trends show a general decrease in rejetions of cut flowers for documentation reasons - while the rejections of fruits and vegetables are almost double thaat of flowers. There are also a low number of rejections for cut flowers due to pesticide residues andut there are much higher figures for fresh fruits and vegetables. Fluctutations are also evident in th e number of rejections due to micro-organisms. The total number of reections have also continued to fluctuate.

4.2 A Review of Empirical Literature

Studies on export supply such as those of Goldstein and Khan (1978) have used two approaches, namely the equilibrium and disequilibrium models. The equilibrium approach embodies the hypothesis that as the price of exports rises relative to domestic prices, production for export becomes more profitable and, hence, exporters will supply more. More recent studies on export supply response have also applied methodologies similar to Goldstein & Khan (1978).

Islam (1990) identifies various factors affecting horticultural exports from developing countries, including GDP, the exchange rate, production, and social and physical infrastructure, and calculates the effect of these variables by estimating regressions in logarithmic form. In the first model, production, GDP, the real exchange rate, and the index of trade dependence are found to significantly affect exports. In the second model, GDP is replaced by two variables representing physical and human infrastructure, both of which are found to be significant. The share of manufacturing exports in total exports is also found to have a significant positive effect. The study calculates the price and income elasticities for the demand and supply of horticultural exports as: –0.71, 0.74, and 1.08, respectively. It also helps to identify an important variable, i.e., GDP, which can be used to capture the effect of the market size.

A study of the Australian citrus fruits industry by Gunawardana et al, (1995) explores the supply response of the industry using a “small

country" assumption and uses co-integration and error correction techniques using quarterly data from 1983 to 1993. Results from this study indicate that even in the long run, the supply of citrus exports is inelastic with respect to relative price. According to the findings, the domestic capacity also has a significant positive impact on export supply. In a study of the Brazilian export supply response, Carvalho J.L. and Haddad C.L (*undated*) tries to measure the effect of the main policy instruments, as well as the other exogenous variables, on export growth for manufactures and non-coffee NRB goods, covering the period 1955-74. The study uses a "small country " approach to explore the effect of various variables on export growth such as real exchange rates, the variation in real exchange rates, world imports, domestic income and short run changes in income and capacity utilization. The results from this study suggest that the altered real exchange rate was an important factor in Brazil's successful export growth of the late 1960s and early 1970s. The elasticity of world imports was also found to be positive and significant especially in growth of NRB exports.

A number of studies (Oyejide, 2004; Oyejide and Ogunkola (2004), Oyejide et.al, 2004; and Ajakaiye & Oyejide, 2005) suggest that more broadly, the export supply capacity constraints which face many African countries largely reflect weaknesses in their macroeconomic and trade regime, deficiencies of trade-related infrastructures and inefficiencies of the trade-related inputs and services. In this context, while considerable progress has been made in many African countries with regard to stabilizing their macroeconomic policy environment as well as liberalizing and rationalizing their trade regimes, much remains to be done. African Countries face many export supply constraints related to trade facilitation, inefficient markets and international trade barriers such as standards (Oyejide, 2006).

Biggs (2007) points to a large literature dating back to the 1970s that identifies government-imposed distortions in trade policy and regulation (e.g., taxes, labor laws) as key impediments to export development in low-income countries (Balassa 1971, Little, Scitovsky and Scott 1970). These distortions alter the allocation of domestic resources so that they are no longer guided by comparative advantage that creates an anti-export bias in incentives which make it attractive to invest in import-substitutes and unattractive to invest in export activities. The culprits cited are high and non-uniform nominal tariff

rates across sectors and over-zealous regulation. High tariffs provide negative protection to emerging export activities and high effective protection to import-substitutes, in some cases with negative value added, contributing to resource misallocation and the underutilization of capital in capital scarce economies. Excessive regulation increases compliance costs, which encourages an anti-export bias, and hinders the reallocation of resources in cases where trade liberalization necessitates adjustment.

Lyakurwa (2007) examined supply constraints related to transactions costs, and classified the constraints into 5 major types: constraints related to production; distribution constraints; trade financing and related constraints; trade facilitation related constraints; and marketing constraints. Manduna (2005) also explores the supply constraints facing Africa and mainly comes up with the same classifications.

The exchange rate can be a driver of export growth and diversification. Undervaluation (overvaluation) of the currency can bolster (undermine) export competitiveness, as it raises (lowers) returns to entrepreneurial activity, especially in the area of discovering new, high-productivity exports. What matters for incentives is the real exchange rate, the level of which is often rendered uncompetitive in low-income countries by poor macroeconomic management and turbulence in financial markets. Volatility of the real exchange rate is also very high for the same reasons, creating a risky climate for new export investment, as it makes future returns and payments uncertain (Biggs, 2007). Oyejide (2007) has identified exchange and tax rates as major factors impeding exports in Africa.

Kiptui M. (2007) study investigated the impact of the real exchange rate on the demand for Kenya's exports in an export demand framework which also includes economic activity for Kenya's major export categories: tea, coffee, horticulture and manufactured goods. Bounds testing and ARDL approaches to the analysis of long-run relationships and error correction modelling were applied. The existence of long-run relationships is established for coffee, tea and horticulture exports but rejected for manufactured goods exports. The results indicate that the real exchange rate has positive effects in the short-run but the effects are found to be statistically insignificant. Nevertheless, the short-run elasticities are high and positive as in the case of coffee

and manufactured goods which are close to unity. The results however confirm the dominant role played by economic prosperity of the export destination countries as demonstrated by significant positive long-run and short-run elasticities. The short-run income elasticities are close to one for tea, horticulture and coffee. The long-run income elasticities are high, ranging from 1.0 for tea to 2.4 for horticulture and 2.8 for coffee.

While their exports face increasingly stringent and complex health, safety and environmental standards (Oyejide et.al, 2001), they also lack the appropriate standard, quality assurance, accreditation, and metrology (SQAM) systems for meeting these requirements. African countries do not, typically, have access to cost-effective systems of certification. Furthermore, constraints at the firm level relating to production and marketing know-how, access to finance and the institutional structure of production limit export supply response even when macro-level reforms are adequate (Biggs et.al, 1994).

Poor infrastructure is generally regarded as one of the main causes of Africa's low competitiveness, especially as it imposes high costs and risks on investors (Oyejide, 2006; Mbekeani, 2007). These deficiencies frustrate the development of higher value added export products that depend on timely delivery. To the extent that inadequate infrastructure impedes the integration of markets – nationally, regionally and globally – the attractiveness of specialization in high value export products is limited. But, while Africa needs infrastructural services such as telecommunications, power, transportation, water, sanitation and finance, their efficient development in the region is rendered especially difficult by the region's low population density and the large number of small and landlocked counties. Hence, a comprehensive export development strategy should include appropriate measures to support the strengthening of production and technical learning as well as international linkages aimed at the transfer of technology and "best practice" production and marketing methods (Oyejide, 2006).

In their analysis of the FDI in Kenya, Mwega and Ngugi (2007) indicate that FDI has not played an important role in the Kenyan economy despite the reforms that have been undertaken and the many incentives provided to foreign investors. They note that FDI flows to Kenya have not only been highly volatile, but they generally declined in the 1980s and 1990s. The FDI mainly went to agriculture, manufacturing and services. The contribution of FDI to Kenya was

crowded by the deteriorating business environment characterized by rising costs, ethnic infighting and persistent corruption.

The literature review highlights two important points. First, it supports the use of co-integration to analyse time-series data; second, it helps to identify the major variables determining the export of perishable goods at the macro-level. As mentioned earlier, this study was conducted to evaluate the impact of major variables (domestic production, GDP, infrastructure, and the relative price index) on horticultural exports from Pakistan using co-integration and ECM techniques.

4.3 Empirical Approach

4.3.1 Data

The data on exports runs from 1995 to 2012 and is obtained from EUROSTAT and HCDA, other variables such as FDI is obtained from World Bank Database and covers both Private and Public investments, CPI, GDP and Exchange rates are obtained from the Kenya National Bureau of Statistics (KNBS) (Statistical Abstracts, Economic Surveys) and United Nations Conference on Trade and Development (UNCTAD), standards data is obtained from WTO's Database and information from Kenya's HCDA. Variables of importance include Exports (exp), GDP per capita (GDPcapita), Real Effective Exchange Rate (reer) which is computed using data from UNCTAD, Inflation (CPI), Public Investment (INVpub), Private Investment (INVpri) and FDI (FDI-flows), Standards notifications (STwto, STtbt a) and data on rejections of produce. All the data is presented on a quarterly basis.

4.3.2 Methodological Framework

The performance of exports depend on the interaction of the demand and supply-side factors. The demand side factors are often external to the country in question and most often are related to tariffs, or rules and regulations of the importing countries. Other non-price factors such as Non-Technical Barriers to trade such as SPS measure and other quality control measures may also be considered as demand side factors affecting export supply. Among the factors in the macro-economic environment that impinges on export supply response capacity at the

aggregate economy are the investment regime, the level of investment – both domestic and private investment; real effective exchange rates; and foreign direct investment (FDI) flows. Investment in the exporting sectors is critical for sustenance of export growth and ensuring technological capability. There are compelling reasons for expecting exports to benefit differentially from public and private investment since they all tend to target different types of capital (i.e. public investment might target some infrastructural capital such as roads, electricity, water etc. while private investment might target technological capability).

This infinite elasticity of export demand allows for the estimation of a single equation for export supply function. Therefore in modelling horticultural exports trade, a supply function derived from the assumption of profit maximization on the part of producers and exporters is specified. Since the exports are supply constrained, an increase in the production capacity of the economy is likely to have appositive effect on the exports and vice versa

Both supply side and demand side constraints may affect export supply. In this case demand side constraints from developing countries are mainly standards and regulations and preferential market access. The supply side constraints are economic variables within the exporting country that may affect or constrain exports.

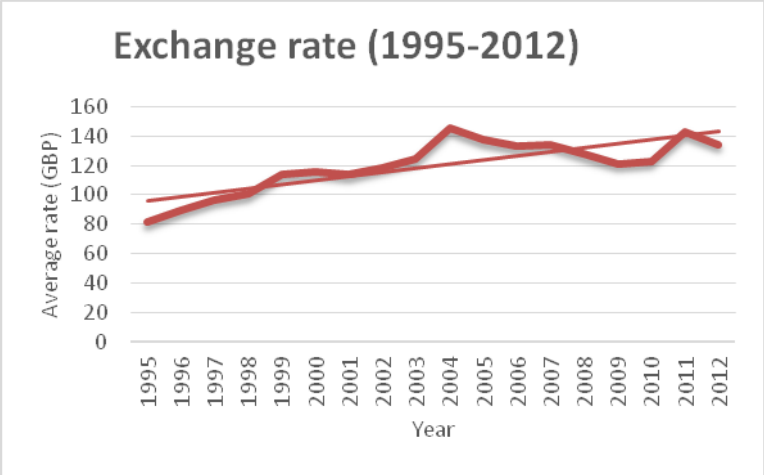
An export supply response model of horticulture exports is estimated using co-integration and ECM techniques applied to secondary quarterly data for the period 1995–2012 collected from various sources including the FAO database, and various volumes of the government of Kenya Economic Survey and Horticultural Crops Development Agency (HCDA). Johansen's approach is used to test for co-integration between horticultural exports and its explanatory variables, and the ECM is used to estimate short- and long-run elasticities. The Granger causality test is conducted to determine the direction of causation between variables to draw policy conclusions.

Variable Description

1. Real Effective Exchange Rates (REER)

Over the past several decades, Kenya has moved towards increasingly market-determined trade and exchange rate regimes. Kenya's fixed exchange rate regime was replaced by a crawling peg which, in turn, was eventually replaced by a floating regime. Figure 4.2 below show the trends in exchange rates between 1995 to 2012 and there is a general steady increase with some fluctuations.

Figure 4.2: Trends in exchange rates



Source: KNBS

REER is defined as the measure of nominal exchange rate adjusted from for price differentials between Kenya and its trading partners. The real exchange rate is an important price transmission instrument for exports decisions. REER is computed using nominal the exchange rate data relative to price differentials between Kenya and its trading partners (mainly the EU). The annual data on REER was obtained from UNCTAD and interpolated into quarterly basis using E-views version nine.

Algebraically,

$REER = NEER\left(\frac{P^*_{it}}{P_{jt}}\right)$ where; $\frac{p^*_{it}}{p_{jt}}$ is the effective relative price indices or the weighted wholesale price index of trading partners and the consumer price index for the home country. The subscripts *j*, *i* and *t* represent country, trading partner and period respectively. P^*_{it} is the total trade weighted wholesale price index of the trading partners representing the price of tradable, and P_{jt} is the CPI of the domestic country used as a proxy for price of non-tradable.

On the other hand,

$NEER = 100 \times \left[\left(s^*_{1t}\right)^{w^*_i} \times \bullet\bullet\bullet \times \left(s^*_{nt}\right)^{w^*_n}\right]$. In compact notation this can be written as, $NEER = 100 \times \prod_{i=1}^{n}\left(s^*_{it}\right)^{w^*i}$.

$s^*_{it} = s_{it} / s_{i0}$, $s_{it} = 1 / R_{it}$ and $\sum_{i-1}^{n} w^*_i = 1$ where $w^*_i = \frac{w_i}{\sum_{i=1}^{n} w_i}$ and

$w_i = w^x_1 v_x + w^i_m v_m$

Where $\prod_{i=1}^{n}\left(s^*_{it}\right)^{w^*i}$ =product of the shares of the exchange rates of the individual trading partners (exchange rate in the period under review divided by exchange rate in the base period) raised to the power of their weights in the base period.

R_{it} =nominal exchange rate of shilling per unit of the currency of the i-th trading partner in period t.

S_{it} = 1/nominal exchange rate of the shilling per unit of the currency of the i-th trading partner

S^*_{it} =index calculated as a share of the exchange rate of the currency of the i-th trading partner per 1 shilling in period t divided by exchange rate of the foreign currency of the i-th trading partner in the base period

w_i^* = sum of the standardized weights of the shares of the foreign trade of the individual trading partners equals 1

W_i =weighted average of the share of the i-th trading partner's exports and imports in the exports and imports of the Kenya

W_i^x = share of the exports of the i-th trading partner in the total exports of Kenya

V_x = share of the exports of Kenya in the total turnover of Kenya

W_i^m share of the imports of the i-th trading partner in the total imports of Kenya

V_m = share of the imports of Kenya in the total turnover of Kenya

Evidence already adduced provides strong indications in the literature which link exchange rate policy to export performance. Maintaining realistic exchange rates is one of the key components of a rational export regime. Allowing exchange rates to adjust to more realistic levels could lead to significant increases in the production and export of such items as high-value horticultural products for which many African countries may have an underlying comparative advantage.

2. Income Per Capita

A single variable – income per capita - cannot by itself explain the structure of the exports trade. However, per capita income reflects the effects of economic processes and is usually regarded as an indicator of country's level of development. If the predictions of the Hecksher-Ohlin theory are correct, we expect to find (a) a positive relationship between income per capita and the share in the total industrial exports of (human and physical) capital intensive goods and (b) a negative relationship for labour intensive goods.

3. Inflation (CPI)

Inflation triggers a host of other things such as a rise in the prices of inputs and consequently this increases the cost of production and may be a disincentive for exports (Biggs Tyler, 2007; Oyejide, 2007). Data on inflation was obtained from KNBS in quarterly form.

4. Foreign Direct Investment

Foreign direct investment (FDI) can play a significant role in promoting economic development in low-income countries by serving as a mechanism through which superior technology and managerial know-how can be transferred to such countries. The sign and magnitude of the net incentive generated by the public and private investment will be different over various time periods and across a number of export product groups. An important part of this study is to draw inferences on the net incentive regarding investment policy (reflected by FDI flows, private, and private investment) on horticultural exports.

FDI flows can play a significant role in promoting economic development by serving as a mechanism through which superior technology and managerial know-how are transferred to the country. FDI capital flows are virtually everywhere subject to a mix of restrictions and incentives. An export incentive framework is embedded in the incentive regime of any typical country which has implications not only for the allocation of savings but also for exporting activities generated by the FDI flows (Oyejide, 2007).

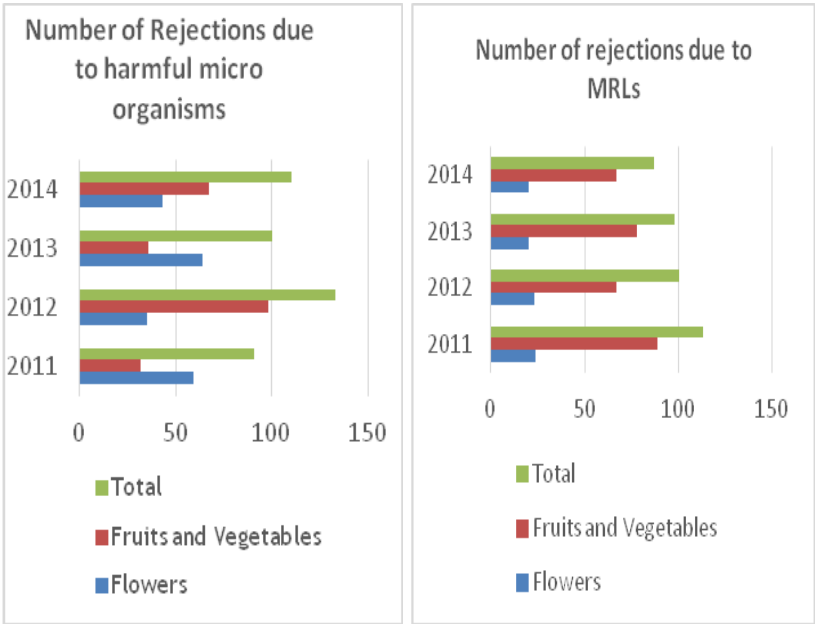
5. Standards

Standards affecting Kenya's horticulture sector are classified according to process and product standards as well as private labelling and traceability and based on SPS WTO notifications. A further classification is based on the private voluntary standards that key players in the horticulture industry have to comply with on order to access the EU market. The classification in this paper is therefore based on the WTO notifications and information related to standards (chapter 2 above) and classified into 2 main categories: WTO sanitary and phyto-sanitary (SPS) measures and TBT measures. These are then further classified into product measures, process measures, conformity assessment, and traceability requirements (Appendix 4.1). Data on WTO notifications was obtained from WTO database. The other data used is rejections data which is a proxy for stringency. The rejections data is obtained for both flowers and fresh fruits and vegetables and is obtained from RASFF data base.

Border rejections of Kenya's exports intensified since the introduction of EUREPGAP and the revision and introduction of EU regulations already discussed in the above sub-sections. KEPHIS has

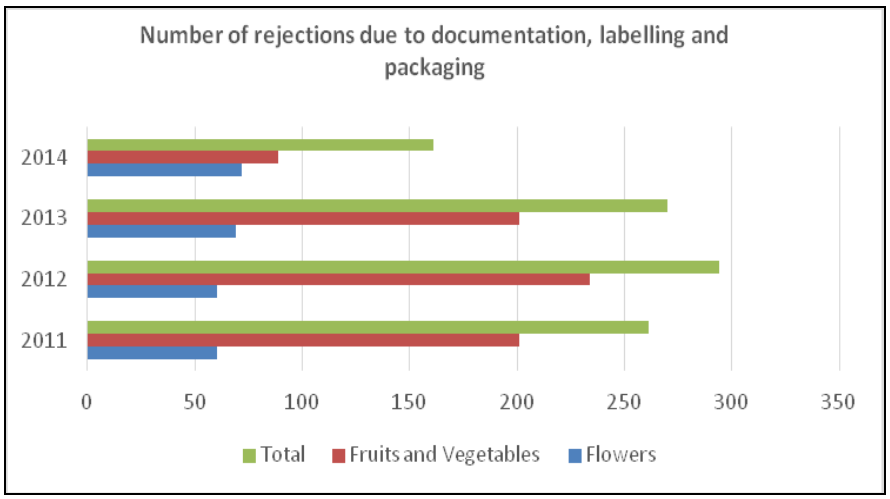
pointed out that 52% of interceptions are attributed to documentation while 48% is due to quality parameters. Of the 48 per cent attributed to quality about half are attributed to harmful micro-organisms ie bacteria, fungi and viruses while 23.8 per cent can be attributed to pesticide residues. The pesticides exceeding EU Maximum Residue Level (MRLs) in these checks included acephate, chlorpyrifos-ethyl, diafenthiuron, dimethoate, indoxacarb, methomyl, methamidophos and omethoate. In a few cases, the concentrations detected presented a possible acute health risk to consumers. For instance in the second quarter of 2013, the non-compliance rate for beans from Kenya was 2.8 % and for peas it was 9.6 %. Figure 4.2 below gives trends in rejections from 2011-2014 due to micro-organisms and maximum residue limits for pesticides.

Figure 4.3(a): Trends in Export Rejections for Cut Flowers and Fruits and Vegetables Due to SPS measures (2011-2014)



Source: EU commission data base of food safety and plant health and RASSF http://ec.europa.eu/food/plant/plant_health_biosafety/europhyt/interceptions_en.htm

Figure 4.3 (b): Trends in Rejections Due to TBT Measures



Source: RASFF

As already discussed in previous sections, the role of standards and other NTBs cannot be underestimated. These Standards not only act as barriers to trade but also increase transaction costs thereby impeding exports. Considering that Kenya's exports constitute a small proportion of the world's exports, Kenya therefore takes the demand conditions of the importing countries as given and is infinitely price elastic.

4.3.3 Model Specification

The export supply response model, which is a variant of the Ahmed (2000) has been used to examine the determinants of export supply - the gist of this study. In the model, macro-economic variables are incorporated to accommodate the different effects they might have on exports. Per capita income has been included to capture the level of development in Kenya.

By taking the log form, we estimated a correction model for the equation expressed as follows:

$$lnHORTEXPORTS_{ti} = \alpha_0 + \alpha_1\, lnGDPcapita_t + \alpha_2\, lnREER_t + \alpha_3\, lnCPI_t + \alpha_4\, lnFDI_t + \alpha_6\, lnREJECTIONS_t + \alpha_7\, dSPS_t + \alpha_8\, dTBT_t + \mu_t \quad \ldots\ldots(1)$$

Where:

HortEXPORT	*The value of horticultural exports*
GDPcapita	*The predicted values of real GDP weighted by the population and used as a proxy for the measure of incomes*
REER	*Real Effective Exchange Rate*
CPI	*A proxy for domestic price level*
FDI	*Foreign Direct Investments*
dSPS	*Dummy Variable for SPS notifications*
dTBT	*Dummy Variable for TBT notifications*
U	*The random disturbance term wth its usual classical characteristics*

Kenya's horticultural export sector is seen by some as among the most successful in sub-Saharan Africa and a model for other countries in the developing world. Horticultural products have accounted for two-thirds of all growth in agricultural exports and recently surpassed coffee to become the second largest merchandise export, after tea (Onjala & Otieno, 2010).

A second and third model were created to determine the effects of these standards on various segments of horticultural exports i.e. fruits and vegetables vs. cut flowers:

$$lnCUTFLOWERS_{ti} = \alpha_0 + \alpha_1\, lnGDPcapita_t + \alpha_2\, lnREER_t + \alpha_3\, lnCPI_t + \alpha_4\, lnFDI_t + \alpha_6\, lnREJECTIONSFLOWERS_t + \alpha_7\, dSPSFLOWERS_t + \alpha_8\, dTBTFLOWERS_t + \mu_t \quad \ldots\ldots(2)$$

Where:

CUTFLOWER	*The value of cut flower exports and te rest of the variables s described in equation 1 above*

dSPSFLOWERS	*Dummy variables for the SPS measures affecting flower exports*
dTBTFlowers	*Dummy variables for the TBT measures affecting Flower exports*
Rejections	*Rejections affecting flower exports*

$$lnFFV_{ti} = \alpha_0 + \alpha_1\ lnGDPcapita_t + \alpha_2\, lnREER_t + \alpha_3\, lnCPI_t + \alpha_4\, lnFDI_t + \alpha_6\, lnREJECTIONSFFV_t + \alpha_7\, dSPSFFV_t + \alpha_8\, dTBTFFV_t + \mu_t \quad \ldots \ldots (3)$$

Where:

FFV	*The value of fresh fruits and vegetable exports and the rest of the variables are as described above in equation (1)*
dSPSFFV	*Dummy variables for SPS measures affecting Fruits and vegetable exports*
dTBTFFV	*Dummy variables for TBT measures affecting Fruits and vegetable exports*
Rejections	*Rejections affecting FFV exports*

4.4 Results and Discussion

4.4.1 Descriptive Statistics

Table 4.1 Descriptive Statistics for Exports of Horticulture

	Exported flowers	Exported fruits	Exported vegetables	Rejections (Total)
Mean	2,131,886,033.5	444,419,716.2	1,568,695,985.0	16.0
Median	1,627,714,620.0	407,539,420.5	1,221,082,944.5	14.5
Maximum	4,557,373,671.0	990,127,854.4	2,951,263,422.0	40.0
Minimum	151,624,813.9	11,814,858.8	183,292,334.8	1.0
Std. Dev.	1,293,049,153.5	234,035,560.4	879,740,020.9	8.1
Skewness	0.2	0.6	0.1	0.8
Kurtosis	1.6	2.8	1.5	3.5
Jarque-Bera	6.1	4.4	6.9	7.9
Probability	0.0	0.1	0.0	0.0
Sum	153,495,794,413.9	31,998,219,564.6	112,946,110,921.2	1,155.0
Observations	72.0	72.0	72.0	72.0

Source Author, 2015

Table 4.1 above shows the descriptive measure of the horticultural products under consideration in this study. Firstly it is notable that flowers recorded the highest average value of exports at Ksh 2,131,886,033.5, followed by vegetables at Ksh 1,568,695,985.0 and finally fruits at Ksh 444,419,716.2. The total rejection of the horticultural seems to be registering a relatively small value. The Jargue-Bera statistics reveals that the variables are normally distributed at 10% level. On the other hand, the standard deviation reveals that the export of vegetables was more volatile compared to the rest of the exports.

Table 4.2 Descriptive statistics for Macroeconomic variables

	GDP	NEER	CPI	FDI
Mean	233676.8	98.69412	70.26357	33821518
Median	273712.9	98.54831	61.02658	19164181
Maximum	409404.0	117.1847	133.6271	1.93E+08
Minimum	8246.970	78.01750	33.06388	282444.8
Std. Dev.	137995.1	10.37479	29.41806	43205984
Skewness	-0.663030	-0.205611	0.670530	2.384089
Kurtosis	1.872397	2.296697	2.330389	8.470192
Jarque-Bera	9.089776	1.991214	6.740462	157.9756
Probability	0.010621	0.369499	0.034382	0.000000

Source: Author 2015

Table 4.2 above shows the descriptive statistics for macroeconomic variables used in the model before logarithm transformation. The GDP was KSH 2.3 trillion on average while foreign direct investment recorded an average value of KSH 33821518. On the other hand, the consumer price index and the real exchange rate recorded a mean of 70 and 98 respectively. The Jargque-Bera probability tests also reveal normal distribution of the variables.

4.4.2 Time Series Properties of the Data

Unit Root Tests

As is customary in time-series analysis, prior to estimating Equation (1) and (2), the time-series properties of the individual series must be tested. The order of integration of the individual time series was determined using the augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests. The results, indicate that except for CPI and FDI all series are $I(1)$ at a 5% significance level. This implies the possibility of co-integrating relationships. Unit root tests are determined as follows:

$$\Delta X_t = \alpha_0 + \beta_t + \delta X_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta X_{t-1} + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(4)}$$

Where X_t = are the above variables in their log form at time trend t

X_{t-1} *is the first difference with k lags*

ε *is the residual white noise*

The coefficients $\beta_{o,}$ δ_o, μ_t, α_a…….α_k are parameters being estimated. The null and the alternative hypothesis for the existence of unit root in variable X_t is:

H_0: $\delta = 0$(X_t is a non stationery or contains a unit root)

H_1: $\delta < 0$(X_t is stationery or non-unit root)

Table 4.3: Results for Unit Roots (Non-dummy Variables)

Unit root test with trend and intercept							
Variable	ADF		P-Value	PP			conclusion
	Level	1st Difference	P-value	Level	1st Difference	P-value	
LNHORTEXPORT	-2.7078	-4.8866	0.0001	-2.0073	-4.8963	0.0001	I(1)
LN_FLOWER EXPORT	-2.9012	-4.8809	0.0001	-2.1525	-4.8829	0.0001	I(1)
LN_FFV EXPORT	-2.8508	-4.8131	0.0002	-2.0132	-4.9097	0.0001	I(1)
LN-GDP_CAPITA	-1.9528	-5.8435	0.0000	-1.6906	-5.5328	0.0000	I(1)
LN_REER	-1.7523	-8.5242	0.0000	1.6226	-8.4500	0.0000	I(1)
LN_CPI	0.3353	-7.1439	0.0000	0.2854	-7.0778	0.0000	I(1)
LN_FDI	-3.2916	-9.1500	0.0000	-3.5299	-9.1500	0.0000	I(1)
LN_REJECTIONS	-3.2769	-16.2063	0.000	-6.2063	34.3474	0.000	I(1)

**I(1) Integration of order 1*

Source: Author 2015

This test shows that all the variables are non- stationary in levels at 1per cent, 5per cent and 10per cent significance level i.e integrated in the order of I (1). We then test for co-integration to determine if there are any variables that are related.

Johansen Co-integration Tests

This step investigates whether the stochastic trends in the variable, which is supposed to contain unit roots, have a long-term relationship. For the co-integration test, the most commonly used methods are the Engle and Granger (1987) and the Johansen (1988) and Johansen and Juselius (1990). The Johansen and Juselius test is a method of co-integration testing based on the maximum likelihood estimation of the VAR model to determine the number of co-integrating vectors in the analysis. In this technique, two test statistics are involved in identifying the number *(r)* of co-integrating vectors, namely the trace test statistics and the maximum eigen-value test statistics. The trace statistics hypothesize in the null hypothesis that there is a maximum of *r* co-integrating vectors against the alternative of *r* or more co-integrating vectors. Meanwhile, the maximal eigen-value statistics tests are for *r* co-integrating vectors against the alternative of *r*+1 co-integrating vectors.

We consider equation 4 below using Johansen's full information maximum likelihood procedure:

$$y_t = A_1 y_{t-1} + A_2 y_{t-1} + ... + A_\rho y_{t-\rho} + \varepsilon_{t-\rho} \ldots\ldots\ldots\ldots\ldots.....(5)$$

Where y_t is a *k* vector of non-stationary I (1) variables in the A with I=1…, ρ is a lag operator and ε_t is the white noise residual of zero mean and constant variance and with a lag order ρ Akaike's Information criterion (AIC)

Since variables have unit root, we tested for long run relationship using the Johansen and Juselius (1990) approach to establish the co-integrating vectors. Trace and Eigen statistics were used to test the number of co-integrating vectors, based on the characteristic roots (Table 4.4).

Table 4.4: Johansen Co-integration Tests

VAR Lag Order Selection Criteria

Lag	Log L	LR	FPE	AIC	SC	HQ
0	-208.4819	NA	2.68e-05	6.499452	6.698512	6.578110
1	201.6519	733.2695	3.21e-10	-4.837936	- 3.444520*	-4.287331
2	264.0842	100.2700	1.48e-10*	-5.638915*	-3.051141	-4.616362*
3	294.3780	43.14576	1.88e-10	-5.466001	-1.683870	-3.971501
4	319.6713	31.42492	2.99e-10	-5.141553	-0.165065	-3.175106
5	340.6483	22.24834	6.00e-10	-4.686311	1.484534	-2.247917
6	402.0075	53.92178*	4.14e-10	-5.454773	1.910429	-2.544432

* indicates lag order selected by the criterion

LR: Sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Source: Author 2015

According to the results, majority of the lag-length selection criteria suggest 2 lags as optimal. Additionally we carry out the rank test and maximum eigen value test. The rank test is based on the log-likelihood ratio $\ln[L_{max}(r)/L_{max}(k)]$, and is conducted sequentially for $r = k\text{-}1,...,1,0$. The name comes from the fact that the test statistic involved is the trace (= the sum of the diagonal elements) of a diagonal matrix of generalized eigenvalues. It tests the null hypothesis that the co-integration rank is equal to r against the alternative that the co-integration rank is k. The latter implies that X_t is trend stationary. The maximum eigenvalue test examines whether the largest eigenvalue is zero relative to the alternative that the next largest eigenvalue is zero. The first test is a test whether the rank of the matrix Π is zero. The null hypothesis is that rank (Π) = 0 and the alternative hypothesis is that rank(Π) = 1. For further tests, the null hypothesis is that rank (Π) = 1, 2... and the alternative hypothesis is that rank(Π) = 2, 3, ... until the null hypothesis of an eigen value equal to zero cannot be rejected.

Table 4.5: Results for Rank and Maximum Eigen value Co-integration Tests

Unrestricted Co-integration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.512866	113.5232	95.75366	0.0017
At most 1	0.312487	63.89731	69.81889	0.1355
At most 2	0.264191	38.04475	47.85613	0.3001
At most 3	0.157273	16.87659	29.79707	0.6492
At most 4	0.048909	5.069840	15.49471	0.8014
At most 5	0.023061	1.609809	3.841466	0.2045
Trace test indicates 1 co-integrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Unrestricted Co-integration Rank Test (Maximum Eigen-value)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigen-value	Statistic	Critical Value	Prob.**
None *	0.512866	49.62590	40.07757	0.0032
At most 1	0.312487	25.85256	33.87687	0.3298
At most 2	0.264191	21.16815	27.58434	0.2662
At most 3	0.157273	11.80675	21.13162	0.5669
At most 4	0.048909	3.460031	14.26460	0.9115
At most 5	0.023061	1.609809	3.841466	0.2045
Max-eigen-value test indicates 1 co-integrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Author 2015

According to the test results above, the maximum eigen value indicate at least one co-integrating factor. The trace test also indicates 1 co-integrating factor. We therefore reject the null hypothesis of no co-integration.

Tests for Parameter Stability and Structural Breaks

From figure 4.1 above some structural breaks are evident in the fluctuations observed in exports especially in the years 1997 and 2003 data. For this we use the Bai peron test which basically tests whether the single regression line or the two separate regression lines fit the data best.

We use an f-test to determine whether a single regression is more efficient than two separate regressions involving splitting the data into two or more sub-samples. This could occur as follows, where in the second case we have a structural break at t:

In the first case we have just a single regression line to fit the data points (scatterplot), it can be expressed as:

$$y_t = \alpha_0 + \alpha_1 x_t + u_t \quad \text{.. (6)}$$

In the second case, where there is a structural break, we have two or more separate models, expressed as:

$$\begin{aligned} y_t &= \beta_1 + \beta_2 x_t + u_{1t} \\ y_t &= \delta_1 + \delta_2 x_t + u_{2t} \end{aligned} \quad \text{.. (7)}$$

This suggests that model 1 applies before the break at time t, then model 2 applies after the structural break. If the parameters in the above models are the same, i.e. $\beta_1 = \delta_1, \beta_2 = \delta_2$, then models 1 and 2 can be expressed as a single model as in case 1, where there is a single regression line.

Tests for parameter instability and structural breaks in the models was done using the Bai-Perron test. The Bai -Perron test provided theoretical and computational results allowing for multiple unknown breakpoints (Table 4.6).

Table 4.6: Results Showing Structural Breaks

BAI-PERRON MULTIPLE BREAKPOINT TEST

breaking variables*: lnr_fruitsveges lnfdi lncpi lnneer c*

non-breaking variables*: tbt_fv sps_fv*

Break Test	F-statistic	Scaled F-statistic	Critical Value**
0 vs. 1 *	9.313949	46.56974	18.23
1 vs. 2 *	20.51881	102.5941	19.91
2 vs. 3 *	37.27587	186.3793	20.99
3 vs. 4 *	22.00709	110.0355	21.71
4 vs. 5	1.373369	6.866847	22.37

* Significant at the 0.05 level.

** Bai-Perron (Econometric Journal, 2003) critical values.

Break dates:

	Sequential
1	2004Q2
2	2000Q3
3	1997Q3
4	2007Q2

Source: Author 2015

The sequential test results in able 4.6 above indicate that there are four breakpoints: we reject the nulls of 0, 1, 2 and 3 breakpoints in favour of the alternatives of 1, 2, 3 and 4 breakpoints, but the test of 5 versus 4 breakpoints does not reject the null. This test shows that there are structural breaks in 2004Q3, 2000Q3, 1997Q3 and 2007Q2. We proceed to model the dummies iteratively starting with the most significant, we start by assigning a dummy variable at 2004Q4 where the binary variable takes 1 at break point and zero otherwise, the iterative process reveals that the rest of the breaks are not significant after capturing period 2004. Hence the subsequent equations will have a dummy variable known as D2004. The results are consistent with other stability diagnostics tests.

Granger Causality Tests

Another essential step is testing for Granger causality among the variables. The causality test was first done using the first difference version of the variables. According to Granger (1988), the co-integration between two or more variables is sufficient to demonstrate the presence of causality in at least one direction (Granger, 1988). However co-integration does not indicate the direction of causality between variables. Hence, the causality test is used to verify the direction of causality between variables. A prerequisite for a causality test is a check for co-integration as already done above. We employed the vector auto regression (VAR) technique and regressed on its own lags and the lag of other variables. From the above results we can see the existence of long term equilibrium relationship between horticulture exports and FDI There is no evidence to suggest any causality between the other variables.

The hypothesis being tested is H_0*:*$b_1=b_2$`.....=b_p*=0 Against* H_A*:not* H_0 *i.e X does not Granger cause Y ……..AND*

H_0*:*$d_1=d_2$`.....=d_p*=0 Against* H_A*:not* H_0 *i.e Y does not Granger cause X*

Rejecting the null hypothesis in each case implies that there is Granger Causality

Table 4.7: Summary Results Granger Causality Tests

Dependent variable	Independent variable (F-statistics)			T-Statistics
	Δ*ln HORTEXP*	Δ*ln FDI*	Δ*ln GDP*	ECT_{t-1}
Δ*ln* HORTEXP	-	0.1028	4.8751**	1.6742**
Δ*ln FDI*	1.2098	-	0.8432	-0.3421
Δ*ln GDP*	1.0032	2.332**	-	1.7641**

** Significance at 5% level (The results in table 4.7 above only report variables that are significant in terms of granger causality)

Source: Author 2015

4.4.3 Estimation of Long Run and Error Correction Model*s* (ECM)

From the diagnostic tests in the previous section, we found that the variables are non-stationary and integrated. When variables are non-stationary but co-integrated a long run co-integrating model can be estimated with variables. We use a two-step process involving first, the estimation of a long run equation and the second step which involves an ECM. Results are summarized in table 4.8 and 4.9 below.

Table 4.8: Horticulture Exports Co-integrating Model

Dependent Variable: LNT_HORT_EXP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNT_HORT_EXP(-1)	1.127191	0.147150	7.660133	0.0000
LNT_HORT_EXP(-2)	0.157038	0.216177	-0.726430	0.4714
LNT_HORT_EXP(-3)	0.251049	0.131824	-1.904422	0.0634
LNGDP_P	0.211518	0.161508	1.309647	0.1971
LNGDP_P(-3)	0.125653	0.068059	1.846240	0.0716
LNREER	-0.297955	0.739476	-0.402926	0.6890
LNREER(-3)	-1.365287	0.844010	1.617619	0.1129
LNCPI	-1.830979	1.285814	-1.423985	0.1615
LNCPI-(1)	-3.110646	1.410286	2.205684	0.0327
LNCPI(-3)	-1.801772	0.800277	-2.251437	0.0294
LNFDI(-3)	0.008469	0.024478	0.345979	0.7310
LNTREJECTIONS	-0.099188	0.056690	-1.749646	0.0872
LNTREJECTIONS(-1)	-0.066073	0.056223	-1.175208	0.2462
SPS_FV	-0.037268	0.064186	-0.580626	0.5645
TBT_FV	-0.014043	0.070430	-0.199393	0.8429
Dummy 2004	-0.020888	0.091930	-2.227219	0.0813
C	4.484174	2.087135	2.148483	0.0372
R-squared	0.944726	Mean dependent var		21.98262
Adjusted R-squared	0.922114	S.D. dependent var		0.647912
S.E. of regression	0.180820	Akaike info criterion		-0.338405
Sum squared resid	1.438611	Schwarz criterion		0.307937
Log likelihood	29.65976	Hannan-Quinn criter.		-0.084196
F-statistic	41.77982	Durbin-Watson stat		2.173427
Prob(F-statistic)	0.000000			

Source: Author 2015

The autoregressive distribution lagged (ARDL) model estimated above has an R-squared 0.94 revealing that the model explains 94% of the variations in total horticultural exports. Total horticultural exports for present period are significantly affected by past exports showing that the variable has inertia. Per-capita income positively and significantly affects horticultural exports after three quarters. Total rejections of horticultural products negatively affects total horticultural exports significantly at 5% level in the current period. Notably, inflation negatively affects the total exports at 5% significance level.

The short run model below shows a ECT coefficient of -0.957748 which is significant at all the conventional levels of measurement. This confirms co-integration and also shows that 95% of disequilibrium is cleared in each quarter.

Horticulture Export Error Correction Model (ECM)

This model is constructed following general to specific approach. It consisted of specifying a general model that was general enough that the error terms are homoscedastic. Once this is achieved then we proceeded to eliminate the insignificant variables, while at each step checking that the error terms are white noise and homoscedastic. This process continued until variables could not be eliminated (Table 4.9).

Table 4.9: Results of the Error Correction Model for Horticulture

Dependent Variable: DLNFR_VEG_EXP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLNFR_VEG_EXP(-1)	1.401959	0.322164	4.351699	0.0001
DLNFR_VEG_EXP(-2)	-0.492420	0.203624	-2.418283	0.0211
DLNFR_VEG_EXP(-3)	0.152429	0.138852	1.097783	0.2800
DLNFR_VEG_EXP(-4)	-0.133601	0.138805	-0.962512	0.3426
DLNFR_VEG_EXP(-5)	0.155199	0.138062	1.124118	0.2688
DLNGDP_P(-1)	-0.029025	0.065620	-0.442325	0.6611
DLNGDP_P(-2)	-0.124829	0.063796	-1.956696	0.0586
DLNGDP_P(-3)	0.100780	0.064957	1.551482	0.1300
DLNGDP_P(-4)	0.083082	0.070136	1.184582	0.2444
DLNGDP_P(-5)	-0.031687	0.064892	-0.488306	0.6285
DLNREER	1.899256	1.071601	1.772354	0.0853
DLNREER(-1)	-1.222169	1.166358	-1.047851	0.3021
DLNREER(-3)	-1.105204	1.232563	-0.896671	0.3762
DLNREER(-4)	-1.962386	2.713375	-0.723227	0.4745
DLNREER(-5)	3.161333	2.670813	1.183660	0.2448
DLNCPI	-0.486380	1.039945	-0.467698	0.6430
DLNCPI(-1)	-1.491979	1.013233	-1.472492	0.1501
DLNCPI(-2)	1.846999	1.022865	1.805712	0.0798
DLNCPI(-3)	-2.740225	1.146325	-2.390442	0.0225
DLNCPI(-4)	0.460017	1.070437	0.429746	0.6701
DLNCPI(-5)	-2.405666	1.032462	-2.330028	0.0259
DLNFDI	0.018249	0.019897	0.917150	0.3655
DLNFDI(-3)	-0.018979	0.019965	-0.950574	0.3485
DLNFDI(-4)	-0.011244	0.019819	-0.567309	0.5742
DLNFDI(-5)	0.011846	0.019057	0.621612	0.5383

DLNREJECTIONS	-0.082742	0.034450	-2.401807	0.0219
DLNREJECTIONS(-1)	-0.056548	0.036541	-1.547527	0.1310
DLNREJECTIONS(-4)	0.038266	0.029427	1.300375	0.2022
SPS_FV	-0.072501	0.045733	-1.585300	0.1222
TBT_FV	-0.013247	0.049532	-0.267448	0.7907
ECT(-1)	-0.957748	0.272703	-3.512054	0.0013
C	0.149047	0.059131	2.520640	0.0166
R-squared	0.759935	Mean dependent var		0.025870
Adjusted R-squared	0.541053	S.D. dependent var		0.178090
S.E. of regression	0.120648	Akaike info criterion		-1.085474
Sum squared resid	0.494903	Schwarz criterion		-0.023823
Log likelihood	67.82064	Hannan-Quinn criter.		-0.665965
F-statistic	3.471884	Durbin-Watson stat		2.413377
Prob(F-statistic)	0.000281			

Source: Author 2015

Table 4.10: Flower Export Co-integrating Model

Dependent Variable: LNE_FLOWERS				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNE_FLOWERS(-1)	1.034859	0.144710	7.151250	0.0000
LNE_FLOWERS(-4)	0.161624	0.086892	-1.860059	0.0696
LNGDP_P	0.260518	0.395859	0.658107	0.5139
LNREER(-4)	1.738682	0.943249	1.843290	0.0720
LNCPI(-2)	3.392077	1.944494	1.744452	0.0881
LNFDI	0.034083	0.041795	0.815490	0.4192
LNFDI(-1)	-0.036299	0.041477	-0.875155	0.3862
LNTREJECTIONS	-0.118997	0.069904	-1.702292	0.0958
SPS_FV	-0.102161	0.084621	-1.207268	0.2338
TBT_FV	0.017651	0.092103	0.191643	0.8489
Dummy 2004	0.011885	0.121462	2.097848	0.0240
C	1.719458	1.958444	0.877971	0.3847
R-squared	0.940576	Mean dependent var		21.29304
Adjusted R-squared	0.913565	S.D. dependent var		0.819556
S.E. of regression	0.240948	Akaike info criterion		0.247486
Sum squared resid	2.554465	Schwarz criterion		0.949981
Log likelihood	12.95669	Hannan-Quinn criter.		0.524665
F-statistic	34.82199	Durbin-Watson stat		2.098436
Prob(F-statistic)	0.000000			

Source: Author 2015

The ARDL model in table 4.10 above explains 91% of the variations 0f flower exports. Flower exports seem to have inertia in the sense that the lagged variable is significant at 5% and 10% significant levels. The total rejected flowers negatively affects total exports significantly at 1% level with a per centage increase in rejections lowering exports by 0.11%. The short run model is well behaved with ECT term being negative and significant at all conventional levels. This confirms that 85% of disequilibrium is cleared quarterly.

Table 4.11: Results of Flower Export Error Correction Model

Dependent Variable: DLNE_FLOWERS				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLNE_FLOWERS(-1)	0.950367	0.210278	4.519585	0.0001
DLNE_FLOWERS(-2)	-0.287968	0.147996	-1.945781	0.0589
DLNE_FLOWERS(-3)	-0.071819	0.121191	-0.592611	0.5569
DLNGDP_P(-1)	-0.185986	0.115477	-1.610592	0.1153
DLNGDP_P(-2)	-0.133726	0.118271	-1.130682	0.2651
DLNGDP_P(-3)	0.039690	0.116209	0.341543	0.7345
DLNGDP_P(-4)	0.057633	0.115940	0.497098	0.6219
DLNREER	2.706094	1.940819	1.394305	0.1711
DLNREER(-1)	-1.576164	2.077659	-0.758625	0.4526
DLNREER(-3)	-1.465463	2.117974	-0.691917	0.4931
DLNREER(-4)	-6.659784	4.616855	-1.442494	0.1571
DLNREER(-5)	9.175519	4.480168	2.048030	0.0473
DLNCPI	-1.889953	1.610228	-1.173718	0.2476
DLNCPI(-1)	-2.865145	1.767867	-1.620679	0.1131
DLNCPI(-2)	2.429217	1.805478	1.345470	0.1862
DLNCPI(-3)	-3.783836	1.992996	-1.898567	0.0650
DLNCPI(-4)	2.418461	1.772588	1.364367	0.1803
DLNCPI(-5)	-4.028383	1.646066	-2.447279	0.0190
DLNFDI	0.044809	0.035399	1.265823	0.2131
DLNFDI(-5)	0.048734	0.035253	1.382407	0.1747
DLNREJECTIONS	-0.103701	0.064285	-1.613135	0.1148
DLNREJECTIONS(-1)	-0.107250	0.066335	-1.616796	0.1140
DLNREJECTIONS(-4)	0.075756	0.052718	1.437003	0.1587
SPS_FV	-0.193531	0.076188	-2.540185	0.0152
TBT_FV	-0.040194	0.083371	-0.482108	0.6324
ECTF(-1)	-0.811387	0.270178	-3.003152	0.0046
C	0.309975	0.107165	2.892506	0.0062

R-squared	0.660895	Mean dependent var	0.049071
Adjusted R-squared	0.434826	S.D. dependent var	0.296478
S.E. of regression	0.222886	Akaike info criterion	0.127780
Sum squared resid	1.937456	Schwarz criterion	1.023548
Log likelihood	22.78327	Hannan-Quinn criter.	0.481740
F-statistic	2.923413	Durbin-Watson stat	1.710614
Prob(F-statistic)	0.001209		

Table 4.12: Fruits and Vegetables Co-integrating Model

Dependent Variable: LNFR_VEG_EXP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNFR_VEG_EXP(-1)	1.208569	0.122507	9.865315	0.0000
LNFR_VEG_EXP(-2)	0.312823	0.126319	-2.476440	0.0165
LNGDP_P	-0.085440	0.041548	-2.056430	0.0447
LNREER	0.275955	0.268806	1.026592	0.3093
LNCPI	-0.588104	0.571850	-1.028423	0.3084
LNCPI(-2)	1.383857	1.026084	1.348678	0.1832
LNCPI(-3)	-0.828418	0.889150	-0.931697	0.3557
LNFDI	-0.004622	0.015824	-0.292091	0.7714
LNTREJECTIONS(-3)	0.093660	0.040681	2.302314	0.0253
LNTREJECTIONS(-4)	0.093630	0.037268	2.512368	0.0151
Dummy2004	-0.005703	0.067919	-2.083974	0.0210
TBT_FV	0.001386	0.048716	0.028458	0.9774
SPS_FV	-0.007152	0.043457	-0.164581	0.8699
C	0.211004	1.144507	0.184362	0.8544
R-squared	0.939769	Mean dependent var		21.35544
Adjusted R-squared	0.924996	S.D. dependent var		0.502817
S.E. of regression	0.137706	Akaike info criterion		-0.943877
Sum squared resid	1.005041	Schwarz criterion		-0.483195
Log likelihood	45.61987	Hannan-Quinn criter.		-0.761584
F-statistic	63.61134	Durbin-Watson stat		2.132952
Prob(F-statistic)	0.000000			

Source: Author 2015

The model above explains 93.9% of the variation in fruits and vegetable exports. As earlier observed, horticultural exports have an inertial in the sense that the current level of exports is significantly affected by previous exports. This trend is common in agricultural production where there is a lagged response in output to current market prospects. Total rejections persistently and significantly affect exports of fruits and vegetables at 5% level. The persistence seems significant in third and the fourth quarter.

Table 4.13: Fruits and Vegetables Error Correction Model

Dependent Variable: DLNFR_VEG_EXP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLNFR_VEG_EXP(-1)	0.769074	0.166427	4.621098	0.0000
DLNFR_VEG_EXP(-2)	-0.129226	0.138909	-0.930289	0.3579
DLNFR_VEG_EXP(-3)	0.067049	0.124491	0.538582	0.5932
DLNGDP_P(-1)	-0.047659	0.064449	-0.739483	0.4640
DLNGDP_P(-2)	-0.160860	0.066821	-2.407329	0.0209
DLNGDP_P(-3)	0.126260	0.065342	1.932285	0.0606
DLNGDP_P(-4)	0.083484	0.066975	1.246497	0.2200
DLNREER	1.612574	1.078147	1.495690	0.1428
DLNREER(-1)	-0.753201	1.149050	-0.655499	0.5160
DLNREER(-3)	-0.988075	1.164569	-0.848447	0.4014
DLNREER(-4)	-2.299919	2.565335	-0.896537	0.3755
DLNREER(-5)	4.297762	2.505660	1.715222	0.0942
DLNCPI	-1.265030	0.931540	-1.358000	0.1823
DLNCPI(-1)	-1.368344	0.999662	-1.368806	0.1789
DLNCPI(-2)	2.236558	1.004404	2.226750	0.0318
DLNCPI(-3)	-2.471988	1.158379	-2.134005	0.0392
DLNCPI(-4)	1.555174	0.966315	1.609386	0.1156
DLNCPI(-5)	-2.259118	0.920474	-2.454298	0.0187
DLNFDI	0.026773	0.019556	1.369044	0.1788
DLNFDI(-5)	0.024545	0.019162	1.280927	0.2078
DLNREJECTIONS	-0.104396	0.035093	-2.974857	0.0050
DLNREJECTIONS(-1)	-0.095160	0.034808	-2.733840	0.0094
DLNREJECTIONS(-4)	0.032984	0.029212	1.129131	0.2657
SPS_FV	-0.141087	0.040911	-3.448636	0.0014
TBT_FV	-0.009661	0.048380	-0.199695	0.8428
ECTF(-1)	-0.343667	0.116852	-2.941053	0.0055
C	0.165184	0.059796	2.762473	0.0087
R-squared	0.713208	Mean dependent var		0.025870
Adjusted R-squared	0.522013	S.D. dependent var		0.178090
S.E. of regression	0.123125	Akaike info criterion		-1.059139
Sum squared resid	0.591234	Schwarz criterion		-0.163372
Log likelihood	61.95160	Hannan-Quinn criter.		-0.705179
F-statistic	3.730263	Durbin-Watson stat		2.351241
Prob(F-statistic)	0.000106			

Source: Author 2015

4.4.4 Impulse Response Functions

Unrestricted vector auto regressions (VARs) allow feedback and dynamic interrelationship across all the variables in the system and it's highly competitive with the large-scale macro econometric models in forecasting and policy analysis. The unrestricted VARs model assumes that each and every variable in the system is endogenous and does not impose any a-priori causality restrictions among the variables.

A VAR model allows the variables to interact with each other and themselves too without imposing a theoretical structure on the estimates. Variance decompositions (VDCs) and impulse response functions (IRFs) are the major tools found in VAR tool kit. VDCs reflect the portion of the variance in the forecast error for each variable due to innovations to all variables in the system while IRFs show the response of each variable in the system to shock from system variables. It traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables

The bench mark reduced VAR model can be written as

$$X_t = a_0 + A_1 X_{t-1} + B^{-1} e_t \quad \text{.....(6)}$$

However the reduced form disturbances are generally known to be correlated hence it is necessary to transform the reduced form model into a structural form model. This is known as VAR identification process. This study relied on recursive identification scheme which entails that the ordering of the variables according to contemporaneousness. The VAR model is a vector natural logarithm of total Horticultural exports (LNt_HORT_EXP), Gross domestic product (LN GDP), export of flowers (LNE_flowers), effective exchange rate (LN_NEER), consumer price index(LNCPI) ,foreign direct investments (LNFDI) and total horticultural rejections(LNT REJECTIONS).

Impulse Responses

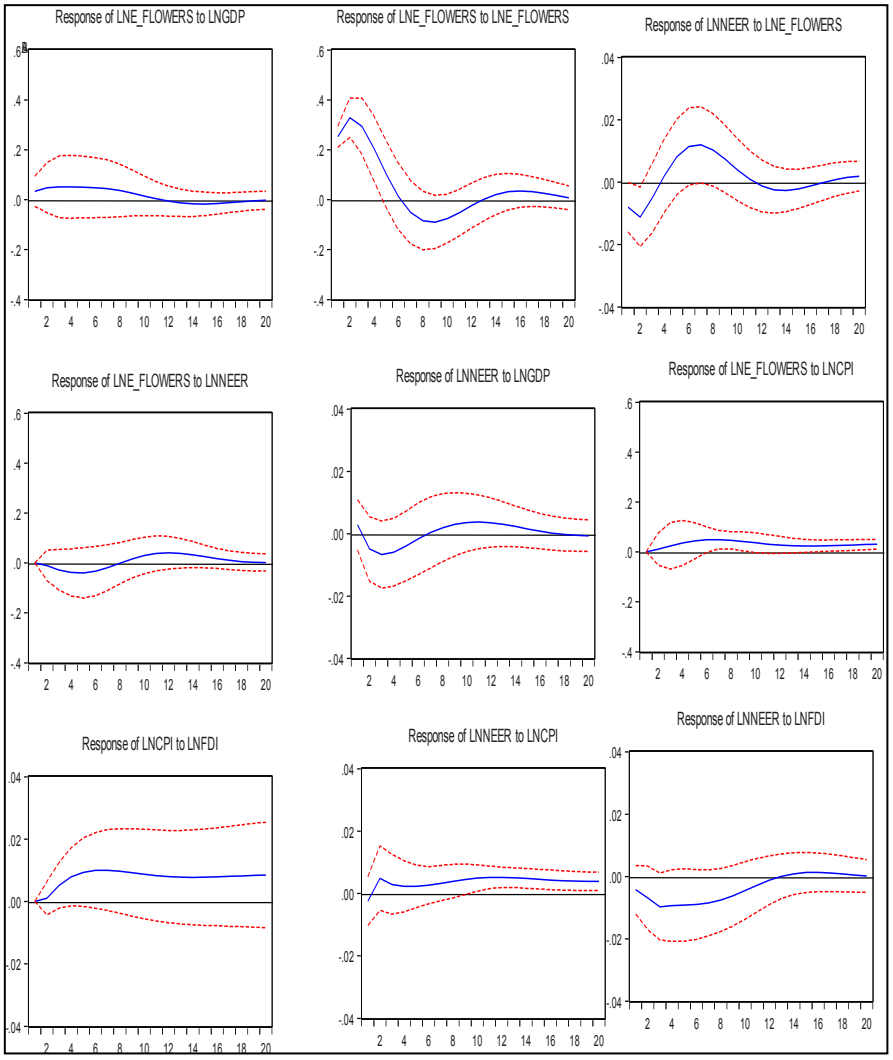
Impulse responses trace out the response of current and future values of each of the variables to a one-unit increase (or to a one-standard deviation increase, when the scale matters) in the current value of one of the VAR errors, assuming that this error returns to zero in subsequent periods and that all other errors are equal to zero. Impulse response functions (IRFs) show the dynamic behaviour of a variable as

given by its time path in response to exogenous random shocks given to this and other variables. This implies that it is possible to identify the pass through effects of shocks on variables. Panel A, B and C illustrates the impulse response functions (IRFs) of the VAR model for a period of 20 quarters forecast horizon. The vertical axis shows the magnitude of a shock while the horizontal axis shows the time path of the responding variable.

Each panel depicts the dynamic effect of a one standard deviation innovation on each of the variables of interest. The broken red line shows the 95% confidence interval generated by 1000 Monte Carlo simulations while the bold blue line shows the impulse response function of one variable due to innovation in other variable. A response is considered significant if it doesn't contain the zero line or the horizontal bench mark line within its confidence bands.

In panel a shock in flower production (a sudden raise in flower production) remains significant in the market for four quarters before the stability is resumed. However a shock in economic performance marked by sudden raise in GDP seems not to have any significant effect on flowers production. This can be explained by the fact that agricultural production of flowers seems to be driven by exogenous factors rather than domestic economic performance. On the other hand, most of the flowers produced are for exports hence domestic economic performance may not have an effect on flowers production. A similar argument is supported by the evidence that foreign direct inflows have no effect on flower production.

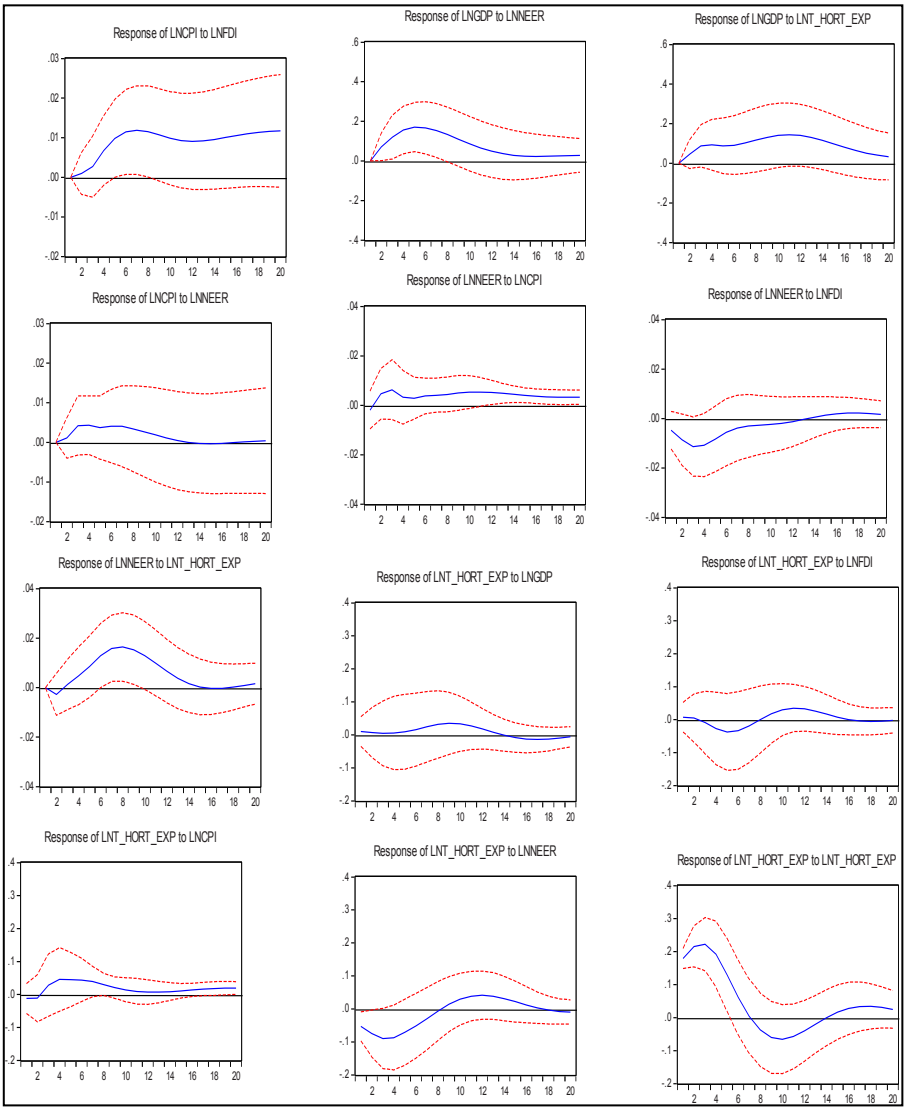
Notably, a raise in flower production has an appreciating effect on exchange rate with the effect lasting for three quarters. Kenya majorly being an exporter of agricultural products, exchange rate seems to fluctuate in tandem with agricultural exports. On the other hand, consumer price index shock weakens exchange rate for 10 quarters. Domestic inflation raises the level of imports hence the exchange rate depreciates. However, depreciation has a positive but lagged effect on flower production since it is associated with high returns for exporters. The lagged effect is explained by the gestation period required for agricultural sector to respond to market dynamics.



PANEL A

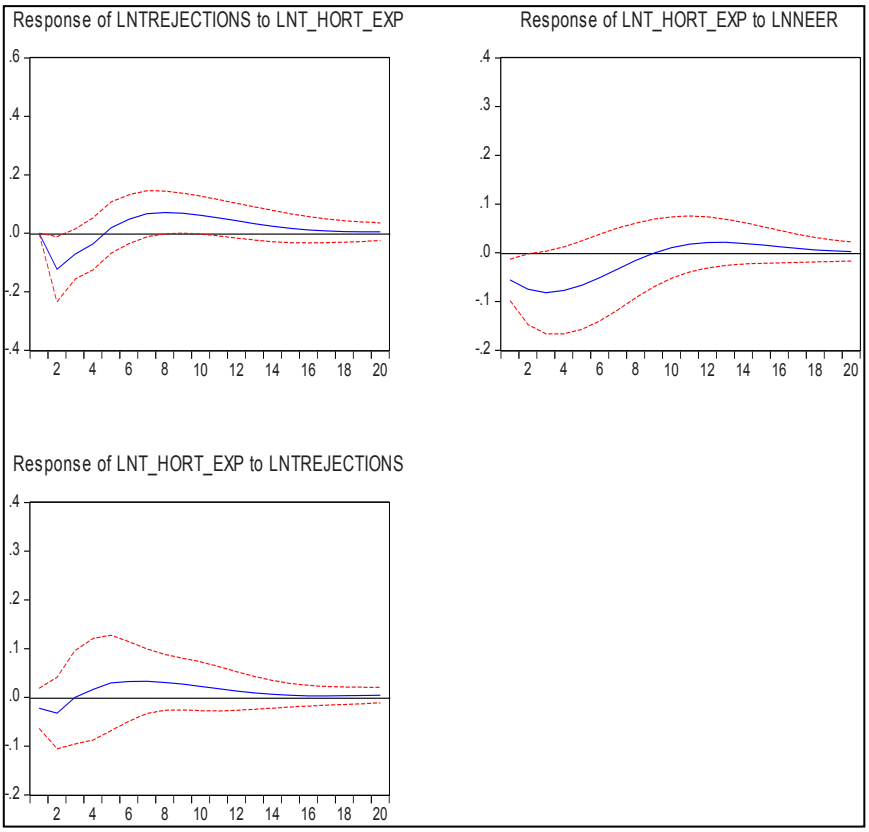
In panel B below, foreign direct investments has a significant effect on consumer price index. These can be explained by the fact that investments are a component of aggregate demand. Based on aggregate demand- aggregate supply model, it is expected that a raise in

investment will raise price level. However, FDI flows have no effect on the total export of horticultural products. It is also notable that total export of horticultural makes the exchange rate to appreciate. Depreciation lowers agricultural output in the first quarter perhaps due to raise in imported inputs but the output rises in the longer horizon. Again, depreciation raises GDP significantly in the 4th quarter perhaps through the exports channel but the effect is not permanent because the shock dies in the 8th quarter.



PANEL B

In panel c below, rejection of horticultural exports does not reduce production. On the other hand, increase in horticultural production does not increase the level of rejected exports.


Response of LNTREJECTIONS to LNT_HORT_EXP
Response of LNT_HORT_EXP to LNNEER
Response of LNT_HORT_EXP to LNTREJECTIONS

PANEL C

4.6 Conclusion

The horticulture sector is one of the 'success stories' of the Kenyan export economy. It represents over 33 per cent of total exports and 15 per cent of agricultural GDP. This sector is therefore critical for the country's growth and development. This paper analyses the effects of standards on exports in view of other factors that affect export supply; it attempts to answer the fundamental question, *to what extent do standards affect export supply*? Findings from the study contribute to a very important policy debate on standards and developing country exports. An empirical model is specified along the standard trade models that incorporate real exchange rate, per capita income, CPI all which appear to impact on exports. An error correction formulation is used to distinguish between the long run and short-run elasticity. Results from this study indicate that the error correction term in the model is found to be statistically significant, confirming the validity of the long-run equilibrium relationship. In the short-run, real exchange rate and per capita income have profound influences on export performance including flower and fresh fruits and vegetables exports.

The structural break is observed to have a negative influence on horticulture exports and those of fresh fruits and vegetables but not those of flowers. The structural breaks occurred in the years after various rules and regulations we introduced or made tighter for instance the most significant break in 2004 was mainly due to the introduction of EUREPGAP and stricter EU regulations including harmonization of EU standards with WTO standards in the year 2003.

Standards do affect exports in a negative way. The effect of rejections is pronounced both in the long and short run and for the three categories i.e. total horticultural exports, cut flowers and fresh fruits and vegetable exports. SPS measures have a negative and significant relationship for horticulture exports and for both cut flower and fruits and vegetable exports in the short run. In the long run, the effects of SPS measures are not significant. TBT measures are also found not to be significant to any of the export categories in the long and short run. In conclusion, the study shows that supply response for horticulture is mainly influenced by variables such as GDP per capita, exchange rates

and FDI. Standards, specifically SPS measures also affect supply response of horticultural produce and in the short and long run. Looking

at the impulse response functions we can conclude that exchange rates do affect export volumes as depreciation lowers agricultural output ie exports in the first quarter.

From this chapter we can therefore conclude that as much as standards may affect exports in the long and short run, other macro-economic variables such as real exchange rate, inflation and per capita income are also significant in determining the supply response of exports. From a development perspective, it is important to have sound macro-economic policy for export growth and for these exports to contribute to meaningful development. The next sections of this research dissertation will examine the specific value chain effects of standards on different actors to determine who are the losers and the winners in a globalized value chain and the last section will examine the participation of smallholders in these value chains as direct beneficiaries of these exports.

5 Understanding the Distributional Effects of Standards: An Analysis of Kenya's Green Beans Value Chain

5.1 Introduction

The high value fresh produce sector in many developing countries is a recently emerging non-traditional export commodity sector consisting of a number of key players including producers, farmers (large and small-scale), exporters and distributors, traders and retailers. These retailers are governed by standards and have reorganized their supply/value chains around notions of traceability, food safety, and quality assurance. Some authors, particularly in the economic geography 'school of thought', have established a link between the roles of standards in shaping the governance structures of high value chains (Graffham et al. 2007, Nielsen 2008, Lazaro *et al.* 2010, Ouma 2010).

The governance of global chains is a crucial element for efficiency and distributional effects - including for growth and food security. The chain governance itself is endogenous in an environment of weak contract enforcement and imperfect markets, and importantly, depends on the value in the chain (and on other commodity characteristics). The supply chain governance – or the way economic transactions in supply chains are coordinated (Gereffi et al. 2005) – are crucial in determining how economic surpluses are generated and distributed along the chain. There is large variation in how food and agricultural commodity chains are governed, with the involvement of the public sector and/or different private agents and the varying levels of vertical coordination between those actors. It has been argued and empirically demonstrated that the degree of vertical coordination in supply chains indeed influences economic outcomes, in particular efficiency and equity (Swinnen & Maertens 2007) this is often because large and often multinational companies are extracting the entire surplus through their bargaining power within the chains.

There is an emerging body of literature that analyzes the distribution of gains along value chains. This literature can be broadly divided into 3 strands - the first focuses on the uneven geographical incidence of price

variations among major players in the chains as product becomes more differentiated (Fitter & Kaplinsky 2004, Kaplinsky 2004, Gilbert 2006, Swinnen & Maertens, 2007). A common finding in these studies is that a larger share of the retail price is retained by retailers and processors (who have the monopoly and oligopoly powers in the chains) rather than by producers. The second strand of literature concentrates on the distribution of costs and margins but without linking it to any particular form of governance structures in value chains (Nyeko 2004, Shiferaw & Hailemariam, 2007) and again the findings indicate a skewed distribution in favour of retailers and processors. The third strand of literature looks at the impact of standards on the distributive outcomes of value chains albeit without linking it to any form of governance in the value chain (Sexsmith & Potts 2010, Valkila et al. 2010, Kilian et al. 2005). These studies indicate that a bigger share of the income is being generated at the retailer end and the chief beneficiaries of premiums accrued due to compliance with standards are mainly retailers and processors. Pertinent questions therefore remain about how standards influence the governance structures in value chains and how these influence the distribution of costs, margins and value added among various stakeholders of the value chains.

In the course of globalization, there has been a perception that the gap in incomes within and between countries has increased. In essence firms and countries are globally interlinked in a global value chain and therefore gaps in incomes within firms may in turn reflect to some extent global inequalities (Kaplinsky 1999, Gibbon & Ponte 2005). Global Value Chain (GVC) analysis is hence used to show how firms, regions and countries are linked to the global economy and how this largely determines how incomes are distributed. In this context value chain analysis is used as a tool which can provide insights into issues related to global income distribution. Kaplinsky (2000) and Humprey (1999) therefore give three components of value chains which form the basis of this chapter's analytical underpinnings: (1) Value chains are repositories for rent and these rents are dynamic, (2) Effectively functioning value chains need some degree of governance and (3) Effective value chains arise from systemic rather than point efficiency.

Drawing from some fundamental insights of the GVC, and of the international trade literature on transaction cost economics, this chapter attempts to investigate the patterns of governance arising in value

chains in which standards are the key critical success factors and how standards shape the governance of these chains. In addition to this, we analyse the resultant distributive effects on different sets of players – producers differentiated by type (large and small scale) exporters and retailers, with specific reference to the Kenya green beans value chain. This paper introduces two main original contributions. First, conceptually and empirically, we look at how standards shape the governance structure and the power relationships in the value chain; drawing on previous GVC related work by Gerreffi 1994, and Gerreffi et al. 2005 on different coordination mechanisms of value chains and the ability of standards to codify information and transactions along the value chain. We also draw upon the work of Kaplinsky & Morris 2001 on the governance of value chains and how power relationships influence barriers to entry and rent.

The second original contribution of this chapter is an empirical one in which the distribution of outcomes along the value chain is not only analysed in terms of prices, margins or costs, but also in terms of value added and incomes for different stakeholders – differentiated by their sizes and positions along the value chain. This type of analysis provides an extremely detailed countenance, which not only aims to see the asymmetries in incomes between developing and developed countries but also between the various types of producers and exporters within developing countries. T analysis also establishes the spread of transaction costs along the value chain and among actors and determines whether costs of complying with standards indeed form an integral part of the total costs along the chain and if they in-effect lead to marginalization of some stakeholders.

The green beans value chain is used as a case point of analysis because it presents a high value chain in which global standards of a wide range form an integral element. It has inherent backward and forward linkages with many different types of stakeholders horizontally and vertically and is therefore representative of the many typical high-value chains in developing countries. Furthermore, it is also a sector where production is predominantly carried out by numerous smallholders (at least 70% of production); and is invariably linked to poverty.

5.2 Case Study Design and Methodology

5.2.1 Analytical Framework

The green beans value chain is used to give insight into the dynamics of standards along the value chain from the production level, through to the processing and the exports level. The green beans chain was selected because it gives a complete Meso-level representation of the entire value chain. It is representative of the standards and requirements needed to access EU markets (mandatory and private); the activities (production, processing and exports), the participants (small, medium and large scale producers and exporters).

A value chain[22] approach forms the entry point for analysis of this chapter and incorporates two main features i.e. governance - the way in which standards drive the governance of value chains; and the way in which the resultant governance structure and power relationships influence the distribution of rents and surpluses along the chain. This is put into perspective using a framework, which distinguishes the forms of governance and the rules defining the basis of participation (Gereffi, 1994, Kaplinsky & Morris 2001). The complexity of transactions and standards within the chain determines the coordination mechanism used in the chain, the relationships between various actors and how they use these coordination mechanisms to position themselves in the chain (Gerreffi & Sturgeon, 2003). And finally, power relationships within the chain and how these shape the various forms of governance is also important for this particular analysis.

The second analytical approach provides an enquiry of the physical flow of goods within the value chain and the distribution of costs and margins as well. Likewise, one of basic concepts of GVC analysis is that a complete value chain has different value parts and every part does not give rise to equal value. This is analogous to the *filiere concept* which was applied in the 1970's and encompasses a strong empirical perspective and focused on physical, quantitative and technical aspects. Durufle et al. 1988 use an economic and financial evaluation of *filieres* to analyze income generation and distribution in commodity chains. The same

approach is applied in this chapter, looking not only at the value chains dynamics and power relationships, but also presenting the economics of the *filiere* in terms of distribution of costs and benefits along the value chain.

Shank & Govindarajan (1992) provide a framework for the analysis of transaction costs in a supply chain in stages. The methodology involves a three stage embedded process which begins by mapping the value chain by first identifying the value chain structure/*filiere* at the meso-level including both upstream and downstream participants and their relative (power) positions in the chain. The second stage involves identifying the flow of standards in relation to the chain structure. This is followed by an in-depth analysis of costs and margins along the value chain – using the value chain matrix and accounting methods that determine the spread of costs and the distribution of gains along the *filiere* for the various 'types' of chain participants. The costs of compliance to standards are also analysed for the various actors along the value chain, relative to other cost components along the chain such as inputs, processing, labour, marketing etc; the distribution of margins is also determined for the various actors; and finally the value addition at each stage of is determined and compared with the rent received.

As discussed before, the distribution of rents will be determined along the value chain, using an accounting framework which will allow for the value to be attached at each stage, based on the method by Gilbert (2006) as follows:

Retail price of final product = farm/firm price + gross margin expressed as:

$$p = \pi + m.....(i)$$

The value share therefore becomes:

$\omega = \pi / p$.....(*ii*) Where ω is the firm/farms share of retail price

This can further be decomposed into:

Retail Price = ((commodity price + transport & other export costs/exchange rate) + costs of raw materials+ costs of labor +costs of compliance to standards &

upgrading+ (costs of processing & packaging+ processing margin)+ advertising costs+ retail costs margin+ sales or value added tax))

This decomposition will be done for various segments of the value chain in order to determine each segment's share of the retail price versus its share of the value added. This will form an accounting matrix for the entire value chain.

5.2.2 Data

This information has been obtained from two key sources: the survey carried out between February and May 2009 and key respondents in each link of the chain interviewed between July and October 2009. The survey comprised of horticultural farmers in 5 provinces over 9 districts (Appendix 1 in Chapter 1). The sample consisted of 201 large, medium and smallholder respondents with farm sizes ranging from 5000 acres to .25 of an acre and having different characteristics. The survey is augmented with information from 18 key informants from the Horticultural Crops Development Authority (HCDA) and the Ministry of Agriculture, Fresh Produce Exporters Association of Kenya (FPEAK); producer organizations and other institutions (Summary Appendix 2 Chapter 1). For this particular chapter, the green beans value chain is used to analyse and illustrate the distributional effects of standards. Out of the 201 farmers, 62 farmers grew green beans, 12 were medium scale farmers, and 1 large scale farmer with an integrated pack house.

Value chain actors from the green beans chain were selected on the basis that they are representative of the value chain 'categories' of actors at each stage of production, processing and exports. The key value chain actors in this case are: (i) production/farming- consisting of three main categories of actors – large scale producer, individual, small-medium scale farmer, and small holder farmer under group certification (ii) Processing, packaging and exporting consisting of large scale integrated producer/exporter, and brief case exporters (Figure 5.1) (iii) Importers – mainly supermarket chains. The value chain actors have different characteristics in terms of the size of farms, activities, costs and profit margins. Table 5.1 below gives a summary of the characteristics of selected value chain actors.

The standards taken into consideration here are mainly those that are predominant in the green beans value chain and are mandatory, these are- GLOBALGAP, Maximum residue limits, and HACCP/ISO.

Table 5.1: Summary Profiles of Green Beans Farmers used in this analysis

Variable	*Large-Scale Integrated Farmer/Exporter*	*Individual Small-Medium Scale Farmer*	*Smallholder Under Group Certification*	*Briefcase Exporter*
Total Land Holdings (acres)	5000	12	4.8	-
Area Under Green Beans (acres)	620	5	1	-
No of employees				
Permanent	600	2	-	20
Casual	4500	5	4	200
Family Labour	-	1	3	
Distance From Tarmac Road (Km)	<1	8	6.5	<1
Distance From Airport(Km)	98	143	121	3
Contract	Yes	Yes	No	Yes
Belongs to a Producer Organization	Yes	No	Yes	Yes

Source: Survey results 2009

Data on Prices were obtained from 12 different supermarkets in five countries that comprise the main export destinations for Kenya's green beans in the EU i.e UK, Netherlands, Belgium, Germany and France (summary table 5.2). For computation and cost accounting purposes, the average price was calculated.

Table 5.2: Summary Green Beans Prices in 2009

Country	*Supermarket*	*Price in Euros*	*Price in Euros*	*Average price*
		Fine	Extra Fine (X-fine)	
Belgium	DelHaize	9	10.2	9.6
	Spar	9.6	10.8	10.2
	Lidl	8.7	-	8.7
Netherlands	Alberthijn	8.3	9.23	8.765
	Aldi	8.8	-	8.8
	Spar	9.58	10.9	10.24
	C1000	9.25	10.6	9.925
United Kingdom	Birmingham market	8	-	8
	Aldi	8.7	-	8.7
	ASDA	8.73	9.7	9.215
	Waitrose	9.6	10.2	9.9
	Tesco	9.5	10.24	9.87
	Lidl	8.68	-	8.68
	Sainsbury's	9.5	10.15	9.825
	Morrisons	9.18	9.98	9.58
EU Average				9.3333

Source: Survey Results, 2009

Cost Accounting Computation of Revenues, Margins and Return on Investments

Cost components for smallholder farmers are identified as: variable costs for seed; fertilizer; spraying; weeding; harvesting, sorting and grading; land preparation and costs for auditing, testing and certification. Fixed costs are also identified as costs related to putting up equipment and infrastructure required to meet standards. Briefcase exporters and large scale integrated exporters have their cost components defined as: fixed cots comprising initial investments costs and infrastructure for standardization, pack houses and licensing. Their variable costs for labour, water, electricity, auditing, testing and certification, transport, air freight, packaging and labelling, monitoring and enforcement, and taxes.

(i) The per centage costs for each component is then calculated as: (cost component/total cost)*100 where *total cost is fixed cost+ variable costs.*

(ii) The per cent variable costs are expressed as: *(variable costs/total costs)*100*

(iii) The per cent investment costs determined by : (*investment costs/total costs)*100*

*(iv)*Unit variable costs expressed as: *(variable costs/total output)*

(v) Unit total costs expressed as: *(total costs/total output)*

*(vi)*Gross margin: *(revenue-total costs)*

(vii) Unit profit: *(Revenue-total costs)/total output*

(viii) Unit margin: *(gross margin-total variable costs)/total output*

(ix) Per cent share of retail price: *(sale price/retail price)*100*

(x) Return on Investments: (*Gross margin/total cost)*

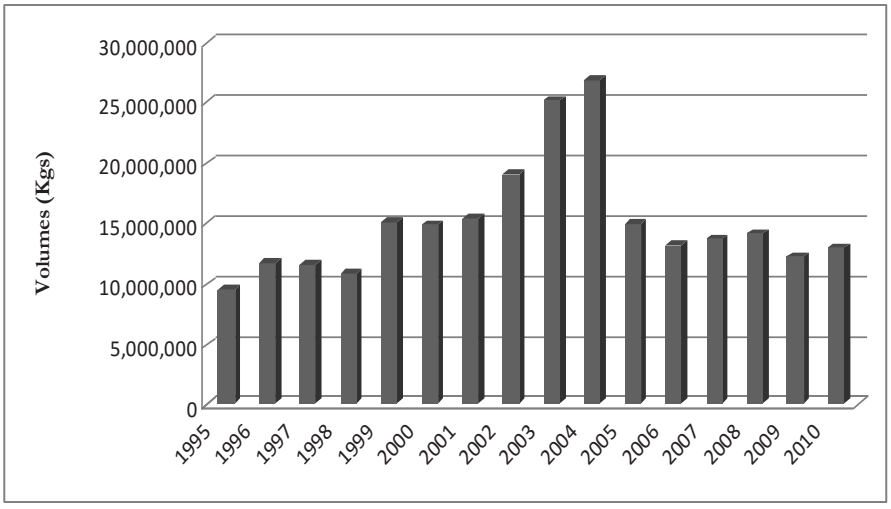
(xi) Value added*: (Net profit – investments)*

5.3 Kenya's Green Beans Sector: Standards, Governance and the Changing Market Structures

5.3.1 The Evolution of the Sector and Market Structures

Kenya's green bean industry started in the 1960s and expanded rapidly during the 1980s and 1990s (Okado 2001, McCulloh & Ota, 2002). The expansion in trade slowed down in the 1990s as the industry adjusted to the imposition of the International Food Safety Standards but has since recovered and even increased its volume of exports (Okello 2005). Figure 4.1 below gives the trends in volumes of exports, which indicate that there has been a steady increase in volumes exported up to the year 2004/5 when exports plummeted but have since remained relatively steady. The EU is the most important market for green beans accounting for about 80 per cent, 70 per cent of which goes to the United Kingdom, and the rest to Belgium, France, the Netherlands, Luxembourg, Italy and Spain. Other markets include the US and Middle East and South Africa and account for 20 per cent of the exports. Local consumption of French beans has also increased over the last few years, providing a local market for beans that are rejected by the export market.

Figure 5.1: Trends in Green Beans Exports (1995-2010)



Source: HCDA

In order to understand the governance structures in any particular value chain it is basically important to analyze the market. Markets are the simplest form of GVC governance and governance structures can be internal[23] or external[24] to the chain. In the past, agricultural commodities used to be traded on the basis of arm's length market relationships. These products were standardized and produced without reference to the needs of particular buyers and with limited information flowing along the chain. Many small producers could be involved and the output of one producer was much the same as the others (Daviron 2002: 144). In the shift towards competition over quality as opposed to price (differentiated products), the amount of information that passes between agents in GVCs increase. This invariably leads to a transition in governance structures and linkages between GVC nodes and structural changes in production. This transition creates opportunities for some producers and limitations for others (Keanne 2003) as is replicated in Kenya's green beans chain.

The Kenyan green beans sector has evolved over the years from a more traditional market based chain in the 1960's, 70's and 80's where numerous small-scale producers sold to exporters through many spot market transactions. By the early 1980s the participation of smallholders in green beans production had increased markedly to an estimated 15,000 smallholders (Jaffe, 1995). Barriers to entry for producers were low, transactions were easily codified, product specifications were simple and suppliers had the capability to supply the green beans without input from the buyers. The complexity of information exchanged was relatively low, sellers set prices and producers were price takers (Temu & Marwa, 2007). The EU supermarkets and retailers purchased green beans from the wholesale market, employing wholesale agents working on a commission basis. This placed certain constraints on the supermarkets. The mixing of produce by exporters and importers meant that they had little or no information about the product's precise origin and could not exercise any control over how products were produced. Further, the supermarkets could only purchase

[23] Refer to the overall form of inter-node linkages, which result in systematic efficiency.

[24]External governance structures include mandatory standards that producers must legally adhere to in order to access markets.

standardized products, having no control over the type or quality of product in wholesale markets. Finally, production could not be scheduled in advance. Each retailer competed for the same pool of produce as it arrived in the EU (Minot & Ngigi 2002, Okello 2005).

Recent developments in the green beans sector global value chain have seen the transformation of the chain from a market based to a quasi-hierarchical type of chain. Interviews with 2 key large-scale exporters indicated that this transformation stemmed from several factors. Firstly, UK and EU multiple stores (supermarkets and major retail chains – e.g. Tesco) greatly increased their share of total fresh fruit and vegetables sales (Nagarajan *et al.*, 1994). Secondly, the supermarkets by-passed the wholesale markets and worked directly with UK importers, delegating lower-profit functions such as quality control, monitoring, and distribution to their suppliers (Marsden and Wrigley, 1996); this meant that the large scale exporters had to integrate their chains in order to carry out monitoring and quality control functions. Thirdly, there was a marked shift away from standardized, loose product to greater product differentiation, product innovation and increased packaging and processing; the large scale producers specifically had to upgrade their integrated chains – both process and functional upgrading including the acquisition of pack houses with cold storage, slicing dicing and cutting including pre-packaging and labeling. Fourthly and most important, were consumer concerns for quality and safety, which led to the introduction of standards and regulations including traceability, which was established along the chain and monitoring and audit regimes put in place (Jaffe, 1995, Minot & Ngigi 2002, Okello 2005). In light of these market demands, costs of production rose both for large and small-scale exporters and producers in the entire chain. This invariably led to a fall in the share of smallholders participating in export markets as most of them were not able to cope with the rising standards; it is estimated that this share fell to below 40 per cent in the last decade (Okello, 2010) which reallocated market shares away toward larger holdings that were able to cope with compliance to standards (Okello 2005, Okello 2010, Minot & Ngigi 2002).

The Filiere: Key Chain Components and Actors

The commodity chain for green beans has developed to become an efficient supply chain where the produce passes through four stages, from growing in the fields to arriving on the supermarket shelves. The chain follow 3 distinct paths (figure 5.2): i.e. the produce is sourced either from smallholders or large and medium contracted farmers or even directly from exporters' farms; smallholders are also organized formally and informally into producer groups and collectively share facilities such as grading sheds when they are exporting through a common exporter. Once harvested, the processes of sorting and grading often occur in the grading sheds, which are situated either at the farm or within very close proximity to the farms; the crop is then taken by the exporter, who is responsible for transport. The product undergoes further processing, packing and labelling. Green beans marketed through this chain must be certified (by an accredited third party) as meeting GLOBALGAP, BRC, MRLs and, in most cases, retailers' private food safety protocols. A phyto-sanitary certificate issued by a competent authority guaranteeing absence of prohibited pests must accompany the beans. In addition, the beans must be traceable from the retailer‘s shelf back to the grower‘s plot.

Standards requirements and specifications for export are given by EU supermarkets; the responsibility of ensuring quality lies on the exporters, exporters subsequently ensure that participants at the production end of the chain are adhering to set standards through various monitoring and enforcement mechanisms to be discussed in the next section. From the fore-going, three major functions within the sub-sector can be distinguished as: *production (or growing); collection, processing and packaging of the product; and export of the product to the consumer markets*. The ranges of participants who fulfil these functions are the value chains actors (Summary Figure 5.2).

Production

From the fieldwork carried out in 2009, there emerged four differentiated kinds of producers. At one extreme are the large farmers at the other are the very small-scale growers. In the middle are small to medium farmers who grow beans primarily on contract.

Large Farmer

The large farmers have farms of more than 50 acres, and produce green beans, other vegetables and often fruit. The large farmers use the latest in technologies, hire all of their labour and deliver specified quantities for export at specified times. The large farms are either owned by the medium to large exporters (vertically integrated) or by individuals who are on contract to large exporters. Their costs of production are fairly consistent and growing green beans is carried out as a business with tight cost controls and scientific planning. The large farmers procure all of their own inputs, seed, chemicals, and fertilizers. Along with the inputs, he must also provide his irrigation system and cover the cost of pumping the water in case of irrigation. The large farmer keeps very accurate records of all elements associated with the production of the beans in a given field on his farm so that he can provide accurate information on use of chemicals on the plants for Minimum Residue Limit (MRL) control. Large-scale producers are about 10 in number and employ considerably more than thousand workers and rely heavily on casual labour during glut periods.

Small to Medium Contract Farmer

These farmers work directly with an exporter either on contract basis or as out-growers. Under contract arrangements, the exporter provides the seed and sometimes even the fertilizers and pesticides to the contract farmer. Small contract farms need to plant at least one acre in size to have a sufficient yield to be able to make it worthwhile for the exporter to work with them. Even then, there needs to be a reasonable number of them in the same area to make it worthwhile for the exporter to develop long-term relations with them and therefore they are mostly organized in informal groups.

The small to medium contract farmer employs quite a few labourers and relies heavily on family labour. The exporter visits the small contract farmer to pick up the product based on his own export schedule. This is usually three times a week during the low season and up to five times per week during the high season. After picking up the product at the farm, it is transported to the exporter's pack house for re-grading and final packaging.

Care must be taken to record the use of all inputs into the production of the crop. This presents more of a problem for the smaller

farmer, so the exporter usually develops the spraying schedule for each contract farmer and assigns an agronomist/field extension worker to work with the contract growers. The field extension workers ensure that all the aspects of production are done according the guidelines set out by the EU. Recent estimates of the number of specific out-growers working with exporters (being supplied) are about 4,000 small farms (USAID). Each of these farms employs on average of five and ten workers, working between three and five days a week depending on the season.

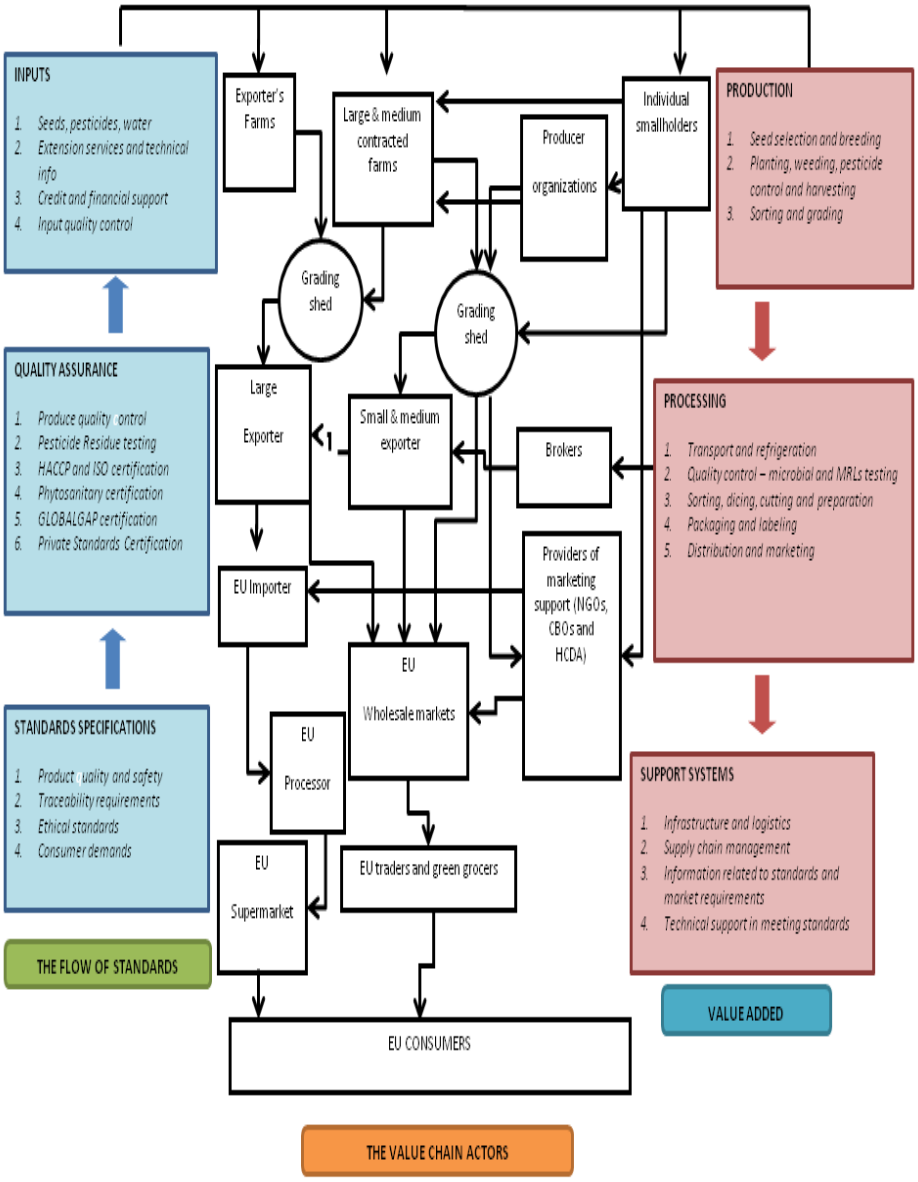
Individual Small Holder Farmer

The small farmer often plants an area of one tenth and up to 2 acres. Farmers with less than an acre are considered to be too small by the contract exporters. They produce what they can and then sell most often to a broker or to a small exporter also known as a briefcase exporter[25]. The small farmer's biggest disadvantage is he/she must procure seed and chemicals and does not get advice on the proper growing techniques. In many cases the farmer relies on the public sector extension staff [26]or asks his neighbour what products to apply (learning by doing). Also, because he cannot afford top quality seed, he tends to grow less expensive varieties that are not preferred by the client and hence gets a lower price at the farm gate. Many of the small farmers have been or are members of groups that have had "contract" relations with exporters. However, many of them have cheated on those contract terms and subsequently been excluded by the exporters. Some have also been excluded by the exporter for not adhering to guidelines of production or not meeting the bare minimum standards of GlobalGAPs.

[25] Briefcase exporters are those exporters who do not own farms but they own or lease pack houses during harvest season which they use to sort, pack and grade produce, often from individual farmers who do not have contracts with exporters.

[26] In this case, these are HCDA officials or Ministry of Agriculture extension workers.

Figure 5.2: Kenyan Green Beans Value Chain



Producer Groups

These are a concentration of farmers within a specific geographic area with the same agronomic and post-harvest practices. An important effort over the past decade has been to regroup small farmers into economically viable units that can produce quality product while monitoring their production. The HCDA, FPEAK and some NGOs and CBOs, have led these efforts, through funding from development aid organizations such as USAID, JICA COLECEAP amongst others. Many of the groups of small farmers are organized by and work closely with the exporter. The exporter still provides the inputs, as well as technical assistance through an agronomist or a field extension worker to the group of 30 or so farmers. This field extension worker supervises the production and manages the spraying schedules and ensures proper record keeping for all members of the group. He/she also keeps an eye on the leakage of the product to other buyers (brokers or other exporters).

To make this economical, the growers must be concentrated within a reasonable area - about a 10 km radius - but do not necessarily need to be adjacent. For these groups, the exporter still prefers to have individual farmers with farms of at least one half acre under production, using at least 5 kg of seed per planting with a harvest totalling about one ton. The whole group should be able to provide at least 1-2 tons per collection, which seems to be an economic breakeven point.

Collection and Brokering

Over twenty years ago, beans were collected, packed and exported by brokers who served the role of doing much of the collection from the very small farmers, buying from them at cheaper prices and reselling to the exporters. Today, there is much less collection by brokers, but they are still active. With the increasing requirements for traceability of the product, exporters must contract directly with the growers.

However, the small, medium and even large exporters frequently use brokers to help them acquire additional products, often using them as agents. While serving an important economic role in the sector, brokers and briefcase exporters do cause quite a bit of havoc in its orderly functioning. As they have no up-front costs to the growers (they do not provide seeds, etc.) they can pay a higher price than the exporter, and they can pay in cash. This is an extremely attractive element for a small

farmer, who knows that part of his sale to the exporter will be used to cover the advances on seeds and pesticides. In areas where there are no exporters, the brokers are the main outlet for the farmers, but pay relatively low prices, equivalent to half those in areas with more competition. In areas where the exporters need to get additional products, beyond that from their contracted farmers, they will use brokers on a regular basis to buy product from farmers in the region to round out their loads. The number of brokers is not known, but brokering activity increases during the high season, when prices are better and there is greater demand for product.

Processing, Packaging and Exporting

This is the key function in the entire industry that makes it work. This involves the purchase of the beans from the grower, final grading into the appropriate categories, packing, and shipping to a buyer in Europe. Most of the exporters working with contract growers have trained them on grading and packing in crates. The produce is then re-packaged by exporters according to supermarket guidelines and requirements in small quantities and labelled ready to go directly to the supermarket shelves.

There are three major groups of exporters: the large vertically integrated the small to medium, and the briefcase exporters.

Briefcase Exporters

They function only during the high season when prices are good and produce is in plenty. As they are not consistently in the market, they procure their product from brokers, rent space in packinghouses around the airport, loose pack the product, and ship to buyers in Europe. They do not own any farms, however they have links with European importers and have exporting licenses and in some cases are even certified by accredited standards bodies. They do not have any regular growers although some have recently begun having informal arrangements with producer organizations.

Small to Medium Exporters

These exporters are in the market all year long, but do not have the resources or ability to reach the scale of the very large. They are often constrained by cash flow in their attempts to grow. There are approximately 15 – 20 exporters in this category doing between 400 and

1500 tons per annum of all products, but mostly green beans. In most cases these exporters have their own packing houses at or near the airport, though some will rent space for the final pack, some of them also rent space in the HCDA pack-houses during the high season. These small to medium exporters are almost all integrated backwards into the production, for at least some of their green bean needs. Their farms are generally smaller, between 5 –20 acres, though some have much larger farms. They get the bulk of their product for export from growers whom they contract to grow for them. But they are also facing increasing cost and quality constraints that make it uneconomical for them to deal with individual small growers, so they must either work with larger groups of out-growers/producer groups (as described above) or with larger individual farmers.

Large Integrated Exporters

These exporters have increasingly integrated their operations both forwards into the markets and backwards into the production. Their total tonnage of exports ranges from between 2,500 tons per annum to 15,000 tons, all products included. There are only about eight to ten firms that fall into this category (including KHE, Everest, Sun Ripe, Homegrown, East African Growers, Vegpro, Indu Farms, and Sulmac), with varying degrees of integration. The extreme cases may be firms like Vegpro and Everest, which receive 95 per cent of their product from their own farms and from large contracted growers. These large exporters have very strong market links and generally provide a fairly consistent amount and quality of product over the course of the year. Some of them, like Homegrown and Everest, are integrated into the markets, with shareholding in the distributors in Europe.

Shipping/Transport

The shipping and transport function is from the exporter's warehouse to the importer's warehouse in Europe. This function is usually paid for by the exporter, but is contracted out to various service providers. Airfreight is the most important and most expensive component of this function, with charges averaging about $1.2 per kg shipped. In addition there are taxes of costs (6 cents/kg), costs of loading the product onto the plane, etc. The exporter usually sells his products Cost Insurance and

Freight (CIF), so he pays all of the costs associated with getting it on the plane.

5.3.2 Standards and Emerging Governance Structures in the Green Beans Sector in Kenya

As was discussed in previous sections, what were previously private and voluntary standards over time became mandatory or at least, defacto mandatory (necessary in order to access markets). Consequently, the critical success factor for this chain is centred on standards and quality requirements and so are the governance structures.

Results from the survey indicate that the standards required in the green beans sector are split in 2 broad clusters namely, product certification and quality management systems (chapter 2) and broadly other quality management systems such as HACCP, GLOBALGAP, MRLs, product conformity, packaging specificity and traceability requirements. In addition, handling and hygiene practices during harvesting, grading, and packing of green beans are all closely monitored by field extension workers who also carry out internal audits for the farms. Growers are required to have a toilet, pesticide storage unit, and a facility for hand washing at the farm or the grading shed. Exporters to the EU supermarkets test the water and soil twice a year for pathogens. The exporters also require farmers to keep records of the type and quality of inputs (pesticide, water, or soil) used. In order to enforce compliance with these practices, EU importers have increased their monitoring and coordination of input use. They generally monitor the exporters expecting them to monitor growers in turn. Increasingly, some EU importers and large-scale integrated exporters have extended their monitoring to farm level through regular visits.

Various forms of enforcement regimes were observed in the green beans value chain. Surveillance of individual farmers and producer groups by exporters' field extension workers is the method mostly employed to ensure compliance at the lower ends of the chain whereas at the exporter level, private inspection, third party certification and regulatory actions are used by consuming countries and third party organizations to ensure/ascertain compliance (Figure 5.3). The exporters are then accredited by third party certification bodies.

At the lower end of the chain farmers are organized into producer organizations either formally or informally and receive support from exporters in form of inputs such as seeds, fertilizer and pesticides as well as costs related to meeting standards which are given on credit to individual farmers and deducted from their earnings by the exporters. In addition, some farmers also have contracts with producers and these contracts basically specify the quality and price requirements for production, field extension officers are charged with responsibility of ensuring that farmers adhere to contracts. Those that do not have written contracts have informal word of mouth agreements with specific exporters. There are also a number of producer organizations that have benefited from various support services sponsored by NGOs and other development partners such as PIP/COELACP, JICA, GTZ and USAID. Table 5.3 below gives a summary of green beans farmers receiving support from exporters and/or other institutions.

Table 5.3: Support Services Received by Green Beans Farmers

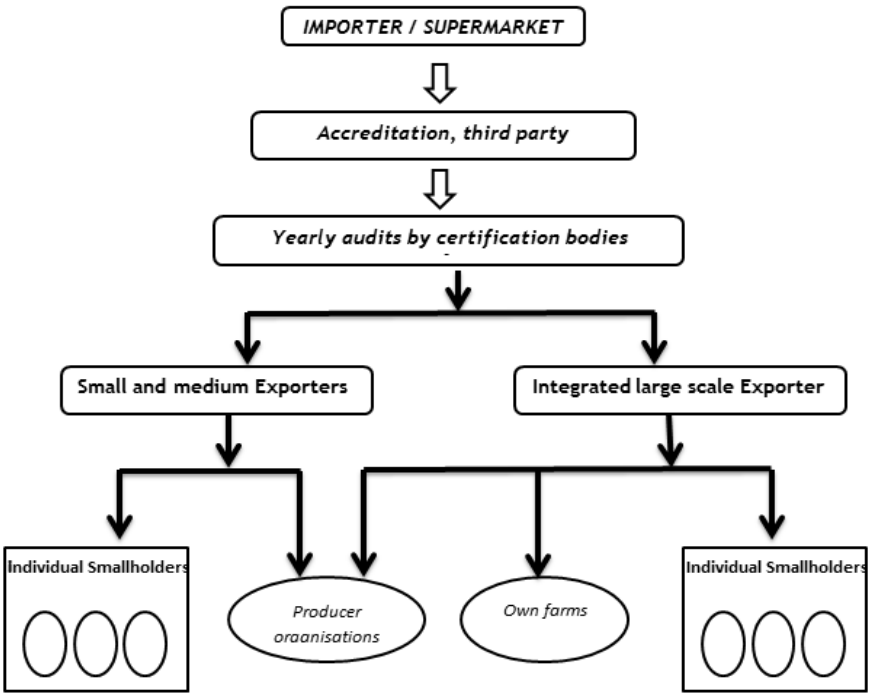
Support Service	*Number of Farmers (N=72); No. belonging to a Producer Organization =67*
Inputs – Seeds	64
- Fertilizer	12
- Pesticides	63
Training on GAPs and Standards	ALL
Upgrading –building of structures/requirements for standards	38
Compliance to standards including auditing	67
Information	62
Transport	72

Source: Survey, 2009

Figure 5.3 below is an illustration of how standards in this case have acted as an impetus for better organization and chain management and more sophisticated farming practices – while at the same time reducing transaction costs, achieving economies of scale and minimizing the risks of exclusion from the value chain especially by smallholders. At the

lower levels – because of low capabilities and competencies to meet required specifications, intense monitoring of smallholders and integrating them into the exporters' production functions is necessary to ensure compliance – which demonstrates a more hierarchical type of governance, whereas at the higher levels of the chain – the capability and competency of suppliers to meet required standards is high, third party certification and accreditation are used for enforcement which demonstrates a more market oriented type of governance, this type of arrangement can attest to the existence of a hybrid chain which is quasi-hierarchical.

Figure 5.3: Monitoring and Enforcement Regimes in the Green Beans Value



Standards chain

It emerges from the chain that importers through standards hold the power to specify what is to be produced and how it is produced which they specify to exporters though codes of practice and contracts. It is the responsibility of the supplier (in this case exporters) to pay for and provide proof of evidence of certification, failure to which they risk losing market access and may face fines when they don't meet contract specifications. This proof is obtained by third party certification process through auditing which is done annually at the cost of the exporter. In the relationship between exporters and farmers, we observe that where various support services are provided by exporters, by virtue of having 'invested' in them, intense monitoring takes place and the exporter determines the specifications of how, what, where and when the product is produced. There also exist various social auditing processes among groups of farmers. The consequence of such power relationships is that as more functions are pushed down the chain, so are more costs and more barriers resulting in the opportunity for some to obtain temporary rents. As part of this development, learning rents become necessary to support the upgrading process within the value chain especially for lower end participants such as smallholders. Some of these rents are created and earned by innovators as in product innovation driving growth models - while others are created institutionally to support 'learning by doing' as in how producer groups organize to 'learn' about the standards. The power relationships in this specific chain therefore influence not only the cost structure of the chain but also the prices and margins for different actors as will be discussed in the next section.

5.4 Costs, Margins and Rent Distribution in Kenya's Green Beans Value Chain

Different chain participants have different cost structures due to factors related to economies of scale, information or position in the chain. The analysis of costs and margins is calculated for various players as already discussed in the previous sections: An individual farmer under option 1 certification; a smallholder belonging to a producer organization (under group certification); a large scale producer/exporter and a medium scale exporter have different costs and margins resulting from differing economies of scale amongst other factors. The costs and margins are calculated based on the following categories (Table 5.4):

5.4.1 Costs and Margins for Various Segments of the Value Chain

An Individual Farmer under Option 1 Certification

The production of green beans for export is both labour and capital intensive. According to the survey carried out in 2009, only 3 per cent of smallholders interviewed were certified as individual farmers –under option 1 certification. Being under option 1- certification entails the farmer paying for and getting their own certification after fulfilling GLOBALGAP and other requirements through various forms of up-grading on their farms.

An individual smallholder participating in the export of green beans has to have a minimum area of one acre under green beans in order to secure a contract with an exporter. The farmer also has to make several investments in order to meet the requirements for export. For instance, a farmer needs to change a number of production practices and make significant investments including the following: i) purchase protective gear, including long-sleeved overalls, gumboots, rubber gloves, nose mask, goggles, and hat; ii) construct a shower room for use by the spray operators, a well-ventilated and secured pesticides store, a pesticide disposal pit and an incinerator; iii) apply only approved pesticides that are typically more costly but safer than those they replace; iv) implement an integrated approach to managing pest and disease problems, and only use pesticides when absolutely necessary (i.e., upon approval by the exporter's agronomist or field extension worker); v) construct a grading shed (with cement floor, washable tables, and facility for washing hands) and a pit latrine adjacent to the shed; vi) build a charcoal cooler for holding graded beans prior to pick up by exporter; vii) observe personal hygiene at all times during grading of green beans. The hygiene measures taken include the use of headscarves by women and hats by men, barring children from the grading area, and have a designated place eating or smoking.

Table 5.4: Summary Categories of Variable Costs by Value Chain Stage

Farm Production	Transport, Processing and Packaging	Export - International Logistics
Land preparation Machinery (hired or own use) Seeds Fertilizer Pesticides Labour (planting, weeding, spraying harvesting) Transport to grading shed Standards related inputs Certification costs, auditing etc	Transport costs form shed to pack houses Pack house costs of rent Electricity Telephone internet water Labour Storage costs standards and hygiene requirements Packaging and labelling Licensing	Storage costs Loading costs Airfreight costs Duties and taxes Clearing fees Licences and permits

Source: Author

Below are the cost components calculated as a per cent of the total cost. The computations are done per acre and based on an individual farmer under option 1 certification and a farmer under group certification, a briefcase exporter and a large scale integrated exporter. The costing of the inputs such as fertilizers, seed, labour for land preparation and harvesting are estimated in comparison with the costs related to meeting standards. The margins are also calculated and later compared with other producers and chain participants. (Appendix 5.1, 5.2 and 5.3).

Table 5.5: Composition of Costs for Individual Smallholder vs. Smallholder Under Group Certification

Cost Component	*Individual smallholder under option 1 certification*	*Individual smallholder under group certification*
Harvesting, sorting & grading	12	32.9
Fertilizer	7	18.2
Ploughing and harrowing	11.8	12.5
Equipment for standardization	32	10.1
Testing and accreditation	28	6.7
Seed	2.5	6.6
Spraying	1	5
Weeding	3	8.1

Source: Survey results 2009

From the table we see that the costs of standardization represents 60 per cent i.e. 28 per cent of the variable costs for yearly testing, auditing and certification and 32 per cent of the initial costs for investment which also include the costs for infrastructure related to meeting standards. A smallholder farmer therefore has to have a large capital base in order to invest in the basic infrastructure required to participate in the export chains. Notably, as the acreage increases, so does the economies of scale, mainly because the costs related to standards do not change hence it is easier for larger farmers with more acreage to participate in the export chains. The gross margin for a small farmer given as (revenue - total variable costs) is obtained and is about 6386.28 per acre. The return on Investment (ROI) given as the (income-total cost)/total cost is 32 per cent is an indication of how attractive it is for farmers to participate in the export market instead of other ventures.

An Individual Farmer Under Option 2 (group certification)

An individual farmer under option 2 certification benefits from economies of scale arising from belonging to a producer group. The groups assume logistical and organizational costs and receive a cooperative-gate price (producer groups do not realize profits). The average group size was 28 people and the groups are also used for

training; information sharing and obtaining credit from micro-finance institutions. Findings from the survey indicate that 31 per cent of green beans farmers interviewed have contracts with exporters while the rest of them market their produce through their respective producer groups to briefcase exporters (brokers). Appendix table 5.2 gives an outline of the cost structure and margins for a farmer producing beans on a one acre piece of land for a year.

From table 5.5 above we can deduce that, the costs for meeting standards and therefore qualifying to participate in the export sector are 17 per cent i.e. the initial investment costs for a farmer exporting through a producer group is much less and forms only 10.1 per cent of the total costs as group members contribute collectively to build grading sheds, and other infrastructure required for exporting. Furthermore, due to group certification the costs related to meeting standards are relatively lower and comprise only 6.7 per cent of the variable costs in a year. Other costs such as equipment and spraying are also much lower because the exporter charges a co-operative price and the spraying is done under the supervision of their field extension workers. The bulk of the costs therefore are incurred during harvesting, sorting and grading which are integral parts of the value adding activities of the lower end of the chain. Moreover, the farm gate price is relatively lower because the producer groups do not bargain over the prices as they are determined by the exporters and specified in the group contracts at the beginning of each production year. The gross margin relatively higher at 990.19 euros per year more than doubles the gross margin of an individual small-scale farmer with an acre under option 1 of certification. The ROI is also much higher at 45 per cent making it much more attractive to participate in exporting under group certification. It is therefore evident that the economies of scale achieved by belonging to a group are more advantageous.

A Broker/Briefcase Exporter

A broker/brief case exporter often does not have a farm but may have links with some importing companies in the countries of destination and may sometimes operate seasonally. However the HCDA requires them to have the following in order to obtain an export license: a certificate of Business Registration from the Registrar of Companies; written contracts with farmers for supply of produce of a certain quality and standard,

confirmation from HCDA officials that the firm really exists packing facilities (own or rented pack-house); an adequate knowledge of quality standards for horticultural produce on the market; documentary evidence from their overseas client (e.g. a letter, fax or e-mail) that the overseas client have an agreement to export with the exporter; an export license from HCDA (Export License fee Kshs.5,000/- for 3 years). In addition, certification and accreditation is required mainly from the overseas clients and often a phyto-sanitary certificate from Kenya Plant health Inspectorate services (KEPHIS) is also mandatory including HACCP and ISO certification and any other industry standards such as BRC.

These exporters therefore employ labourers on a temporary basis during the 'high season' with only the management being permanent staff. They usually have contracts with importers in the countries of destination to supply produce at set quantities and qualities and therefore they have to meet the contract terms and specifications by all means. This then requires them to obtain produce from their contracted farmers as well as other farmers. They transport the produce from the firms, grade and sort and package (including labelling) and the rejected produce are then diverted to the local markets. There are about 12 such exporters in the horticulture sector and they not only export beans but other produce[27] as well.

For this particular exporter, the exports are 2 main products- green beans and snap peas and the costs of production are therefore not limited to the export of beans only and in order to obtain the costs and margins of green beans the calculations include and involve scenarios of other products as well and calculating in addition, the contribution margins for each (Appendix 5.3). However, since there are multi-products involved, we weighed each of the two major products and de-composed the values related to green beans summarized in table 5.6 below.

The initial investment for a briefcase exporter participating in green beans exports is only 6 per cent of the total costs; this is an advantage because their initial investments are much lower relative to the total costs. Moreover the costs for meeting standards are just 1.05 per cent of

[27] Snap beans, Asian vegetables and other exportable vegetables destined to Europe provided they are on season.

the total variable costs, which makes it much easier for them to meet the required standards. The costs of entry into the export chain are 8.05 per cent of the total costs. The bulk of their costs are in airfreight, which is 53 per cent of the total variable costs. The gross margin is also relatively higher at 694726.41 euros per year for green beans. This makes the ROI for the beans chain much higher at 41.1 per cent, an indication that briefcase exporters are indeed benefiting tremendously from participating in the chain. The cost of meeting standards as a per cent of total costs is 16 per cent.

Table 5.6: Composition of Costs for a Briefcase Exporter

Cost Component	*Per cent (%)*
Airfreight	**53**
Purchasing produce from farmers	30
Initial investments	6
Testing, auditing and certification	1.05
Labour	5
Monitoring farmers to ensure compliance	2
Others (water, electricity, packaging and labelling, storage and renting a pack house)	3

Source: Survey results 2009

Large Scale Exporter

A large-scale exporter with integrated chain participates in the production, packaging and exporting and usually owns their farms as well as pack-houses. They may also procure some of their produce for export from outgrower farmers with whom they have contracts and whom they support by providing inputs – seeds, fertilizer, and pesticides on credit as well as technical advice and training on standards. Out of the 10 major large-scale vegetable producers/exporters in Kenya, multi-national companies comprising mainly of Dutch and British entrepreneurs own 7 of them. These exporters employ a large number of workers (in thousands) in their farms as well as in their packhouses and export an array of products including cut flowers. They are located in

geographical clusters that benefit from proximity to water and irrigation, and abundance of cheap labour for their farms including infrastructure. Most have their pack houses in the Export Processing Zones (EPZs). They have direct links with supermarkets in the EU and have contracts to export specific quantities of goods of specified quality. They therefore adhere not only to universal GlobalGAP and HACCP/ISO standards but also to retailer standards such as BRC, Tesco natures choice etc.

Appendix 5.6 summarizes the costs and margins for a large-scale exporter with an integrated value chain supplying many different products and having supplies from their farms and from farmers with whom they have contracts. All aspects of production are done 'in-house'. Table 5.8 gives a weighted summary of the cost components for the green beans production chain. The initial investments for entry into the chain are 12 per cent of the total costs- ie 5 per cent for initial investments and less than 1 per cent for standardization. Airfreight forms the bulk of the costs at 60 per cent while the costs for standardization are less than 1 per cent of the total variable costs. The costs from own production are much lower because the main product is flowers which is managed under a different integrated chain; the bulk of vegetables for export are purchased from farmers with whom they have contracts. It can be deduced that this particular producers tend to gain a lot from economies of scale as a result of having an integrated chain. Moreover the returns are huge wit the margins being about 36016176.47 euros per annum. The return on investment is 63 per cent, which is very high as compared to other participants of the value chain.

Table 5.7: Composition of Costs for a Large-scale Producer with an Integrated Value Chain

Cost Component	*Per cent (%)*
Airfreight	**60**
Purchasing produce from farmers	8
Initial investments and infrastructure for standardization	14
Auditing, testing and certification	<1
Labour	6.9
Purchase of produce from farmers	2
Transport to pack house	1
Others (water, electricity, packaging and labelling, storage and renting a pack house)	6

Source: Survey data

Summary Comparison of Costs, Margins and Profit among the Chain Actors

From the above analysis the cost structure for each of the chain actors is summarized in table 5.8 below. The unit costs for an individual farmer are the highest even though the unit profits and the unit margins are slightly higher than with a farmer under group certification, this is because the groups often negotiate lower prices with exporters to 'cover up' for any losses due to rejection. It is also apparent that the costs of meeting standards are much higher for the smaller producers i.e. 28 per cent for an individual farmer, this coupled with high initial investment costs create barriers to entry for new farmers. Certification under groups, however, substantially reduces these costs thereby improving the margins albeit slightly. Comparing the ROI values indicate that exporters particularly have higher ROI values than farmers as they benefit from economies of scale gained through exporting their produce in bulk. For the exporters however, the bulk of their costs (more than 50 per cent in both instances) air freight; this is high considering that it is the exporters that pay for transport.

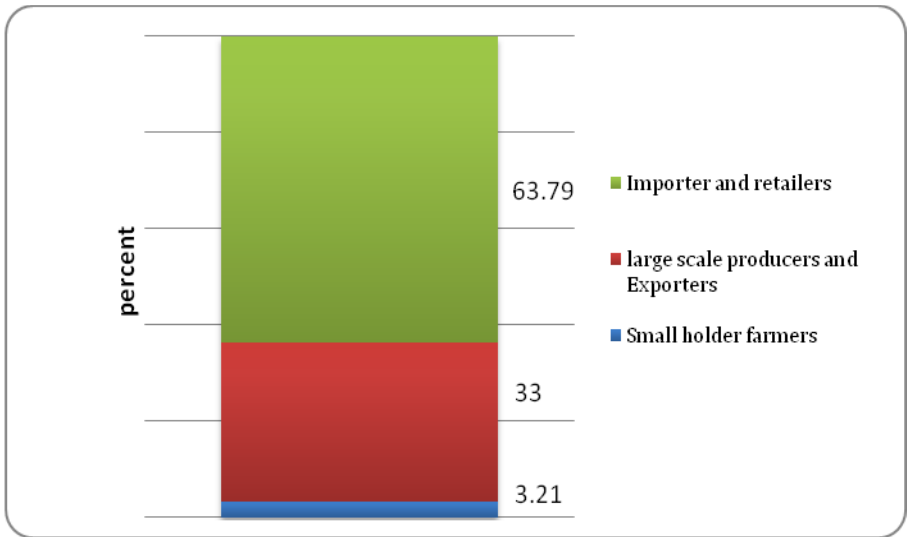
Table 5.8: Summary Costs, Margins and Profits for Various Chain Actors

	Individual farmer	*Farmer under group certification*	*Briefcase exporter*	*Large scale exporter*
Unit total cost	0.38	0.14	2.1	1.45
Unit variable cost	0.26	0.13	15.11	1.23
% Investment costs	32.40	10.34	6	5
% Variable costs	67.60	89.66	93	86.7
% Cost of standards	28.00	6.89	1.7	0.79
Unit price	0.29	0.25	2.92	3.12
Unit profit	0.80	0.88	0.97	1.02
Unit margin	0.54	0.89	0.88	0.98
% Share of retail price	3.3	2.78	31.90	33
Return on investments (%)	32	36	41.1	63

Source: Survey data

The share of retail prices is summarized below shows that farmers smallholder farmers who form the majority of producers in the sector (estimated at 40000 by Okello (2005) and currently estimated at over 70,000 by HCDA have the least share of the retail price at 3.3 per cent, whereas exporters and large scale producers have a modest 31 an 33 per cent respectively, the bulk of the share of retail price (63 per cent) goes to developed country importers and retailers (figure 5.4 below).

Figure 5.4: Share of Retail Price for Various Actors in the Green Beans Value Chain



5.4. Distribution of Rent for the Green Beans Value Chain

Figure 5.5 below gives a summary of the main components of the value chain; the value adding activities carried out by various segments; the distribution of retail price; the numbers of various actors, the value added and value capture. Value adding activities in their particular chain are mostly related to meeting the required standards such as GAPs, HACCP, sorting and grading and packaging and labelling to ensure traceability. This was only possible for those actors in the export chain within the country and was not possible for foreign importers and supermarket chains (table 5.9).

Table 5.9: Summary Components for Value in the Green Beans Chain and Rent Distribution

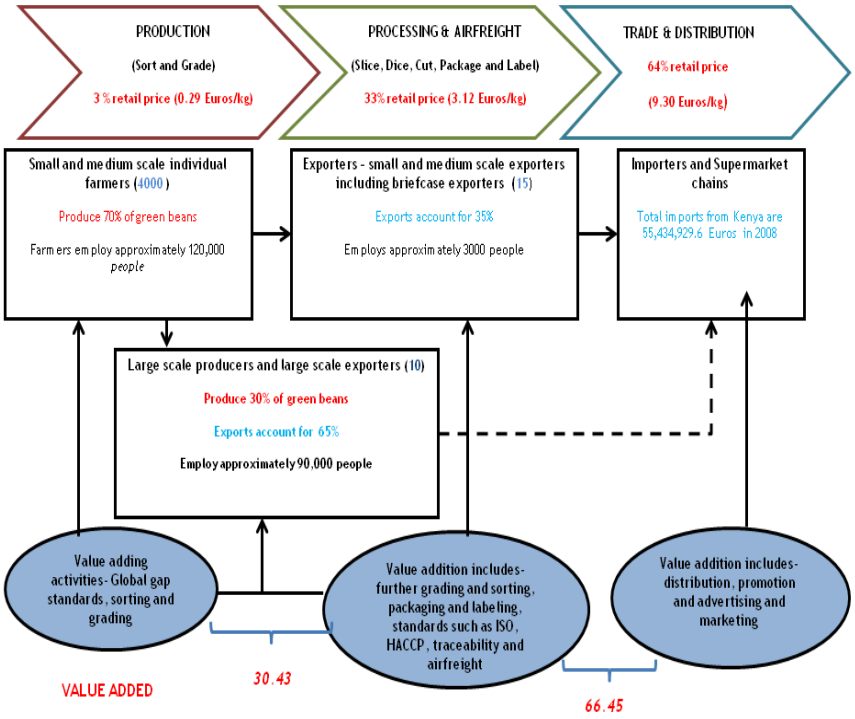
Component	Actors	Value adding activities	Price (euros)	Per cent share of retail price
Production	Small holders, large scale integrated exporters	Production, sorting, grading, meeting standards and related requirements (GlobalGAP)	Farm gate price is 0.29 Euros /kg	3.21
Processing and Air freight	Exporters, large scale integrated exporter, briefcase exporter	Sorting, grading, packaging, labelling, traceability (bar coding), meeting required standards, HACCP, ISO,	2.11	33
Retail and distribution	Retailers	Distribution to outlets, advertising etc	9.3 euros/kg	63.79

Source: Survey results 2009

From the figure below, the value added at each stage of the value chain was found to be 30.45 per cent between the farmers and processor and 66.45 per cent between the processors and exporters. Much of the value adding takes place at the processing stage mainly done by exporters through sorting, grading packaging and labelling. There is also an additional premium received as a result of meeting certain standards. However the incomes are very low at the lower ends of the value chain with farmers receiving a paltry 3.21 per cent of the retail price. Exporters

earn 33 per cent of the retail price and the lion's share goes to developed country importers and retailers.

Figure 5.5: Value Addition vs. Incomes for Various Actors



5.5 Conclusion

The chapter contributes to the growing literature on globalization and trade, specifically with respect to how standards determine the governance of value chains and subsequently the income disparities observed in these value chains. From the study there are four main conclusions that can be drawn. First, that standards can reshape the governance structures prevailing within a chain which is corroborated by empirical results showing that before the introduction of standards in the early 1990's the green beans chain was based on numerous spot markets and quality was determined by colour and size, prices received depended

on quality of produce and prevailing demand and supply market forces. However after the advent of standards in the 1990's there was a shift towards more coordination of activities. It is evident that standards have hence played a major role in determining not only the structure of the chain but the power relationships that prevail in this chain. Standards are developed and specified by developed country retail chains and passed on to developing country producers and exporters who have to adhere to them in order to access the export market therefore making it an important requirement for entry into the export chain. Due to lower capabilities to comply at the lower ends of the chain, farmers often receive support from exporters and other institutions and in turn intense surveillance of individual farmers and producer groups by exporters' field extension workers was one way of ensuring compliance making it more hierarchical - at the lower ends of the chain. However at the exporters' level enforcement by various third party certification bodies was observed through various audits making it more market based – the chain is therefore a hybrid quasi-hierarchical type.

Secondly, the influence of standards on transaction costs is two-fold owing to the governance structure that prevails. Standards are codified and carry information and therefore reduce costs of information search as well as monitoring and enforcement costs. As suppliers/exporters are audited, certified and accredited for multiple sector standards, the transaction costs which would otherwise be involved in monitoring and enforcement is greatly reduced for developed country participants in the chain. However due to a considerable amount of upgrading resulting from standards, more costs of compliance are invariably pushed downstream thereby raising the barriers to entry especially for small holders.

Thirdly, on a theoretical basis, comparing the costs of transactions among various segments of actors in the value chain it is apparent that there is disparity in the way costs are spread over various cost components. Smallholders have a comparative disadvantage in complying with quality standards. For instance, the cost of standardization as a per cent of total costs is highest for individual smallholders than any other actors in the value chain and stands at 14.63 per cent. In order to mitigate the effects of rising transaction costs, smallholders have formed producer organizations within which they collectively pay for costs related to meeting standards and achieve group

certification thereby benefiting from economies of scale. Joining a producer organization reduces this cost to 7 per cent. As we move further along the value chain, the cost of standardization for exporters at this level is very low at 1 per cent or below- which is a clear indication that meeting required standards is relatively easier for exporters as they also benefit from economies of scale.

The profit margins are highest for retailers, followed by exporters and lower for smallholders. Likewise, the profit margin and the ROI is also much lower for smallholders and much higher for large scale exporters, this is partly due to the fact that these exporters benefit from economies of scale and are able to minimize costs and remain competitive. However when we analyse the share of retail prices, we see that this is where there is the worst form of inequity; whereas farmers add around 30 per cent value to the produce, they only receive 3.21 per cent of the share of the retail price; most of the value addition occurs at exporter level where 60 per cent or more of the value is added, yet exporters receive a paltry 33 per cent of the retail price. This means that the largest share of the retail price goes to developed country importers and retail chains that get high premiums from the specialty beans or the high quality produce that they are selling. Dominant buyers such as European supermarkets are major drivers of the value chains in which they participate – in effect, they set the standards; transfer the costs of meeting standards to developing country producers and exporters; get additional innovative rents as a result of setting these standards and consequently the most benefits.

In a world where developing countries are struggling to have appreciable impacts on rural poverty, export value chains for 'high value' agro-food products are seen as presenting positive 'models' that might be emulated elsewhere and across a broader spectrum of commodities. At the same time, standards are increasingly shaping the ways in which such value chains are governed, and have raised the spectre of smallholder exclusion. While the evidence on this is far from conclusive, this chapter points out the inequities that exist along such value chains and the impact thereof that it would have on a myriad of participants especially smallholders at the lower ends of the value chains – mainly smallholders and employees who stand to benefit from higher incomes and this would presumably contribute towards poverty reduction and subsequently, development.

6 Smallholder Participation in High Value Chains: The Case of Kenya's Horticulture Sector

6.1 Introduction

In the past two decades, the demand for high value agricultural products has increased exponentially in developed countries mainly due to rising incomes and a demand for differentiated products. These developments have led to new market opportunities for developing country producers to move away from low-income traditional exports to high value products often produced predominantly by smallholders. Consequently, efforts to encourage the production of high value food products in sub-Saharan Africa, is often a strategic move to alleviating poverty in the region. The importance of market participation is based on the premise that incomes and, hence, the livelihoods of smallholder farmers, are likely to improve if they gain greater access to markets for the commodities they produce. Markets and improved market access for smallholders are a prerequisite for enhancing agriculture-based economic growth and increasing rural incomes. According to WDR (2008) & IFAD (2011), smallholder participation in global chains must be built upon the establishment of efficient and well-functioning markets and trade systems that keep transaction costs low minimize risk and extend information to all actors.

Due to changing context of trade and globalization, commodity chains in developing countries have undergone several transformations requiring higher levels of coordination of value chains partly due to the proliferation of standards (Reardon & Barrett 2000, Swinnen 2007, Narrod *et al* 2009). The need to control for quality and safety in high value chains involves specialised production – lumpy investments in equipment and processes, which require large capital investments, which smallholders cannot easily afford. However, it is often only the well-endowed larger and skilled farmers that have the ability to be part of

these coordinated marketing chains and alliances. Only a small number of farmers in developing countries have the ability to be part of these lucrative foreign markets and even if they do participate in these markets, smallholders individually enjoy only a limited bargaining power (Kaplinsky & Morris 2001, Kirsten & Sartorious 2002). In the face of imperfect markets and high transaction costs, these smallholders are rarely able to exploit all the potential gains from commercialization or participation in global value chains (de Janvry *et al.* (1991), Key *et al.* (2000). In the absence of mechanisms to cope with these constraints, smallholders are less likely to participate in markets, or when they do, they are also lees likely to realize the full benefits of participation.

From the perspective of the producer, the motivation to participate in high value chains, is influenced by prevailing production and market structures – which determine transaction costs and, or prices. It may emanate as a response to missing markets in an environment of pervasive risks, incomplete information and/or information asymmetry, the need to access credit to overcome input supply problems, potential enhancements in access to extension advice, and increased market integration (De Janvry *et al.* 1991, Govereh & Jayne 2003, Key & Runsten 1999, Key *et al.* 2000). Much of the literature takes it as given that producers predominantly participate in these chains in order to earn additional income (Little & Watts, 1994), although a subset of studies do acknowledge, or at least imply, that individual farmers may contract or participate in these value chains for differing reasons (Delgado, 1999). A unifying theme across the literature, however, is that informal and formal institutional development remains important in creating efficient market systems for the development of small-scale agriculture (Key & Runsten 1999, Narrod et al. 2009).

In addition, the changing context of trade liberalization and Structural Adjustment Programs (SAPs) in the 1980-90's saw governments withdraw from their traditional involvement in agricultural markets increasingly obligated to do so by the international financial institutions as conditionality for Aid, and more recently by trade agreements such as the WTO. There is wide evidence that poor rural producers have found themselves systematically precluded from these high-value market chains, left to fend for themselves in traditional markets in which prices, as well standards and related requirements, are lower (Reardon & Berdegue, 2002, IFAD 2011). Moreover, the restructuring of markets

and power relations beyond the farm gate has been underreported in the debate about sustainable agriculture and rural poverty.

The alternative method for ensuring farmer participation in these chains would be through exploiting other factors such as reliance on external rather than internal economies of scale through networking or clustering and other forms of alliances. These could be alliances among smallholders or through establishing links between exporters or larger integrated farmers that have already overcome the major barriers to market entry (Kirsten & Sartouris 2002). Some studies have shown that small farmers may gain market access to export markets through different forms of support, which include partnerships with export firms – including contractual arrangements, formation of Producer Organizations (POs) to provide economies of scale and support from Non Governmental Organizations (NGOs) (Minten *et al.* 2005, Henson *et al.* 2005, Narrod *et al.* 2009). The question remains as to whether these arrangements are sustainable in the long run.

This paper lays emphasis on farmer's motivation in participating and remaining in high value chains, despite prevailing high transaction costs and skewed income distributions discussed in previous chapters. The second original contribution of this paper is to determine the various ways in which standards have shaped farmers' participation in these chains through intermediaries and institutional arrangements in the Kenyan context.

6.2 Case study Methodological Approach

6.2.1 Analytical Framework

The starting point for this analysis is that whilst smallholders' competitive advantages over large commercial farms lie principally in their intensive local knowledge and their ability to employ family labour and therefore reduce costs, their small scale leads to higher unit transaction costs in almost all non-labour transactions especially where standards are concerned (as shown in the previous chapter 5). As such, an exploratory analysis of constraints faced by smallholders gives a preliminary contextual enquiry into the production, marketing, information and credit constraints related to meeting and maintaining required standards, which may raise transaction costs and/or or limit their participation in HVCs. In this context, the level and nature of transaction costs are key determinants of market participation coupled with a wide range of other factors such as access to information, assets, and the availability of institutional arrangements that mitigate transaction costs.

Underlying this analysis is the relationships between smallholder farmers and the product, market and the institutional environments. Poole and de Frece (2010) suggested a simple typology of two types of internal initiatives and/or external interventions, and institutional and organisational innovations in commercial agricultural markets in sub-Saharan Africa. Broadly speaking, these innovations are aimed at redressing the management and organisational weaknesses that impair commercial performance and reduce the transaction costs that cause weak or missing markets. This framework may be employed in this case to determine smallholders' motivation to participate and remain in these chains given the constraints, and the institutional mechanisms through which participation is achieved. Finally, the sustainability of these institutional arrangements is analysed by determining the vertical and horizontal arrangements and dynamics and how these affect their cohesion and long term benefits that they provide for smallholders specifically with respect to meeting the required standards for HVCs.

6.2.2 Data and Methods

The study utilized primary data from a survey of participant and non-participant farmers that was carried out February to May 2009. This was also informed by a qualitative research phase between August and September 2009, which included in-depth interviews with producer organizations, exporters, market intermediaries, government and non-governmental institutions. The sampling frame was obtained from the Horticultural Crops Development Authority (HCDA). The survey took place in 9 districts in major horticultural producing areas in Eastern, Central, Coast, Rift Valley and Nairobi provinces. A total of 203 respondents (including exporters) were interviewed in the first round. They included those involved in the production of flowers, fresh fruits and vegetables. The second round of interviews involved 18 key informants from various institutions, and a total of 18 producer organizations and 3 major producer umbrella organizations. Data from 181 smallholders in the horticultural production was used in this section's analysis. A multinomial logistical regression was applied in analysing the determinants of smallholder participation in the various marketing arrangements and their participation in the export market. Variables included the socio-economic characteristics such as age, gender, education and farm size (capital endowments); farm characteristics such as distance from market and number of labourers; market access factors such as access to information and credit and other explanatory variables explained below.

Exploratory data analysis is largely used to describe the nature and characteristics of smallholders in the horticulture sector in Kenya whilst an econometric approach is used to comprehend the determining factors for their participation in HVCs. To augment this discussion, a qualitative analysis of data from key informants was carried out to understand the institutional support mechanisms that exist for farmers and their sustainability in the long run.

6.3 The Kenyan Context

6.3.1 Smallholders in Horticulture HVCs and Their Constraints

Characteristics of Smallholders in the Horticultural Sector in Kenya

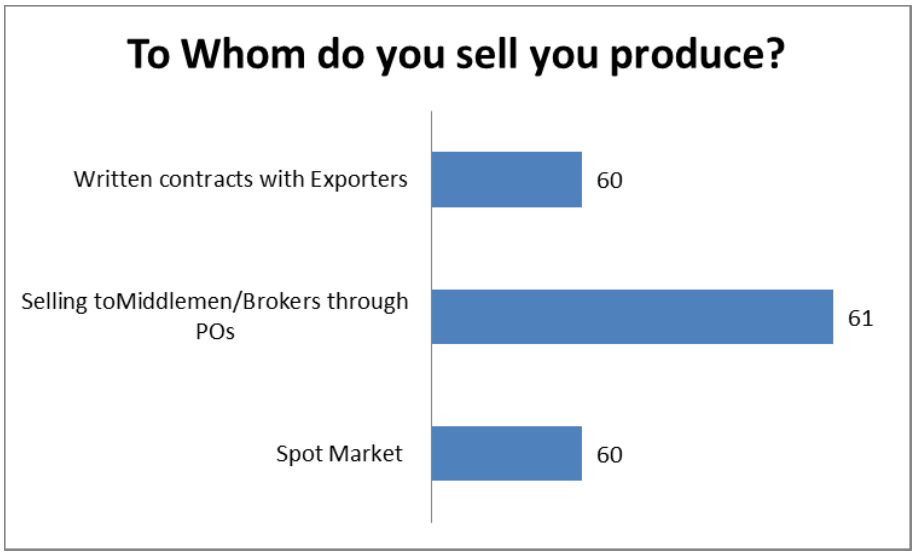
In Kenya, close to 70 per cent of agricultural production is done by smallholders; 65 per cent of horticulture exports and 90 per cent of domestic horticultural production is directly attributed to smallholders. The smallholders in HVCs in Kenya are characterized very small sized landholdings (.25 to 10 ha) whose average is 2.39 acres. Findings from our field survey in 2009 indicated that on average, the area under horticulture is about 1.98 acres. Production is mainly rain fed although 23 per cent of farmers interviewed used some form of irrigation during the dry season. Smallholders in Kenya often employ family labour on their farms and mostly engage casual labourers during the planting and harvesting seasons to reduce the workload. The percentage of farmers who rely on both family and hired labour is 56.3. On average, where 2 family members work on the farm, an additional 2 casual labourers are employed (Table 6.1). Thirty three per cent (33%) of the farmers had written contracts, which specified product quality and quantity including price whilst 28.7 per cent had verbal contractual agreements with various intermediaries. Of the farmers interviewed, 70 per cent belonged to a producer organization (PO) either formally or informally. The average age of respondents was 35.9 years and average years in education are 11.8 years.

Table 6.1: Summary Characteristics of Smallholders in FFV Sector in Kenya (N=181)

Average years in Horticulture export farming	8.5
Average years of education	11.8
Average age of respondents	35.9
Average land holdings (acres)	2.53
Average area under horticulture (acres)	2.19
Average size of labour (Number)	3.9
Per centage farmers using family labour	56.3
Farmers with written contracts	33.1
Per centage farmers belonging to POs	70.1
Per centage farmers with access to credit	25.7

Most of the export products are sold to brokers and middlemen who take 39 per cent of the market share. Thirty three per cent (33%) of the respondents sold their export produce to large and small scale exporters through contractual agreements and 34 per cent sold to the local market and had no prior agreements with exporters or brokers (figure 6.1). Brokers buy from farmers who have organized themselves in producer groups that constitute a very important component in linking farmers to export markets.

Figure 6.1: Summary Market Players for Smallholders in Kenya's Horticulture Sector Value Chain



Source: Survey 2009

Further analysis of the data suggests that 70 per cent of producers belong to (POs). These are key market intermediaries through which farmers organize themselves not only to access markets, but also to be able to lower their costs of compliance with standards (table 6.2). The survey indicates that market access is the principal reason for joining a producer organization and lowering costs of compliance is the second most important reason for joining a producer organization. Respondents also feel that by joining a PO they have a better bargaining power for prices and related quality requirements. POs are also important sources

of information and technology for smallholders' upgrading of their production.

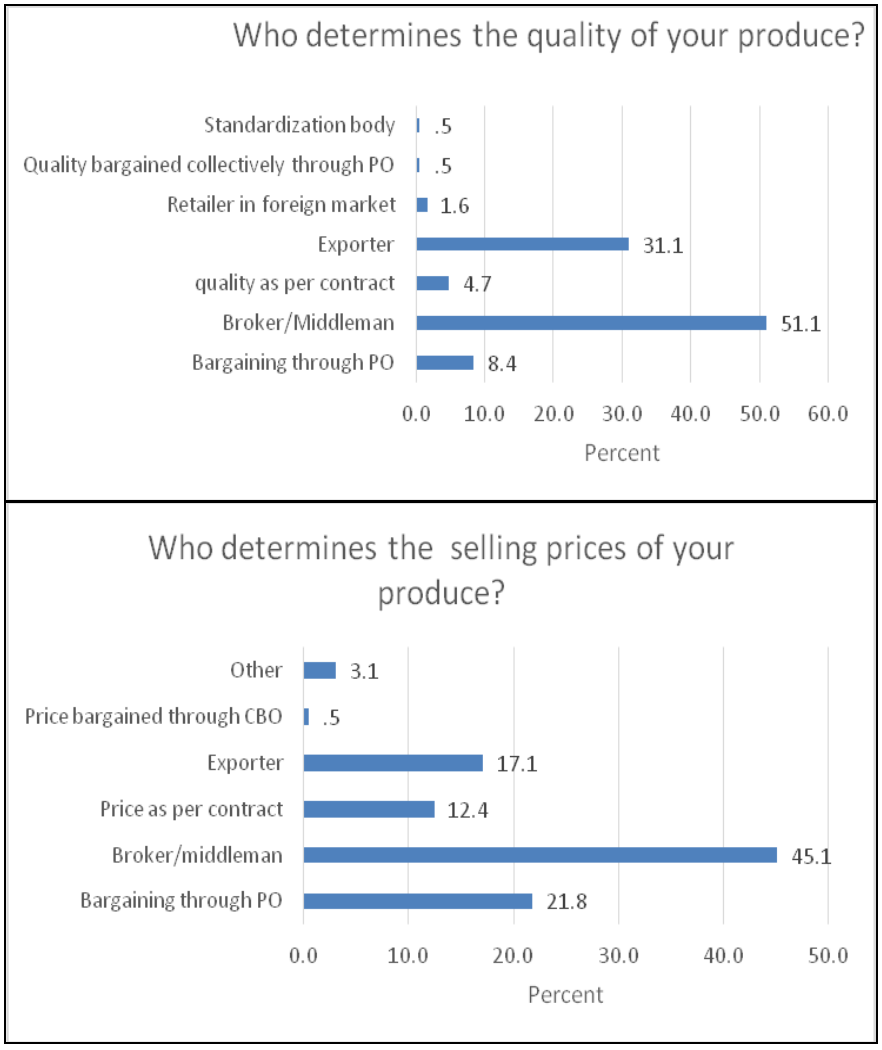
Table 6.2: Smallholders' Reasons for Joining a Producer organization

Reason	*per centage*
Guaranteed market for produce	78
Better negotiated prices	53
Assistance with meeting standards	93
Access to credit (collateral)	51
Access to information	67
Access to technology and capacity building	72.4

***Multiple responses allowed*

As discussed in previous chapters, these chains are governed by numerous standards, which are often costly. On average, the cost of meeting standards for smallholders is about 7-13 per cent of their total costs of production. In addition, the HVCs in Kenya are quasi-hierarchical and vertically coordinated, meaning that nearly all aspects of the chain management - production, transport and marketing, are mostly controlled by the exporters and middlemen. This implies that the smallholders access markets via contracts with exporters or through their POs or through other intermediaries. They have no direct access to markets, which means they have no control of quality specifications or standards (Figure 6.2). Middlemen and brokers seem to have an important role in determining the prices and quality of produce that farmers produce for export. To some extent, POs are important for bargaining for the farm gate prices but not very significant in bargaining for quality specification, as they are already set and there is no room for bargaining.

Figure 6.2: Who Determines Price and Quality of Produce in Kenya's HVCs?



Source: Survey 2009

Constraints Faced by Smallholders in Kenya's HVCs

In Kenya, smallholders dominate agricultural sector and they produce about 65-70 per cent of all agricultural production. In essence their success in farming should tremendously improve incomes and subsequently have a positive impact on rural poverty and development. In the last two decades, owing to the falling prices of traditional export products such as tea and coffee in the world markets Kenyan producers have diversified their exports into non-traditional high value export crops such as fresh fruits and vegetables and cut flowers. However, these high value chains are governed by numerous health & safety; environmental; and labour standards and often, in addition, require traceability. Meeting these standards is a prerequisite for staying in the export business, but at the same time a major challenge because of their dynamic nature and related costs. Evidence suggested that some fresh export vegetable farmers were being marginalized by these requirements (Okello 2005, Maertens 2006) while other studies however found that compliance to these requirements improved increased their incomes (Asfaw, 2009).

Kenyan smallholders who have succeeded in producing for the export market are facing new challenges related to new consumer demand for food quality and safety. European Union (EU) retailers are increasingly demanding that produce be certified according to specific food safety and quality standards (Muriithi *et al*, 2010) all of which require some changes on the part of smallholders. Results from our survey in 2009 gives a number of constraints faced by smallholders as ranging from high cost of inputs, limited access to extension services, lack of irrigation infrastructure, and limited access to direct markets, high costs of meeting standards, information asymmetry and low produce prices among others (Table 6.3).

Table 6.3: Constraints Faced by Smallholders in Kenya's Horticulture Sector (N=181)

Constraint	%Very Severe	%Severe	%Moderate	Not Severe	Not a constraint
Costs of meeting standards	46.0	19.9	13.0	8.1	13.0
Access to information on standards	20.3	12.2	36.2	12.4	18.6
Access to Credit	54.9	17.9	11.0	6.4	9.8
Access to extension services	17.8	13.8	19.0	26.4	23.0
Direct access to Markets	50.9	15.2	14.6	5.3	14.0
Low produce prices	58.5	20.1	11.4	6.7	3.3
Poor Infrastructure	31.8	11.3	21.2	8.7	28.5
Distance to markets	39.1	23.6	19.0	5.0	12.5

Source: Survey Results 2009

From the above table it is clear that the most severe constraints are related to low producer prices, access to credit, access to markets, and those related to meeting standards - in that order. Smallholders felt that they receive very low prices for their produce and the exporters often decide on prices and there have no say. Access to credit is also a major problem facing smallholders as they do not have collateral and are often shunned by regular banks. The findings are that groups of farmers can be given credit only if they are registered, have been in existence for at least two years, and can provide collateral from their produce through their respective lead firms and/or intermediaries. These requirements pose a major challenge for smallholders' access to credit. In addition, smallholders also expressed concern over the costs of meeting standards, which are prohibitive unless they comply under group certification.

In view of these constraints, there are a number of strategies that these smallholders have adopted to mitigate the costs related to meeting standards; some of these strategies include joining a PO. Within these groups, smallholders are able to access information related to meeting standards; access training on technical aspects of meeting the standards; access credit for the initial investments to meet these standards; sharing costs in a pool and obtain contracts with exporters. There are also a number of intermediaries operating in the sector to reduce this burden, some of which include NGOs, middlemen and brokers.

6.3.2 Factors Determining Smallholder Participation in HVCs in Kenya

Given the above characteristics and constraints, smallholders may choose to participate in markets using different intermediaries owing to the benefits they may derive from such participation and also because of logistical and informational benefits that may reduce their costs of transaction. Furthermore, certain household and farm characteristics may influence the access to resources and services and therefore influence the motivation to participate in value chains. Standards may pose a constraint and therefore hinder participation, but in cases where there are certain institutional or organizational interventions, this may be a motivation to participate in HVCs. Therefore, in analysing the motivation of smallholders to participate in high value chains a Multinomial Probit Model (MNPM) is applied. According to survey results, there are three main channels through which farmers will sell their produce:

(i) Spot (local) market
(ii) To brokers/middlemen through POs
(iii) To exporters through contracts

Variable Description

It is expected that small-scale producer participation in the export of FFV is determined by human capital variables, farm characteristics and assets and transaction costs. A critical issue in empirical analysis in this context is that some of the hypothesized variables are not directly observable, for example, expected price and transaction costs and their determinants. Hence there is a need to utilize proxy variables to help control for the effects of these unobservable determining factors (for example David & Han, 2004). The expected relationship between the dependent variables (Table 6.4) and each explanatory variable is presented below. The predicated relationships are based on the series of in-depth interviews with small-scale POs during the qualitative phase of the research and a review of literature from past studies.

Table 6.4: Explanatory Variables of FFV Smallholder Participation in Export Market in Kenya's Horticulture Sector

Variable and Symbol	Unit	Expected sign	Selling to middlemen/brokers through POs n=61	Written contracts with exporters n=60	Spot market n = 60	Significance (t-test)
Gender	M=1, F=2	+	62%	90%	71%	**
Age	Years	-	34.6	37.66	34.8	*
Education	Years	+	11.6	12..5	10.9	
Farm Size (FARMSIZE)	Acres	+	2..13	3.42	2.03	*
Area under horticulture (AREAHORT)	Acres	+	1.6	3.6	1.37	*
Years in Horticulture (YEARSHORT)	Years	+	7.15	9.7	7.28	
Number of laborer's (LABOUR)	Number	+	2.2	4.8	1.8	**
Distance from tarmac road (DISTARMAC)	Kilometers	-	6.7	4.8	12.2	**
Distance from Airport (DISTAIRPORT)	Kilometers	-	89	47	158	**
Belong to a Producer organization	Yes=1, No=2	+	86.5%	91.7%	21	***
Access to information on standards	Yes=1, No=2	+	86.5%	99.3%	68%	***
Access to credit	Yes=1, No=2	+	23%	45%	6%	**
Access to extension services	Yes=1, No=2	+	32%	67%	21%	**

*significant at 10% level
**significant at 5% level
*** Significant at 1% level

According to the demographic characteristics for the data summarized in table 5.3, 33 per cent of smallholders participated in the spot market only, while 67 per cent participated in export markets either through contracts with exporters or through arrangements with POs to sell to middlemen. Of these, 88 per cent of participants in the export markets were male while 71 per cent of those participating in spot markets are female. There is no significant difference in the average age of those participating in export markets either through contract or with POs, and those participating in spot markets. Farmers with contracts have slightly larger farms and tend to have more labourers on average 4.8 against 2.8 for other farmers. There was also a marked difference in the distance from the nearest tarmac roads. The average was much higher for spot market participants; it was the same case for distances to airports. Farmers who have contracts have higher access to credit

because they can often use their contracts as collateral when borrowing from financial institutions. These farmers also tend to have better access to extension services because exporters often have their extension agents monitoring the production processes of farmers with whom they have contracts to ensure compliance with requirements.

The relevant variables for which participation is regressed include both economic and social factors. These variables are hypothesized to explain chain participation and according to literature, would give some expected signs. For instance, the variable *gender* takes the value of 1 for male respondents and zero for female ones. In Kenya, men traditionally manage cash crops, and therefore being male is highly likely to facilitate participation in the export market. The effect of *age*, given in years is likely to be related to the years in horticulture farming and therefore older farmers with more experience are likely to participate in the export market rather than the domestic one. Levels of *education* are likely to influence the ability to decipher information and requirements for the export markets and hence higher levels of education will positively influence participation in export chains.

Other farm characteristics and resource endowments may also influence participation for instance the farm size and area under horticulture given in acres are likely to have a positive effect on participation. The number of labourers in a farm may also positively influence participation because horticulture production is a labour intensive exercise and therefore may influence the ability of a farm to produce for export. Distance from the tarmac road and distance from the airport given in kilometres are likely to have an effect on transaction costs related to transport and hence farmers who closer to tarmac roads and airport are likely to participate in horticulture production for export.

Finally other variables such as access to credit and access to extension services may also positively influence the participation of smallholders in the export markets. Credit may stimulate investments for meeting standards or for the expansion of the area under horticulture while access to extension services may provide vital information needed to upgrade production, meet market requirements or access certain markets. Belonging to a producer organization is a variable that is likely to influence the ability to participate in export markets positively since for most exporters, obtaining a contract and group certification is a pre-requisite and reduces transaction costs.

Econometric Approach

Under the logit model, we assume that that a farmer a farmer participates in the export market if the utility (benefit) the farmer receives is greater with participation and otherwise does not. Let Y_i =1 if the farmer has is participating in the export value chain i and Y_i =0 otherwise. The utility or profitability of participation is hypothesized to be a function of a set of exogenous variables Z. Technology adoption can be characterized as:

Y= X¢g + e ………………………………………………… ..(1)

where g is a vector of parameters and e is an error term that includes measurement error and unobserved factors that affect participation (Amemiya, 1981).The probability of adoption is given by:

$$Prob\ (Y_j = 1) = \frac{e^{\gamma z}}{1+e^{\gamma z}} \text{……………………………………….. (2)}$$

Where e is the exponential function.

In our case the logit model would take the form:

$$Y_{j=\ln\left(\frac{Prob_j}{1-Prob_j}\right)=} \alpha + \beta_1\ x_1\ + \beta_2\ x_2\ + \cdots \ldots\ldots \beta_n\ x_n \text{………. (3)}$$

$\alpha = Intercept$; X_1= Dummy for Gender (1=male); X_2 =Age; X_3 =Education (YEARS IN SCHOOL); X_4= Farm Size (acres); X_5 =Area under Horticulture (acres); X_6 =Experience in horticulture (years); X_7 =Number of labourers (number); X_8 =Distance from Tarmac Road (KM); X_9 =Distance from Airport (KM); X_{10} = Dummy for Contractual agreement (1=yes); X_{11} = Dummy for membership in a PO (1=Yes); X_{12} = Dummy for Access to credit (1=Yes), = μ =Error term.

However the application of the multinomial probit offers several advantages over the logit model. It allows for different degrees of randomness of the utilities assigned to the choice alternatives and accounts for interdependence among them and can accommodate reasonable assumptions about subject's preference structures (Haussman and Wise, 1978). First we can simply admit two alternative choices, i.e

participate in export market (j=1) or not to participate (j=0). Secondly we can then detail the various forms of participation as (participation through contracting or participation through middlemen).

In this paper a multinomial probit estimation procedure is applied based on Thurstone's law of comparative judgment in which the choice probability for a given alternative j from a choice set of C containing K elements. The model assumes that individuals select one of the three mutually exclusive alternatives. The random utility of farmer i, i=1…..N for choice j, j=1….N and formulated as:

$$U_{ij} = \alpha_j + x_i'\beta_j + \varepsilon_{ij} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

Where X_i is a *(KX1)* vector of explanatory variables for individual *i* which may contain individual specific characteristics and alternative attributes faced by the individual (in this case farm characteristics, institutional variables, infrastructure etc). $\varepsilon_i = \varepsilon_{i1} + \varepsilon_{i2} + \ldots\ldots\varepsilon_{iN}$ which is a vector of stochastic terms that are assumed to be distributed as a trivariate (in our case of 3 choices) identically and independently across N individuals with zero mean. Usually this is J regressions one each comparing to the benchmark.

$$U_{ij} = \alpha_j + \beta_{j1}x_{1ij} + \beta_{j2}x_{2ij} + \beta_{j3}x_{3ij} + \beta_{jk}x_{Kij} + \varepsilon_{ij} \ldots\ldots\ldots\ldots \quad (5)$$

Where:

a_j is the intercept in regression involving the difference in utility between option j and option 0 and

β_{j1} is the coefficient on the first explanatory variable in the regression, this applies to β_{j2} to $\beta_{jk\ and}$

X_{1ij}……..X_{Kij} are explanatory variables summarized above

We present the three alternative cases in which the smallholders are faced with more than one choice of participation. They may decide to *participate/sell in spot markets*; or they may also decide to export by *selling to*

exporters through contractual arrangements; or *sell to brokers/middlemen through their producer organizations*.

We take the spot market as a reference. In the specifications below:

$$U_{i1}=a_1+\beta_{11}+\ldots\beta_{1k}+\beta_{12}ProbCONTRACT_i - \beta_{32}ProbSPOT_i+\varepsilon_{i1}\ldots(6)$$

AND

$$U_{i2}=a_2+\beta_{21}+\ldots\beta_{2K}+\beta 22ProbMIDDLEMEN_i-\beta_{32}ProbSPOT+\varepsilon_{i2}\ (7)$$

Where $(\beta_{11}+\ldots\ldots..\beta_{1k})$ $(\beta_{21}+\ldots\ldots..\beta_{2K})$ *and are the range of variables that might affect farmer participation ie, (farmer characteristics, farm characteristics, infrastructure variable, credit, information as outlined above).*

Empirical Results

Table 6.5 below gives a summary of the results from multinomial probit estimates. Among farmer specific characters age does not play a very significant role participation in export markets through any of the choices. Education is also not significant in explaining any of the choices farmers make while exporting, however the variable for gender is significant at 10 per cent level for contracted farmers. A male farmer are most likely to be contracted by exporters and this can be explained by the fact that contracted farmers have to provide evidence of their assets at farm level as a pre-requisite for being issued with contracts. In a patriarchal society such as in Kenya, these assets are predominantly owned by men.

Table 6.5: Multinomial Probit Estimates

J=0 is the reference outcome which is SPOT MARKET						
	J=1 Selling through CONTRACT		J=2 Selling through MIDDLE MEN		J=1&2= Selling through CONTRACT AND MIDDLEMEN	
Variable	Marginal effects (∂y/∂x)	p-value	Marginal effects (∂y/∂x)	p-value	Marginal effects (∂y/∂x)	p-value
Gender (male)	0.032* (0.211)	0.014	0.012 (0.103)	0.121	0.101 (0.102)	0.0132
Age (years)	0.043 (0.036)	0.117	0.013 (0.053)	0.142	0.022 (0.051)	0.113
Education (years)	0.027 (0.107)	0.169	0.014 (0.092)	0.393	0.022 (0.115)	0.321
Farm Size (acres)	0.188** (0.011)	0.012	0.102 (0.027)	0.072	0.211* (0.031)	0.077
Area under horticulture (acres)	0.125*** (0.099)	0.001	0.118*** (0.102)	0.004	0.137*** (0.091)	0.003
Experience in horticulture (years)	0.121*** (0.111)	0.001	0.117** (0.098)	0.012	0.139** (0.871)	0.010
Labour (Number)	0.308** (0.143)	0.015	0.217* (0.165)	0.088	0.287* (0.124)	0.072
Distance from tarmac road (KM)	-0.101* (0.431)	0.065	0.121** (0.315)	0.013	0.118* (0.228)	0.058
Distance from airport (KM)	-0.044 (0.334)	0.121	0.671* (0.062)	0.108	0.087 (0.243)	0.113
Access to credit (yes)	0.242*** (0.113)	0.0001	0.118** (0.157)	0.012	0.299** (0.321)	0.078
Constant	-0.202 (0.161)		-0.293 (0.222)		-0.332 (0.193)	

N=181; Pseudo R^2 *=0.312; LR Chi² (10) = 41.37; Prob > Chi² = 0.004; Log Likelihood = -79.38*

**significant at 10% level*
***significant at 5% level*
**** Significant at 1% level*

Other characteristics such as size of the farm and size of the area under horticulture are significant. The farm size is only significant at 10 per cent level for farmers exporting under contract option. Farmers with larger farms have more land that they can dedicate to horticulture production and therefore more likely to be contracted. The area under horticulture is significant at 1 per cent level for all the options for exporting, the larger the area of a farm under horticulture the more likely a farmer is able to participate in export value chains.

Experience in horticulture which is denoted by the number of years spent in horticulture farming is also very significant variable. This is more significant at 1 per cent level for contracted farmers than for farmers who export through middle men because the more the years one

participates in horticulture production, the better the skills in horticulture production, more experienced farmers have a better understanding of the market landscape and are therefore more likely to be contracted by exporters or to seek contracts with exporters. The number of labourers is also important for contracted farmers at 5 per cent level of significance compared to the other options for exporting where the number of labourers is important for determining participation at 10 per cent. The distance from tarmac roads and distance from the airport negatively influences the ability to participate in export market; this is more pronounced for farmers exporting through middle men. Access to credit is significant at 1 per cent level for farmers who participate in export markets through contracts, access to credit increases the likelihood of being contracted by 24 per cent. This is because these farmers are not only able to secure credit by using their contracts as collateral but they are also able to access the finances required to upgrade their production and meet required standards.

The results of the logit model are not significantly different from those of the multinomial probit model above. Table 6.6 reports the maximum likelihood estimates of the logistic regression model. A closer look at the table reveals that most of the variables have expected sign. Diagnostic tests were used to verify the reliability of the results. Analysis of variance inflation factor (VIF) and contingence coefficients revealed that multicollinearity was not a problem for continuous and discrete variables, respectively.

On farm characteristics, farm size is significant at 10 per cent level but area under horticulture is significant at 1 per cent level ie a unit increase in area under horticulture would increase exports by 9 per cent. Farmer characteristics such as education are not significant but experience in horticulture farming is significant at 1 per cent level.

Table 6.6: Results of the Logit Model

Variable	*Coefficient*	*Marginal effect*	*Std error*	*p-value*
Gender (male)	0.072	0.027	0.184	0.153
Age (years)	0.011	0.016	0.024	0.021
Education (years)	0.068	0.012	0.154	0.214
Farm Size (acres)	0.108*	0.123	0.321	0.062
Area under horticulture (acres)	0.294***	0.134	0.059	0.001
Experience in horticulture (years)	0.104***	0.035	0.108	0.009
Labour (Number)	0.128*	0.031	0.169	0.073
Distance from tarmac road (KM)	-0.297**	0.075	0.131	0.019
Distance from airport (KM)	-0.254*	0.091	0.027	0.066
Contractual agreement (yes)	0.112***	0.073	0.119	0.004
Membership in a PO	0.214*	0.092	0.095	0.074
Access to credit	0.119***	0.105	0.126	0.001
Constant	-0.332		0.257	0.001

N=181; Pseudo R^2 *=0.226; LR Chi² (12) = 48.99; Prob > Chi² = 0.00; Log Likelihood = -81.91*

**significant at 10% level*
***significant at 5% level*
**** Significant at 1% level*

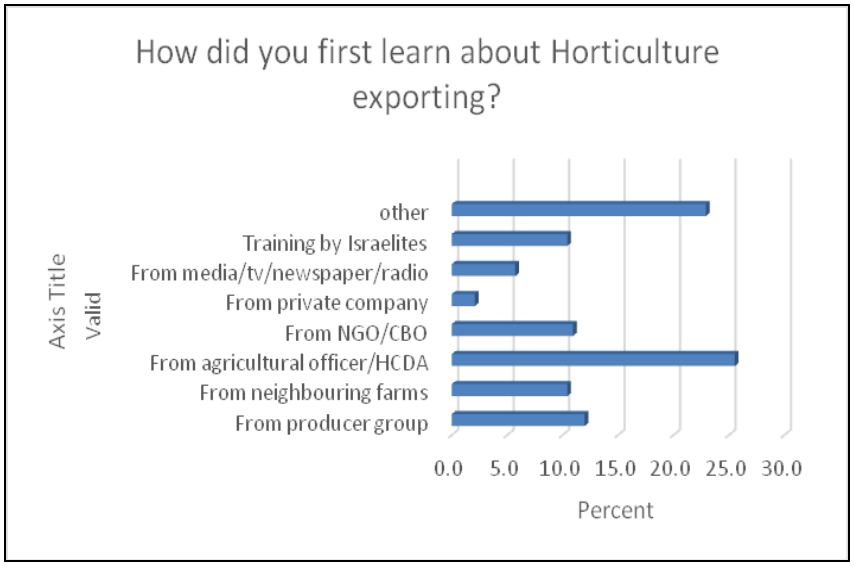
The infrastructure variables which are related to transaction costs were found to be statistically significant and negatively related to farmer participation in export horticulture, the longer the distance from tarmac road the less likely a farmer is able to participate in export markets. This would mean an increase in transaction costs related to transport and time taken in accessing remote villages.

Having a contractual agreement is significant at 1 per cent level as this would increase the likelihood of exporting by 7 per cent. Membership in a producer organization is also significant at 5 per cent level. Access to credit is also significant at 1 per cent level and increases the likelihood of farmer participation in export value chains by 12 per cent. Variables such as education, age and gender are not significant.

6.3.3 Intermediaries for Smallholder Participation in HVCs and Their Sustainability

Inclusion or exclusion is not defined in terms of the farmers' situation at a single point in time, but rather in terms of the capacity of small-scale producers to sustain their participation in a given supply-chain. The initial entry and continued participation of smallholders in HVCs is influenced by the intermediaries in the sector. When asked about how they first learnt about horticulture export, producer groups are seen to play a major role together with extension officers and NGOs (figure 6.3)

Figure 6.3: Key Intermediaries for Initial Participation of Smallholders in Kenyan's Horticulture Value Chain

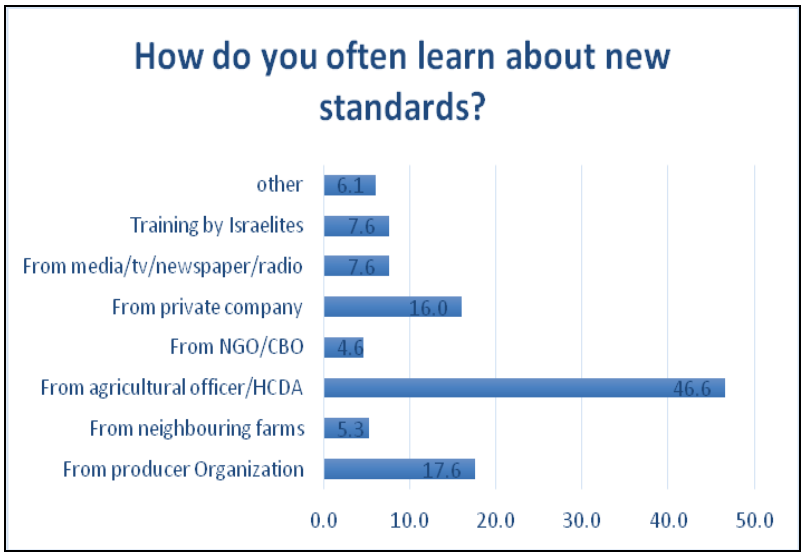


Source: survey 2009

HVCs are evolving and becoming ever more challenging and competitive especially in chains that are largely governed by standards (Vorley, 2001). The structure of Kenya's horticulture value chain is market led; basically because prevailing standards and requirements form an integral part of the chain coordination and control mechanisms used by buyers. Smallholder participation in this chain is always centred on meeting the necessary standards and/or requirements for this market, failure to which farmers are automatically excluded from the chain. Results from the survey indicate that POs are still pivotal in providing

the necessary information on new standards and links with HCDA are also important in providing the necessary information for farmers' continued participation in these chains (figure 6.4). According to the figure HCD is a key intermediary in transmitting standards related information. Producer organizations are also key in transmitting this information to individual farmers after they obtain it from the exporters.

Figure 6.4: Key Intermediaries for Providing Information on New Standards in Kenya's Horticulture Sector



Source: Survey 2009

Given the perishable nature of horticultural produce, and the demand for quality and safety attributes, relationships, networks, skills, and coordination mechanisms are necessary for managing the flow of products between intermediaries and to ensure that the quality specifications are met. In effect, critical success factors for the proper coordination of the horticulture sector include: traceability of produce (farm to fork principle); economies of scale related to initial investments and recurrent transactions for compliance to standards; access to transport taking into consideration the product' perishable nature; access to markets by consistently meeting the requirements for that particular market; dissemination of information to a large number of smallholders

who are dispersed; and ensuring consistent and quality supply of produce from a large number of producers who are differentiated.

Smallholders lack the capacity both financially and technically, to overcome constraints related to meeting these requirements and as a result, market intermediaries are found to be the pivotal element in ensuring smallholder participation in HVCs. This section looks at various mechanisms by which smallholders in Kenya's horticulture sector use intermediaries to overcome constraints and participate in these value chains.

Producer Organizations and Smallholder Inclusion in Kenya's Horticulture Sector

Monitoring and enforcement costs for the buyers tend to be higher because smallholders are often dispersed and differentiated. In addition the traceability requirements of GlobalGAP cannot be fulfilled if small quantities of produce are sourced from dispersed farmers. To overcome this problem, buyers tend to prefer dealing with groups of farmers, which guarantee volumes, quality, and consistency of produce.

In Kenya's horticulture value chain and producer organizations can be traced back to the late 1990s to early 2000's when the standards and requirements for export into the EU reached its peak. Initially, most horticultural produce were sold in spot markets or through middlemen who then sold them to exporters. With rising standards and the need for traceability, a number of things changed, and the entire chain was restructured becoming quasi-hierarchical (as seen in the previous chapters). Due to the high financial costs related to setting up infrastructure and complying with required standards, many smallholders were not able to cope. Subsequently, it is estimated that 40 per cent of smallholders participating in the export sector had to drop out for failure to meet the required standards (Okello et al, 2007), this was further exacerbated by the lack of traceability for buyers which meant that the chain had to be restructured to accommodate these changes.

As a result, buyers developed strategies for reducing transaction costs related to monitoring and enforcement by introducing group certification schemes. These schemes involve groups of farmers clustered in a common location and growing the same or similar export crops. Under these schemes, the groups of farmers are allowed to comply as a unit but only after satisfying requirements of both external

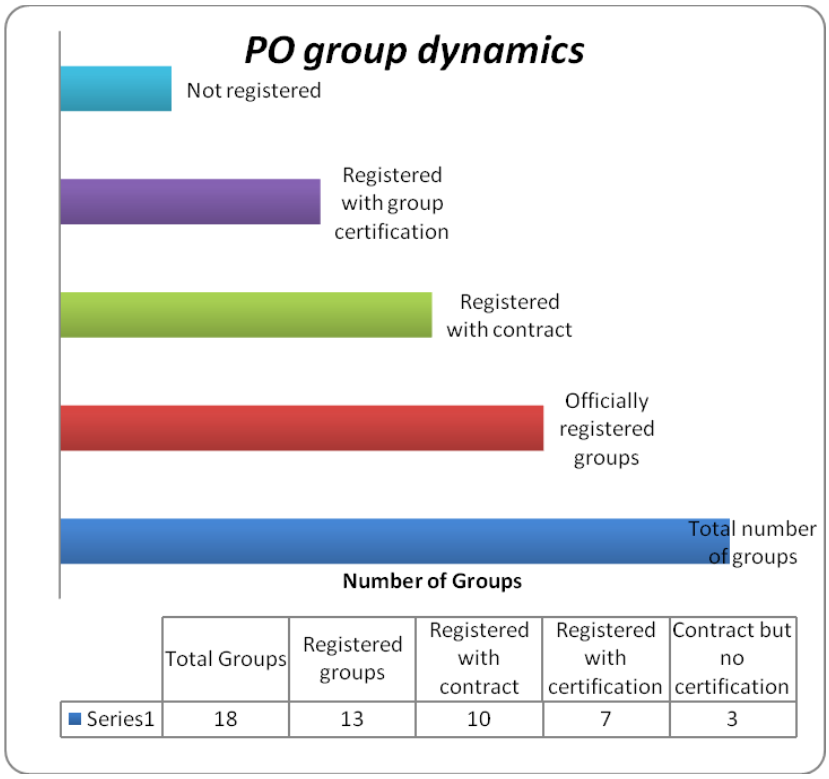
and internal audits (Otieno & Knorringa, 2012). To facilitate this, smallholders come together in groups of 30 or more and have common infrastructure which all members of the group can access. Other requirements imposed by the buyers include minimum acreage (1 acre for each producer), groups should be officially registered and guarantee a certain minimum volume of produce which would be agreed upon in advance. In addition, the buyers provide written or verbal contracts either individually to group members or to the group as a unit. Eventually this phenomenon has been replicated across the sector and has since become the norm.

In the fieldwork survey, 18 groups (POs) (See Appendix 6.1) were visited and out of these, 13 groups were registered, 10 had group contracts and only 7 had valid group certification at the time of the survey. The rest of the groups had failed to renew their group certification schemes (which are renewed yearly) due to financial incapacity. However, FGDs with farmers revealed that a further 3 of the groups that do not have contracts are still able to export through verbal agreements with exporters, some of the groups also sold their produce to brokers/middlemen who then exported them to overseas markets. Furthermore, some groups did not have valid certification but still had contracts to export; these group members were certified individually through their exporters (Figure 6.5).

From the above analysis, POs are not only important for helping farmers to access the requirements they need to fulfil in order to comply with standards but are extremely important for the logistical coordination of the value chain and thus determines to a large extent whether or not a farmer will be able to access the market. In addition, exporters provide various forms of support such as credit for compliance requirements, technical capacity building and logistics for transportation. On the other hand, exporters need POs to be able to coordinate a large number of farmers who are differentiated; ensure traceability and consistent quality and they need the numbers in order to make economic sense when buying from farmers in a specific region. Further interviews revealed that farmer also organize themselves in groups in order to access credit from financial institutions or from exporters and they recognize the importance of POs in guaranteeing collateral. POs also provide an easier avenue through which information

concerning standards or any related market changes is passed down to farmers. Exporters often manage their POs through field extension officers (Table 6.2).

Figure 6.5: Producer Group Dynamics: Registration and Contract Status in Kenya's HVCs



Source: Survey of 2009

Empirical Evidence on Contract Farming in Kenya's Horticulture Sector

Contract farming in Kenya's horticulture sector has been revolutionized by the necessity and requirement to meet export standards. These requirements have hence formed an integral part of these contractual arrangements. These agreements are either done through POs or directly through individual farmers and consist of a written legal contract or a

memorandum of understanding between the parties. Most contracts specify terms such as duration, agreed quantity and quality and terms of payment. Findings from fieldwork in Kenya indicate various 'models' of contracting exist in Kenya's HVCs:

a. The 'centralized model' consisting of an exporter procuring from a large number of smallholders. The cooperation is vertically integrated with services such as pre-financing for inputs, technical support and transport provided by the exporter.
b. The 'multi-patriate model' consists of two or more organizations or intermediaries where the exporter buys from group/groups of farmers that are financed by an NGO, some donor or the government. The NGO would act as the main financier for inputs, meeting technical standards and providing technical support to farmers. The first agreement is usually between the exporters and the farmers, the second one between the exporter and NGO or government and the third one is a Memorandum of Understanding (MOU) between the three parties.
c. Individual contracts were mostly between medium and large scale farmers and exporters.

Obtaining a contract with an exporting firm is not guaranteed and depended on several factors including:

- the size of the farm – farmers with less than an acre under horticulture could not obtain written contracts with exporters;
- the physical and capital base of the farmer – farmers with larger farm who have installed the required infrastructure to meet standards became automatic candidates for contracts,
- a farmers membership in a PO – farmers not belonging to POs only obtained contracts if they had large farms and were able to meet the standards and requirements on their own and;
- the registration status of the PO – POs that are not registered could only get verbal agreements and prices were not agreed upon in advance.
- Presence of internal control mechanisms within the group such as group by-laws.
- The state of infrastructure in a particular areas

Table 6.6: Nature of Contractual Arrangements in Kenya's Horticulture Sector

Type of contract	Specifications	Contract benefits	Per cent
Written Individual contracts between farmer and exporter	• Initial investments in infrastructure for standards should already be established and the farm should be large enough (5 acres and above). • Quality and price specified in advance.	• Lead firms often provide seeds, and may assist farmers with certification costs. • Transport is also provided as produce is sold farm gate.	5%
Written group contracts between farmers and lead firm through their respective POs	• The PO should be registered with no less than 30 members. • Minimum area under horticulture should be 1 acre for each farmer. • Contract run for a year and have quantities and prices specified.	• The lead firm provides support in initial investments for standardization such as a grading shed and provides for a group certification scheme. • Inputs such as seeds, fertilizer and pesticides are provided for by lead firm and deducted from farmer's earnings. • Lead firms provide extension services and closely monitor farmers.	15%
Written group contracts between farmers and lead firms through their POs and intermediaries – often NGOs or larger farmers	• Intermediaries should be registered and certified. Intermediaries often have a number of POs in a certain region. • No minimum acreage required for farmers but a minimum quantity is specified to the intermediary. • Contracts run for a year and have prices and quantity specified.	• Lead firm provides information and may assist with certification costs for intermediaries. • Intermediaries ensure each farmer complies and provide inputs, and collateral for credit. • Farmers are monitored by the intermediary who provides extension services.	8%
Spoken contracts between unregistered POs and exporters	• POs must be committed to supply a specified quantity within a specified time. • Prices are negotiated at harvest time. • Contracts are not binding and both parties can opt out. • The lead firms. • No requirements for minimum farm sizes.	• Inputs such as seeds, fertilizer and pesticides are provided to farmers and deducted from their harvest. • There is no guarantee that the farmer will sell his produce to the exporter with whom they have contracts. • Most often groups of farmers are in need of inputs or other forms of support such as compliance to standards.	5.1%

Table 6.6 above gives a summary of the findings from the survey. It indicates that exporters and lead firms play a major role in ensuring quality throughout the chain. Contractual arrangements provide for seeds, as well as costs of compliance of standards including packaging material in some instances as well as transport costs because produce is

mostly collected at the farm. In addition to this, exporters have undertaken to building structures for producer groups with whom they have contracts. Exporting companies offer extension services including advice on good agricultural practices and training on standards and other requirements. Many of these exporters' functions are subsidised by development donor funding programs such as PIP/COELACP, JICA, GTZ and USAID.

Emerging Innovations for Inter-sectoral Partnerships and Implications for Smallholders Inclusion into the Kenyan HVC

Inter-sectoral partnerships in Kenyan HVCs were observed to be between different entities - government agencies, private sector, NGOs and donors and POs. Each of them has a different role to play in the value chains and most of the roles played are aimed at reducing constraints related to production and markets. In HVCs where there are requirements related to meeting standards, inter-sectoral partnerships are often aimed at providing information, technical assistance and mitigating transaction costs in these chains (Markelova et al, 2009). In some cases these partnerships may also enable producers to negotiate power relationships along the chain and reach more favourable terms of trade (Markelova *et al* 2009; Thorp *et al* 2005).

In Kenya's HVC dynamics in the 1990s, coupled with liberalization in the sector, led to the changing roles of horticultural Crops Development Authority (HCDA)[28]. Initially, the HCDA was mandated with regulation of the sector and marketing roles including price fixing, trade regulation, and operation of processing facilities, extension and capacity building of farmers. However private sector lobby groups (mainly large flower farmers) felt that there was too much interference in the market and their lobby led to the withdrawal of HCDA from the market. In 1995 HCDA functions were trimmed by an act of parliament, to date the organization only performs regulatory functions and provides advisory services to stakeholders. Left with no support, many smallholders were excluded from the market and subsequently these roles were taken up by the private sector and NGOs. These dynamics saw an emergence of various forms of partnerships.

[28] HCDA is a government parastatal whose mandate is to regulate the horticultural industry.

Donor-Private Sector Partnerships for Smallholder Compliance

In Kenya's HVC, the role of private sector in facilitating farmers to meet required standards and to access certification is often purely for profit and the financial obligations for this is met by the farmer through informal credit arrangements with the exporters. Other arrangements were between the exporters and donors, through which exporters apply for funds, which enable them to provide capacity building, technical assistance and infrastructure for compliance to standards including certification to groups of POs who export through them. These arrangements were however found to be unsustainable because when the funding ran out then some farmer organizations failed to renew their certification and were locked out of the market. One such arrangement was the PIP[29]/COLEACP[30] grants which the European Development Fund (EDF) provided. The PIP program focused on maintaining the EU market access for producers and exporters of African Caribbean and Pacific (ACP) countries in the face of changing regulatory and market requirements. It focused its support on small-scale growers and rural women. Through this program, exporters were also able to access capacity building on issues relating to standards and requirements for exporting to the EU (Figure 6.6)

Through these arrangements, farmers were able to receive information relating to standards; relevant training and capacity building; financial support for setting up the necessary initial infrastructure such as grading sheds, pesticide stores, coolers and rest areas; free farm inputs and free auditing and certification. The only condition was that farmers had to belong to a PO that was registered with a minimum membership of 30. The exporters on the other hand also received free training and capacity building on standards and financial support for auditing and certification.

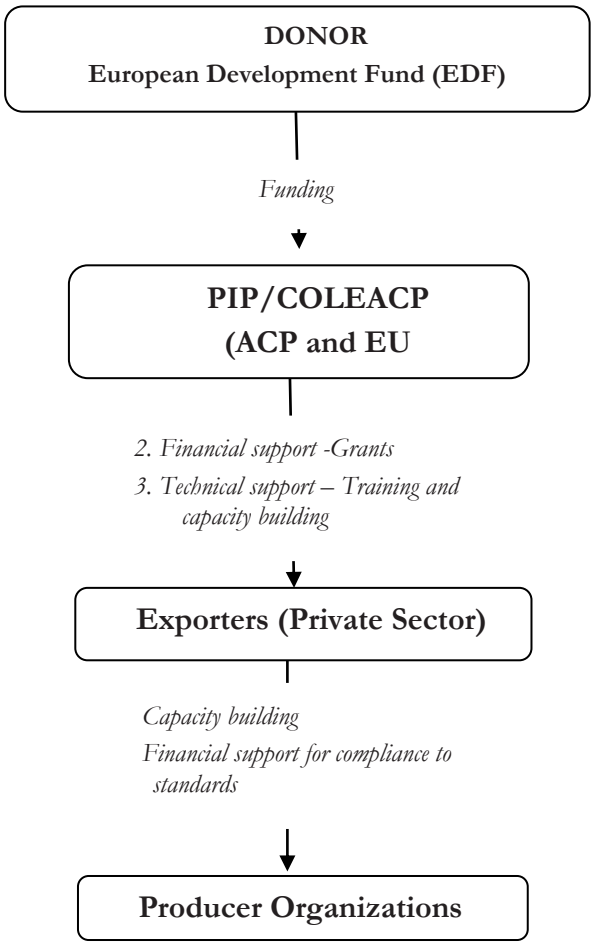
However these arrangements were found to be unsustainable because as soon as the funding ran out, some farmers were not able to afford the annual auditing and certification. During the course of the fieldwork in

[29] PIP is a program financed by the EDF and was established by the EU at the request of ACP countries to prevent the negative effects of regulatory changes in the horticulture export sector.

[30] COLEACP is an inter-professional network of horticultural industry stakeholders in the ACP and EU countries.

2009, six producer organizations had earlier benefited from this program through their exporters, however, when the funding ran out, the producer groups were unable to renew their yearly certification and hence lost their export certificates.

Figure 6.6: Donor-Private Sector Partnerships through PIP/COLEACP



Four of these groups resorted to informal arrangements between the exporters and the smallholders in which the exporters would provide the necessary extension services by carrying out all the required spraying, and

compliance monitoring through their respective field officers. These services were offered to farmers on credit by exporters and deducted from their income at the end of the harvest.

Donor-Government –Private Sector Partnerships

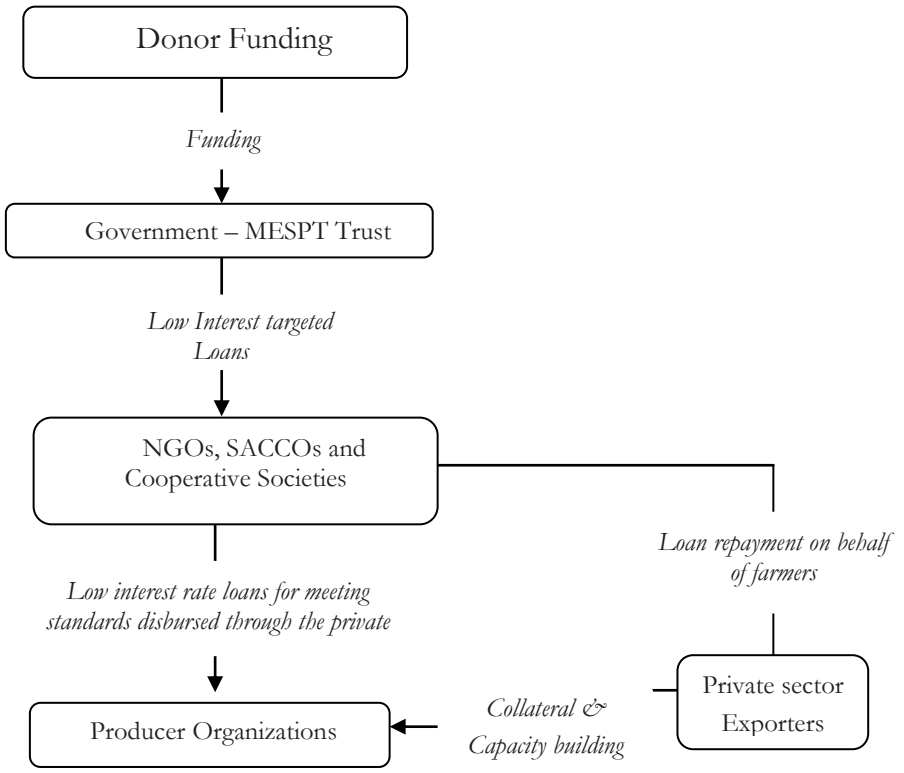
More recently, the government has stepped up its involvement in providing services to the sector through partnerships with intermediaries. In this regard, there are numerous donor-funded initiatives which are given through government institutions[31] for various programs in the horticulture sector. Donor financing in the agricultural sector in the last two years has reached over 6 billion Kenya shillings with horticulture (a priority sector) receiving close to 20 per cent of this funding. Funding is disbursed directly to the target geographical areas for specific programmes such as capacity building, and the installation of the required infrastructures to meeting standards. The government through its extension workers provides the necessary support to the POs who have to be registered (Figure 6.7).

Recent developments in the sector have seen an emergence of new partnerships, which are aimed at increasing the participation of farmers in export markets by providing relevant support systems. One such programme is through the EU funded Micro-Enterprises Support Programme Trust (MESPT) – a micro finance trust whose main objective is to promote economic growth, employment creation and poverty alleviation through support to enterprises. MESPT works with intermediaries that provide financial or business development services to improve the performance of enterprises in all sectors and to all kinds of stakeholders including smallholders. Their aim is to strengthen financial intermediaries in order to establish a strong, stable, market-based micro-finance sector in Kenya. In the horticulture sector, MESPT provides loans to financial intermediaries such as producer Savings and Credit Cooperative Societies (SACCOs) at very low interest rates. These SACCOs then provide loans to producer organizations also at very low interest rates of about 1%. However, to ensure that loans are utilized for the intended purposes and are repaid, the SACCOs form partnerships with exporters in arrangements where exporters will provide capacity building on issues related to standards and set up infrastructure including

[31] Institutions include: ministry of Agriculture, Ministry of trade, ministry of Industry, HCDA, KEPHIS, and more recently micro-finance organizations

costs for auditing and certification. The funding is disbursed directly to exporters by the SACCOS and the POs enter into contracts with both the exporters and the SACCOs. The exporters provide these services to farmers; they provide collateral for the loans and make repayments to the SACCO on behalf of the farmers (Figure 6.7). They also provide market linkages and monitoring and extension services to farmers.

Figure 6.7: Donor-Government- Private Sector Partnerships



During the course of fieldwork in 2009, there were six such arrangements between MESPT and several SACCOs[32]. One such

[32] Taita Taveta Teachers SACCO which at the time had about 10 producer groups with about 300 farmers producing for both export and domestic market; Small and Micro-Enterprise Program (SMEP) which is s micro-finance institution targeting smallholders and SMEs among others.

arrangement involved MESPT and Taita Taveta Teachers SACCO who benefited from a loan of Kshs 10 million for asset and agricultural financing for smallholders. The SACCO provides loans to farmers through their POs which are 53 in number with about 1300 smallholders in both export and domestic markets. This was done in collaboration with two export firms; Vegpro and Patel involved in green beans and mango exports. The conditions for loans to farmers included, membership in a PO; a PO that had a group account with the SACCO; farmers must have a savings account with the SACCO; the farmers must have a written contract with an exporter; and must be in agri-business. The exporters provided necessary infrastructure for standards, training on standards, farm inputs and extension services all of which were paid for by the loan. The exporters also provide collateral in form of income from sales which they remit a percentage to Taita Taveta Teachers' SACCO on behalf of the farmers for repayment of the loan. The interest rates on the loan is 1.5% and farmers are given a grace period of between three months to the time a crop is harvested.

These arrangements have ensured that exporters closely monitor farmers who receive these loans and loan repayment rates were very high at 89 per cent. These types of arrangements were found to be more sustainable even though they involve many players. The changing roles of the private sector and other intermediaries in relatively 'new' forms of collaboration have been highlighted, and they allow otherwise excluded smallholders to participate in the export markets.

6.4 Conclusion

As already demonstrated from previous chapters, the nature of the HVC chain in Kenya is quasi-hierarchical and as such, the buyers/exporters have sophisticated forms of coordination and integration, and rules of participation. As we see in this chapter, the rules of participation in this quasi-hierarchical supply chain dominated by both public and privatised supermarket standards and the rise of contracts and specialised intermediaries are proving to be powerful drivers of divergence and within farming communities. Unlike previous research on standards and smallholders in global value chains, this chapter highlights different dynamics surrounding the constraints, opportunities and sustainability of smallholder participation in HVCs in the south.

First, by their nature smallholders in this chain comprise of 'family' farmers who have traditionally constituted the bedrock of the rural economy. They own small fragmented farms with low levels of capitalization and poor integration with actors in markets. They mainly depend on family labour or seasonally hired labour and hence can effectively participate in high value fruits and vegetable production, which are rather labour intensive. Their constraints include access to finance, meeting market requirements (standards), direct access to markets, low levels of technology, poor infrastructure and lack of information and extension - in that order.

Empirical results on participation are consistent with other studies (Blandon *et al* 2009) in which human capital variables such as age, gender and education are not important in determining participation in HVCs. Rather, farmers who participate in these chains are those who have higher levels of capitalization or bigger pieces of land; more experience in horticulture farming and a larger acreage under horticulture. Most significantly, having a contractual arrangement is very important in determining a farmer's participation in export horticulture. Belonging to a producer organization is also one of the most important factors determining smallholder participation in these chains, this is not only for lowering costs or achieving economies of scale but also mainly for chain coordination. Smallholders who have poor capitalization, low acreage and fewer years in horticulture risk being marginalized. Other factors such as poor infrastructure and distance to markets are negatively associated with participation as these raise transaction costs.

In order to overcome these transaction costs and constraints, various market intermediaries have emerged in Kenya's HVC in a bid not only to improve participation of smallholders in HVCs but also to ensure their sustainability. Findings from the study indicate that various intermediaries perform various functions ranging from reducing transaction costs; economies of scale through collective action; and providing various forms of support services that are otherwise not provided by the government such as extension. Three main forms of intermediaries are predominant in this value chain: contractual arrangements, producer organizations and PPPs.

Contracts are largely being used to organize groups of fragmented producers in a bid to include them in these chains and to ensure consistent quality and quantity specifications as required by market

standards, and to fulfil traceability requirements. As is evident from the analysis, a significant factor in determining participation of farmers in HVCs is the possession of a written or verbal contractual agreement, which gives quality specifications that have to be adhered to. This also provides a framework with which traceability as required by market standards can be ensured along the value chain. Contracts also ensure a guaranteed market for smallholders ad provide a means by which technical advice and credit can be availed to producers by lead firms and hence are seen by many stakeholders as a more sustainable approach towards inclusion of smallholders in HVCs. However there are some indications that the contract specifications required by most lead firms such as the need to have minimum one acre under horticulture and the requirement for a farmer to belong to a registered PO (for legal reasons) may lead to the exclusion of smallholders with lower acreage and a lower capital base. For these farmers, the alternative way to participate in these chains is through POs.

The role of POs in Kenya's HVC has evolved over time with the changing nature and structure of the chain. Requirements for standards and traceability of produce have led to a quasi-hierarchical chain in which strict monitoring is carried out by lead firms. As such, fragmented and differentiated farmers who have limited capital base are organized by their respective POs for ease of coordination and monitoring by lead firms to ensure consistency and traceability. POs have become an integral part of the coordination of these chains as they can now manage and monitor quality. POs offer farmers economies of scale in order to reduce transaction costs for compliance to standards and improve access to credit, they also help improve the bargaining power of farmers for better producer prices and access required technical skills and support for accessing high value export chains.

Liberalization of agricultural markets *relocates risk from the state onto the individual* (McDonald, 1999), and also *elevates the importance of the private sector* and *off-farm capital* as arbiters of sustainability. As is evident in this chapter, the Kenyan government withdrew from heavy involvement in the horticulture sector and only plays a regulatory role. Its roles of extension and information provision, capacity building and marketing have largely been be replaced by direct dealings between farmers and lead firms. Subsequently, forms of intermediaries have emerged with the government playing a facilitating role and donors providing the funds

with which these relationships can thrive. In this chapter, new innovations of collaboration between the government, the private sector and NGOs have not only improved smallholder participation in HVCs, but have also provided access to credit, capacity building and upgrading opportunities for smallholders and linkages between farmers and lead firms. The presence of government in these PPPs also provides a clear regulatory framework within which contracts are governed.

In conclusion, the study has highlighted the implications of smallholder participation in HVCs while taking into consideration the role of standards and the changing industry structure. In these chains transaction costs remain a critical issue coupled with standards and requirements that are used for chain coordination and management. Therefore smallholders will only participate if it makes economic sense to do so and likewise, exporters will only procure from them if it is economical to do so. In order to prevent marginalization and exclusion of smallholders, intermediaries are increasingly becoming important for chain consolidation, monitoring and chain management while at the same time ensuring inclusion of smallholders in HVCs. However, the sustainability of their participation is only dependent on dynamics that will ensure that these relationships are sustainable in the long run. For instance, continued reliance on donor support may not be sustainable unless the links and networks are self-maintaining even without the presence of donor financing. In addition, the strengthening of POs and the redefining of contractual agreements are more sustainable alternatives for smallholder participation.

7 Conclusions and Policy Implications

7.1 A synthesis of findings

This research sought to understand key issues for policy and research with respect to emerging globalization of value chains, the role of standards and subsequent governance structures and how they influence different aspects of development from a developing country perspective. The presumption is that trade is supposed to contribute to poverty and development; however, standards may act as barriers to trade and affect export competitiveness. The approach used for analysis involved seeking specific answers to specific questions at different levels of analysis – macro, meso and micro using a range of methodological approaches with a view that doing so would illuminate in a more enhanced way, the various dynamics related to trade standards and development and thus 'paint' a holistic picture of the realities at different levels and for different players both global and local.

As such the previous chapters provide insights on how the globalization of supply chains, the emergence of standards and their increased consolidation into the governance structures of these chains have led to different developmental outcomes. Furthermore, this approach narrowed the focus of this research to looking at the direct links between standards at different levels of analysis and using different dynamics and case studies. The study did not focus on labor effects but rather directly on the high value chain transactions and its intricacies. This chapter provides a synthesis of findings drawn from various levels of analysis and how these impact on different perspectives of development. Key policy discourses that are relevant for developing countries and their sustainable participation in HVCs

including emerging institutional dynamics are also provided. Finally while each chapter draws its on conclusion based on findings, most importantly this chapter integrates those conclusions into an argument that is plausible and in line with the core argument of this thesis.

7.1.1 Standards and Development: Emerging perspectives

Development can be viewed as a long term process of structural and societal transformation; in the short to medium term, development is viewed as a process of achieving desirable targets and outcomes such as poverty alleviation and raising incomes of countries (Sumner and Tribe, 2008). Classical economists believed economic development could be achieved through free trade, self-regulating markets with limited government intervention (Adam Smith 1776). Half a century later David Ricardo outlined economic development through comparative advantage in which countries gain when they trade in products in which they have comparative advantage. More recently, new trade theories suggest that export competitiveness is crucial in integration in global markets, which is believed to be beneficial for economic growth as a broader development agenda (Baghwati and Srinivasan, 2002, Dollar and Kraay 2002).

As such agricultural trade in Africa; and more specifically horticulture sector in Kenya have continued to play a critical role in economic development and poverty alleviation. Horticulture is one of Kenya's top Foreign exchange earners; it is linked directly with economic development as more than 5 million individuals in Kenya participate in the high value export market including smallholders, large scale producers, labourers, exporters among others. After trade liberalization and removal of tariffs in the early 1990's, trade became freer and there has been a dramatic growth in sector coupled with a dramatic rise of investments in the sector. As is evident from this research; globally, there has also been a rise in retail chains and food markets; these markets are governed by standards and regulations requiring food safety and quality, traceability and ethical production among others.

The proliferation of these standards is a result of: (i) Public concerns on food safety and health (ii) prevention of food adulteration and misbranding – resulting in government regulation and public standards (iii) evolving consumer demands and activism from civil society organizations leading to private standards (McCluskey, 2007). This has resulted in standards and certification requirements that are both public (mandatory) and private (voluntary) but which concern safety, health, nutrition, characteristics, geographic origin, organic status, ethical attributes and traceability as firms try to competitively position themselves in high value chains.

Therefore, understanding the link between standards and development is crucial in designing broader development goals. This is because compliance with standards in global value chains is a requirement and pre-requisite for accessing developed country markets and thus has implications for developing countries.

As is evident in this study, standards are set in the north (developed country markets) and passed down to the south (developing country producers) alongside priorities and requirements of the north (Tallontire, 2007, Blowfield & Dolan, 2008). The standards are also public mandatory (governed by WTO and developed country governments) and in addition, private (voluntary- develop and governed by retailers who have due diligence to ensure that what they sell is safe healthy and meets requirements of their markets. In effect the extent and magnitude of standards is numerous and this has various financial and technical implications for developing country producers wishing to access these markets. Thus, standards have become important tools for shaping and governing global food system and high value chains by determining, what is produced, by whom, where and how it is produced and for whom it is produced. They are also an important pre-requisite for accessing markets in the north and subsequently participating in global high value chains. As a result and as presented in literature and in this study, there are two opposite views of standards from a development perspective.

The first view is that standards is that they are beneficial to developing countries in several ways: they embody technological and informational characteristics that are beneficial to developing country producers as this enables transfer of technology and knowledge spill-overs that allows them to upgrade their production and subsequently become more competitive in globalized chains. Information contained in the standards helps to increase chain efficiency by providing a 'common language' between suppliers and producers and lowering transaction costs related to information asymmetry (Grossman & Helpman, 1989, Wilson & Abiola 2003; Otieno & Knorringa, 2012), making trade more transparent and predictable (Tander and Tilburg, 2007). Most importantly complying with standards allow producers access to high value export markets which provide higher incomes for participating producers thereby impacting directly on poverty and economic development (Maertens and Swinnen, 2007). In this study it is evident that standards have helped thousands of smallholders to upgrade their production either individually or through producer groups and access markets through various options for certification and various forms of intermediaries which help to mitigate transaction costs. Through standards and emerging governance structures of the chains have also helped organize the sector, improve on chain efficiency and reduce transaction costs all of which are positive aspects of development.

The second view of standards and development that can be confirmed from this study is that standards may act as barriers to trade and subsequently lead to exclusionary effects which may affect smaller farmers and thus impact negatively of poverty alleviation and development. Many authors (Jaffe & Henson, 2004; Wilson and Abiola 2003) posit that standards may impede trade by acting as barrier to trade and reduce trade at a macro level, however they may also lead to high transaction costs of compliance especially for developing countries who do not have adequate financial and technical capacity to comply with requirements. Furthermore standards have exclusionary tendencies especially due to the high cost of compliance for smallholders (Gibbon 2003, Reardon &Barret, 2000, Reardon et

al, 1999) and increasing levels of vertical coordination, which favours only a certain 'type' of farmer with larger production and capitalization. However this can also be seen as a step towards increasing efficiency of production in the value chain.

Other aspects of standards and development that are emerging from this study are linked to institutional developments. From a perspective of New Institutional Economics (NIE)(North, 1961), the process of globalization of the value chains and the development of standards has seen a change in social structures (at a micro-level) and the rise pertinent institutions (at meso-and macro level) which are necessitated by – (i) requirements of public or mandatory standards for example WTO's NEPs at macro level (ii) changes in global governance mechanisms which require institutions for monitoring and enforcement at meso-level and even contractual arrangements that ensure compliance and (ii) social micro processes (at micro-level) requiring intermediaries such as Producer organizations which mediate key constraints for smallholders such as transaction costs of compliance, access to credit and inputs and links to markets and contributes immensely to their continued and sustainable participation in high value chains.

Finally and interestingly, the localization and harmonization of global standards as an attempt to enhance the developmental relevance of global standards have seen the translation, adaptation, and customization of different global standards to local conditions. This saw two attempts of localizing standards in Kenya's horticulture sector (Otieno & Knorringa, 2012); the first attempt was the localization of the GlobalGAP (EUREPGAP) standard into KenyaGAP and acquiring GlobalGAP equivalence. KenyaGAP, which gives flexibility on control points and compliance criteria and is inclusive in that it takes into consideration local conditions as well as concerns of local producers. The second attempt was the localization of a public mandatory standard, which was harmonized with US's Environmental Protection Agency (EPA) and UK's Integrated Crop management. While these two attempts provide for local actors a more context sensitive way of certification and chain

management with reduced costs, they still face some key challenges (Otieno &Knorringa, 2012) in the global food systems and have limited success because leading retailers do not have incentives to contribute to the process and other value chain actors are not yet convinced of the relevance of such initiatives. Moreover, their 'acceptance' in markets in the north still remains to be seen.

7.1.2 A synthesis of Empirical findings

The conceptual approach applied to enhance the understanding of the link between standards and development in this study was to use a three persectives and three different levels of analysis of different aspects to determine the degree of congruence (or incongruence) with the standards development debate and determine policy relevance. In doing so we were not only able to analyse the economic impact of standards on export supply level but also to unveil how standards have impacted on other aspects of development not often covered by many authors; such as governance and management systems and how these have subsequently resulted in different outcomes for different stakeholders in the value chain and the social micro processes that determine sustainable participation in these HVCs all of which have policy relevance to poverty alleviation and development.

The trade enhancing or reducing effect of standards was analysed using an export supply response model. This was done in view of other macro-level factors that affect exports such as FDI, GDP, real exchange rates, inflation among others, in order to determine to what extent the constrained trade can be attributed to standards. Findings from this analysis indicate that there is a causal relationship between standards and exports; in the short run, the number of rejections reduces exports while in the long run SPS measures were found to have a reducing effect on export supply. Moreover after running an export supply response model, macro-economic variables such as an increase in exchange rate and inflation have a negative effect on export supply. GDP per capita is also shown to have an effect on export growth.

The second perspective represented a case study analysis of the distributional outcomes of key players and a value chain approach was applied to the green beans sector. The value chain approach used in this level of analysis presents linkages in key activities of the chain and key standards along the value chain. A *filiere concept* was then applied to calculate the distribution of costs and benefits along the value chain. This analysis makes three new contributions to literature on value chains, standards and Development. First, these findings are consistent with findings from previous studies (Gerreffi and Sturgeon, 2003, Konefal et al, 2005, Tallontire et al, 2011) that value chain governance is crucial for management and efficiency HVCs and that standards do shape the way these value chains are governed and managed, the way contracts are drawn and the structure of compliance to standards which influences the distribution of costs and benefits. Findings here indicate that the value chains are quasi-hierarchical with standards flowing from retailers to producers; a strong monitoring and enforcement by retailers and third party certification is part of the chain management system; and subsequently more power rests with lead firms – in terms of setting standards, value chain control and enforcement. Producers are mostly standard takers and costs of compliance are pushed downstream.

The second main contribution of the case study is that of the transaction cost perspective of standards. Standards have led to a shift in competition away from price towards quality (Daviron 2002, Keanne 2003). In doing so there has been an increase transaction costs along the value chain; they act as repositories for rent and subsequently influence the distribution of rent along the value chain (Sexmiths and Potts 2010, Valkila et al, 2010). Analysis from this study reveals that due diligence and compliance lies with exporters and producers and this increases their transaction costs. Costs of compliance are pushed down the value chain. Further results reveal inequalities in terms of distribution of costs among different stakeholders along the value chain with the major cost aspect downstream (about 14-15 per cent by producers and only 1 per cent borne by exporters). Moreover distribution of incomes along the value chain also

confirm the inequalities, producers earn a paltry 3 per cent of the mark up price while exporters earn 33 per cent

Finally , the significance of 'institutions' for governance of value chains is emphasized through evidence which suggests the importance of contracts, third party certification and producer organizations in mitigating some of the costs of compliance. In this study evidence shows that economies of scale and subsequent reduction in costs of transaction are achieved through various mechanisms: obtaining group certification through producer organizations, which reduces costs of complying with standards by 8 per cent. In addition these institutions help increase chain efficiency by providing the avenues through which monitoring and enforcement is done. It is also easier for traceability of produce when farmers have contracts or when they are organized in groups.

The social micro processes of standards and sustainability of smallholder participation in HVCs were investigated. Motivation for smallholder participation in high value chains with high transaction costs (of compliance) is influenced by prevailing market structures and infrastructure (Govereh and Jayne, 2003), farmers' resource endowments, contractual arrangements and collective action (Blandon et al, 2009). This is corroborated by this study's findings that smallholders who participate in Kenya's horticulture value chain are those with higher acreage under horticulture and thus higher capitalization; have contracts with exporters and can access group certification through producer organizations; and are closer to infrastructure which is important for accessing markets such as road networks. Other factors, which aid in eliminating information asymmetry and related costs of transactions such as extension services and access to information, are also important for ensuring continued and sustained participation of smallholders in these value chains.

From the study, the importance of intermediaries for the sustainability of resource poor smallholder participation in high chains is underscored. As evidence suggests that standards in these value chains have led to the marginalization of smallholders who are resource poor. However intermediary organizations – producer organizations, contracts and PPPs have

provided value chain interventions which provide ancillary services to farmers and reduce transaction costs; reduce information asymmetry; link farmers to markets; provide extension and advisory services and even provide easier access to credit; all of which are important elements for overall development and poverty outcomes for farmers participating in these chains and can ensure their sustained participation in these chains.

7.2 Institutional dynamics, intermediaries and the Standards debate

The contribution of NIE to development arises from the recognition that economic actors face a particular problem as a result of imperfect information about the behaviour of other actors in transactions; and institutions play an important role in addressing these problems (North 1995). There are different types of institutional approaches: institutions, institutional arrangements (such as contracts) (Davis and North 1971) and institutional environment i.e. property rights, enforcement mechanisms and power relations. All these provide structures within which economic decisions are made.

From a standards perspective and as is evident in this study, there are three main views of institutions:

- First, institutions are formal written rules as well as typically unwritten (informal) codes of conduct and regularized behaviour that underlie and supplement formal rules. In fact some view rules as 'tools' that allow individuals to solve collective dilemmas. 'Institutions are among the tools that fallible humans use to change incentives to enable fallible humans to overcome social dilemmas' (Ostrom 2005: 125). In this regard, institutions are set up (*at a macro-level*) in order to facilitate the implementation of policies, rules and regulations and hence facilitate coordinated exchange of these goods in the context of standards. From this study, due to the proliferation of standards, there has been a change

in the legal and regulatory institutions, which facilitate the formulation of laws and regulatory environment for standards to be implemented. These are mostly in conjunction with public mandatory standards such as the WTO, SPS and TBT measures, the setting up of national enquiry Points and KEPHIS – to ensure adherence to SPS measures.

- The second view of institutions is from a transaction cost perspective. Transaction costs are involved in the establishment of enforcement of the standards and requirements of the goods being exchanged and the transaction risks are involved because of failure to comply with requirements and hence complete a transaction exchange. These transaction costs and risks arise due to difficulties in obtaining information related to the required standards, or for resource poor economic actors - difficulties in meeting the required standards due to high transaction costs of compliance. The general hypothesis is that institutions are transaction-cost reducing arrangements that may change and evolve with changes in the nature and sources of transaction costs (Doward et al, 2005). They facilitate low cost exchange and resource management (*at a meso –level*) and as such contracts and enforcement institutions play a major role in mitigating transaction costs. Thus an analysis of Kenya's meso-level institutions reveals that; in a quasi-hierarchical structure of the value chain – which are other institutions, contracts play a major role in facilitating exchange between partners; these contracts are enforced and monitored by third party certification agencies. Here power relations also play a major role in determining the relations between actors and how the lead firms use the institutional arrangements to monitor and enforce standards and regulations. In addition, we see the role of collective

action institutions such as producer organizations in mitigating transaction costs for a value chain actors in the lower end i.e. smallholders. These intermediaries are further discussed at the micro-level.

- Thirdly, institutions provide incentives for exchange and resource management (Doward et al, 2005). In this view institutions and institutional arrangements provide social networks within which actors can informally relate their values and conventions. Through collective action actors of similar values and trust collaborate to accomplish an outcome (Sandler, 1992) at a *micro-level*. There is interdependency among participants and without collective action they would all be worse off. Thus in this view, due to the high transaction costs in meeting standards, cost mitigating measures among smallholders have evolved around social networks and collective action. These are informal arrangements but without which resource poor smallholders would be marginalized from participating in export markets. In this regard, intermediaries emerge at the micro-level, as a way of mitigating transaction costs, achieving economies of scale and ensuring sustainable participation of resource poor smallholders in value chains. Institutions at this level are mainly informal, and formed on the basis of trust, cohesiveness and values.

Another major insight on institutions is the role they play in enhancing the technical capacity. Findings here indicate that this role cuts across all the three levels. However the technical capacity needs may differ at different levels for different players. At a macro-level, the role of WTOs trade development facility in providing technical capacity to policy makers in order to implement various trade agreements related to standards such as SPS and TBT measures. Capacity building at meso and micro levels is related to content and context of standards and

requirements for major value chain participants including exporters, smallholders and is mainly facilitated by lead firms together with support from government extension agents, and financed through donor funding. The importance of donors and the various partnerships they have with public and private sector is also underscored in this study.

From the foregoing, in Kenya's horticulture sector, evidence suggests that institutional dynamics occur at all the three levels of analysis. And occur in a certain 'mix' i.e. formal and informal with different functions ranging from technical capacity, legal and regulatory at macro level; coordination, enforcement and monitoring at meso-level; and co-ordination and upgrading at micro-level. Technical capacity function of institutions cuts across all the levels (Figure 7.1). Thus analysis institutions in Kenya's Horticulture sector have significant social and economic functions. Their role have been emphasized in facilitating coordination of the value chains, linking actors and marginalized groups by providing information concerning standards and linkages with markets; and from a transaction cost perspective-achieving economies of scale and lowering transaction costs especially at the meso and micro levels.

7.3 Policy Implications

The debate on trade and development has been going on for the last century or so. It is believed that integrating developing countries in the global trade arena will stimulate economic growth, improve incomes and subsequently lead to development (Dollar and Kraay, 2002). However over the past two decades global trade arena has undergone fundamental changes with a shift from tariff barriers to trade liberalization and an increase in non-tariff barriers including standards. The impact of standards and technical regulations[33] on trade is at the forefront of global policy discussions. Understanding the link between standards, technical regulations, and trade is crucial in the design of broader

developmental goals that can create new opportunities for pro-poor growth (Wilson & Abiola, 2003).

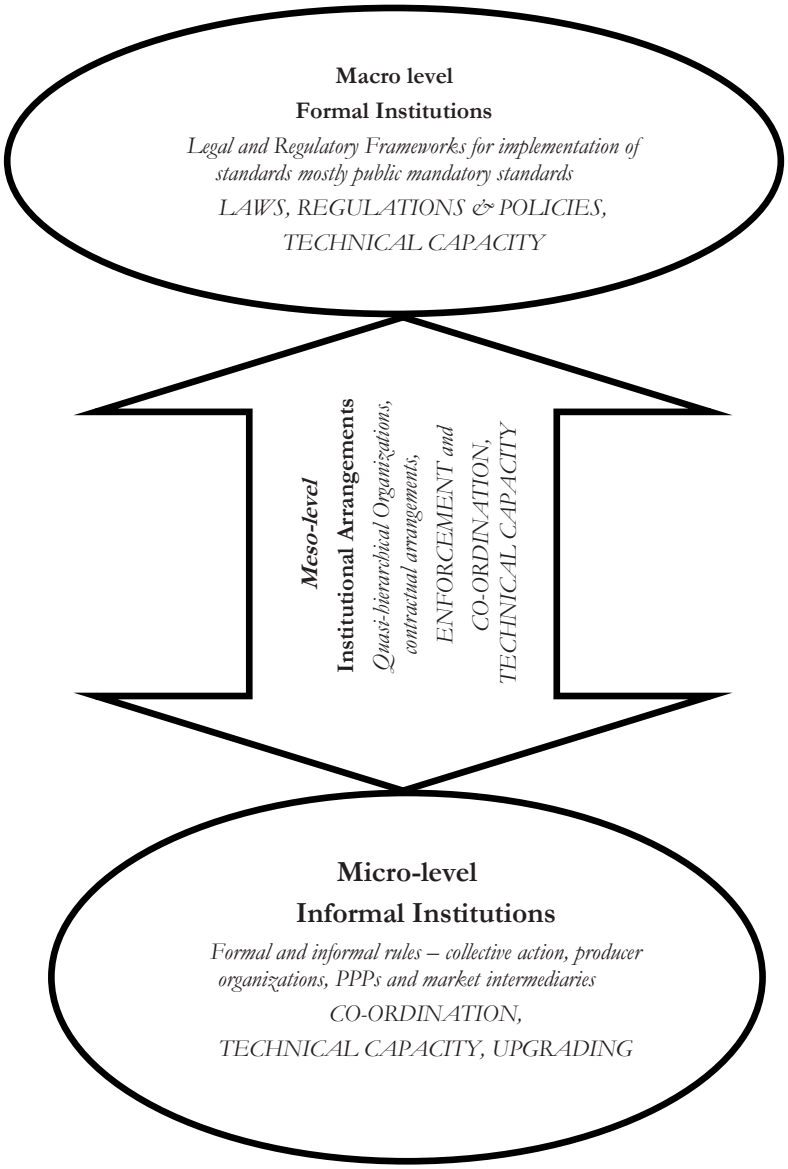
An on-going debate on standards and development has led to two main arguments. First, standards are 'new' forms of non-tariff barriers and therefore result in trade distortions with a trade reducing effect (Maertens and Swinnen, 2007, Athukorala and Jayasuriya 2003). However findings from this study indicate that the magnitude with which standards affect export supply is much lower than other supply side constraints at the macro level. These findings cast doubt on whether standards is the real culprit for reducing trade or whether developing countries have other serious trade reducing factors at a macro-level such as inflation. Of policy relevance therefore is that developing countries may need to address supply side issues at macro-level in order to enhance their trade volumes alongside dealing with non-tariff barriers such as standards.

The second argument is that standards lead to high transaction costs, and this together with increasing levels of vertical coordination may lead to the exclusion of resource poor farmers from competitively participating in these chains and becoming marginalized (Gibbon, 2003, Key and Runsten 1999, Swinnen, 2007). The critique also points out that the distribution of rents in these chains is not equitable as a large portion of the profit is extracted by large multinationals. While this may be true to some extent, findings from this study indicate that standards do increase transaction costs, but further goes to unravel the distribution of outcomes along the chain; the costs are mostly borne by lower end producers while the benefits are mostly reaped by high end retailers and exporters along the chain. This raises an important policy issue concerning the way standards are used to govern value chains, the power relations in these chains, and how these shape the distribution of economic benefits in these chains. Another important insight from this study is that various institutional arrangements and intermediaries that mitigate transaction costs and help them to achieve economies of scale facilitate the participation of resource poor smallholders in these chains. The developmental relevance of intermediaries i.e. contracts and producer organizations is emphasized as key

institutions for linking farmers to markets, obtaining information related to these markets and subsequently facilitating their participation in the global trade arena.

Finally, another important finding of policy significance in agricultural development in Africa is the importance of institutional changes occurring as a result of standards. Past studies (Wilson and Abiola, 2003, Jaffe and Henson 2005) show that developing countries lack institutional and technical capacity to comply with standards and this essentially locks them out of the global trading system. However, findings from this study indicate that institutional developments related to standards not only provide technical and capacity building to implement international requirements, but they also act as important intermediaries in facilitating not only compliance to requirements but also help to mitigate transaction cost effects of standards, economies of scale, information and are important for value chain coordination, enforcement and monitoring. The successes of the above high value export chains and subsequent sustainable participation of smallholders in export markets is highly dependent on prevailing institutions and intermediaries.

Figure 7.1: Institutional changes and standards in Kenya's Horticulture



7.4 Conclusion

The impact of standards on poverty and development has been on the global trade-poverty debate for the past few decades. And

while numerous studies have looked at different issues related to standards, poverty and development; this study specifically from different perspectives of Kenya's horticulture sector has shown that shown that there are many counter- arguments to the notion of standards acting as non-tariff barriers to trade and restricting trade; and the general view that standards act as dis-incentives to resource poor smallholders and thus causes exclusion, the study has re-affirmed the importance of institutions and intermediaries for inclusion of smallholders in export value chains. Furthermore, the study has also confirmed the view that there exists a standards divide – where developing country producers are standard takers and power relationships in quasi-hierarchical chains governed by standards lead to inequitable distribution of outcomes in value chains.

Although the study has contributed to a number of policy findings which can contribute to useful changes in the standards-poverty debate. The study is not without its limitations; first the study did not look at the standards- labour-poverty discussion or standards- welfare effects discussion in which labour or ethical standards may contribute to and enhance incomes and welfare effects, which are linked to development. The study also did not look at technological and innovation related arguments concerning standards and their contribution to upgrading and subsequent competitiveness. These aspects have been widely discussed by other authors.

8 Appendices

Appendix 1.1 : Questionnaire : Producers & Exporters

A GENERAL INFORMATION

1.1 Name of Respondent (Optional) _____ *1.2 Designation*_____

1.3 Name of Firm/Farmer (Optional)_____

1.4 Address of Firm/Farmer _____

*Telephone*_____

E-mail address_____Website_____

1.5 Type of Firm 1. Exporting 2. Production 3. Production and Exporting 4. Packaging 5. Distribution 6. Other (specify):_____

1.6 Year of Establishment _____

1.7 Year of Inception of Horticulture Production _____

1.8 Legal Status of Firm 1. Sole Proprietorship 2. Partnership 3.Private limited 4.Other (specify):_____

1.9 Ownership 1. Foreign 2. Joint – foreign and local 3. Local

1.10 Total Land Holdings (Acres)_____

1.11 Area Under Horticulture (Acres) _____

1.12 Number of Employees

1. Permanent _____
2. Casual _____
3. Family Labor __ Number of Family Members _____

1.13 Location of Farm

1. Distance from all weather road _____
2. Distance from main road _____
3. Distance from tarmac road _____
4. Distance from airport _____

B OUTPUT

2.1 What are the main products produced and

Product	*Area Under Cultivation*	*Quantity Produced Last Month*	*Farm Gate Price*	*Price Last Month*	*Quantity Last Quarter*	*Price last Quarter*	*Quantity Last Year*	*Price last year*
Fresh Fruits (specify):---------- ------								
Vegetables (specify): ---------- ---------- --------								
Flowers (specify)								

2.2 To whom or where do you sell your products?

Sources	*Quantity*	*Price*	*Contractual Arrangement?* *Yes* *No*
Large Scale Producer(specify) –			
Exporter (specify):			
Broker (specify):			
Producer Organization			
CBO/NGO			
Direct to Export Market (specify):			
Local Supermarket			

Packaging/Distribution Firm (specify):			
Other (specify):			

2.3 Who determines the Prices of your products?

1. Bargaining (with whom) specify:_____
2. Broker
3. Price as per contract
4. Exporter/distributor
5. Retailer in foreign market
6. Price bargained through Producer Organization/CBO/NGO
7. Other (specify): _____

2.4 Are Prices pegged on Quality?

Yes

No

I don't Know

2.5 If Yes in 2.6 above, What aspects of Quality determine prices

1. _____

*2.*_____

3. _____

2.6 Who determines Quality specifications of products?

1. Bargaining (with whom) specify:
   _____
2. Broker
3. Quality as per contract
4. Exporter/distributor
5. Retailer in foreign market
6. Quality bargained collectively through PO/NGO/CBO
7. Standardization body (specify):
   _____
8. Other (specify):
   _____
   ___

2.7 How is quality determined?

Inspection by KEBS

Inspection by KEPHIS

Inspection by KEBS

Inspection by private firm/exporter/broker

Inspection by CBO/Producer organization

Other (specify)

1. Are you consulted when selecting quality parameters?

Yes

No

2.10 Has your business experienced

1. Reduced profitability/incomes?

2. Increased profitability/incomes?

3. Remained constant over the past few months?

2.11 What are the reasons for 2.8 above?

1. *Increased / farm gate prices* _____
2. *Improved access to markets*_____
3. *Improved access to inputs (specify):* _____
4. *Upgrading and value addition (specify):* _____
5. *Other*_____ *Specify:*_____

2.10 Do you perceive prices you receive to be

1. Low
2. Fair
3. High
4. Don't know

2.11 What are the reasons for 2.10 above?

1. _____
2. _____
3._____

2.12 Which is the main market for your products?

1. Local Markets/supermarkets (specify): _____
2. Exports to the EU (specify): _____
3. Other exports (specify): _____

2.13 What are the main constraints in accessing this particular market? (rank in order of importance)

1. Stringent standardization and requirements (specify): _____
2. Distance to the markets/transport costs
3. Poor local infrastructure –roads, electricity, refrigeration
3. Exchange rate
4. Trade related taxes (specify): _____
5. Competition from other producers/large firms
6. Others (specify):

_____
_____
_____

2.14 What are the pre-conditions for exporting into a certain market/joining a certain chain?

1. _____
2. _____
3. _____

2.15 What are the standards and quality requirements to access the particular market? (Answer if you have selected 2 above)

Standard	Product	Specifications	Requirements /certification	Initial cost for certification	Recurrent Costs for Inspection and renewal	Inspection by whom?
EUREP-GAP						
Fair Trade						
Labor Standards						
Environmental Standards						
Health Standards						
Safety and Health Standards						
Maximum Residue Limits						
Traceability – Bar Coding						
Labeling Requirements						
Other (Specify)						

2.16 What production and related activities are carried out by your farm/firm?

Activity	Product			Labor Requirements		Cost/Unit labourer
	Present	3yrs ago	5yrs ago	Skilled	Unskilled	
1. Production						
a. Seed selection						
b. Planting						
c. Weeding						
d. Irrigation						
e. Harvesting						
f. Other (specify):						
2. Cutting, trimming, dicing						
3. Preservation /refrigeration/cooling						
4. Packaging						
5. Labeling						
6. Bar coding						
7. Transportation						
8. Distribution						
9. Marketing						
10. Others (specify):						

2.17 Are any of the above activities (upgrading) part of the requirements for accessing the market?

(specify):

_____
_____
_____

C. INPUTS AND RELATED COSTS

input	Direct Cost (Kshs)			Indirect Costs		
	unit	cost	total	unit	cost	total
1. Establishment costs						
a. Licensing						
b. Equipment						
c. Green houses						
d. Others (specify):						
2. Direct inputs						
a. Land						
b. Seeds						

1. Labor						
a. Permanent						
b. Casual						
c. Total						
2. Licensing (specify):						
a.						
3. Electricity						
a. Refrigeration and cooling						
4. Water						
a. Irrigation						
b. Water supply through Municipality						

5. *Information*						
a. Internet						
b. Telephone						
c. Newsletter						
6. *Packaging*						
a. Packaging Materials						
b. Equipment						
c. Labeling						
d. Bar-coding						
e. Other(specify):						
9. Transport						
a. Air Transport						
b. Road Transport						

c. Other (specify):						
10. Marketing and Promotion						
a. Market information						
b. Advertising						
c. Exhibitions and Trade Fairs						
d. Branding						
e. Others (specify):						
11. Insurance						
(specify):						
a.						
b.						
c.						
12. Trade related Taxes						
(specify):						
a.						

b.						
c.						

1.2 In your opinion has the cost of production increased / decreased over the last

One year

3 years

10 years

4. Don't know

Is the increase/decrease commensurate with prices received/profit margins?

Yes

No

Don't know

What are the strategies taken for reducing costs/economies of scale?

Joining a producer organization

Pooling resources with other farmers (informally)

Contracts with producers/ larger exporters

4, Others (specify): _____

D EXPORT SUPPLY CONSTRAINTS

constraint	Rate on a Scale of 1-5			
	present	Last year	3years ago	10 years ago
1. production Related Constraints				
a. Access to water				
b. Cost of Inputs				
c. access to quality seeds				
d. Inadequate Technology				
2. Infrastructural Related Constraints				

Constraint & rating				
a. *access to electricity and cooling facilities*				
b. *Poor road network*				
c. *access to freight*				
d. *cost of transport*				
e. *delays in transport of produce (specify):*				
2. *labor*				
a. *lack of skilled labor*				
b. *cost of labor*				
c. *availability of labor*				

3. *axes and related constraints*				
4. *constraints related to meeting standards*				
5. *constraints in accessing Markets*				
6. *access to credit and related financial services*				
7. *access to Information*				
8. *access to extension services*				
9. *policy environment*				

E NETWORKS, AGGLOMERATION ECONOMIES, AND INSTITUTIONAL SUPPORT

5.1 Do you have a contract?

1. Yes _____ Duration _____

2. No

If Yes go to 5.1.1 if NO go to 5.2

5.1.1 What is the type of contract?

1. Written

2. Spoken

3. Other (specify):

5.1.2 With whom is your contract?

1. Producer Organization (specify):_____

2. Exporter _____

3. Broker_____

4. Distributor _____

5. Overseas supermarket (specify): _____

6. Local Supermarket _____

7. Other (specify): _____

5.1.3 What are the contract terms/specifications?

_____
_____
_____
_____
_____
_____

5.1.4 What are the costs related to obtaining and renewing and breaching a contract?

1. Obtaining _____

2. Renewing _____

3. Breaching _____

5.1.5 Do you have a say in the terms/specifications of the contract?

1. Yes

2. No

5.1.6 Specify:

1. Prices

2. Quality specifications

3. Time/duration

4. Legal specifications of contracts

5. Other (specify):

5.1.7 Services offered by contract (tick all that apply)

Credit

Seeds

Pesticides and fertilizer

Training

Upgrading

Costs of compliance to standards

Extension services

Transport

Information

Promotion and marketing

Guaranteed market access

5.2 Do you belong to any groups/producer organizations?

1. Yes

2. No

If Yes go to 5.2.1 if No go to 5.3

5.2.1 Specify groups/organizations

1. Producer organization(s)
*(Specify)*_____
_____
_____
_____

2. Informal group

3. Fresh Produce Exporters Association of Kenya (FPEAK)

4. KENFAP

5. Community Based Organization
*(Specify)*_____
_____
_____

6. Others
*(specify):*_____
_____
_____

5.2.2 How large is the membership and how much is the fees? (Specify for each group)

Group	*NO. Of Members*	*Membership fee (annual)*	*Onetime payment*
Pproducer Organization(s)			
Iinformal Group			

FPEAK			
KENFAP			
CBO			
Others (s)			

5.2.3 How does the producer organization raise its funds?

1. Assistance form Government

2. Assistance from CBOs and NGOs

3. Assistance from Private firms

4. Contributions from Farmers

5. Others (specify):
_____
_____
_____
_____

5.3 Do you bear the costs for risk and responsibility of goods until they reach the buyer?

1. Yes

2. No

3. Don't Know

If yes go to 5.3.1

5.3.1 Are the risks or responsibilities for goods specified in the contracts/Incoterms?

1. Yes

2. No

3. Don't Know

If Yes go to 5.3.2

5.3.2 What type of incoterm do you have with your buyer?

1. Ex-works -buyer collects goods from your farm/firm

2. CIF – you transport goods to market and are responsible for cost of freight and insurance

3. FCA – you hand goods to a first carrier specified by your buyer (name of carrier)

4. CIP- Cost Insurance Paid- you pay transport costs but risk and insurance are paid by buyer

5. DDU – Delivered Duty Unpaid – you deliver the goods to its destination and buyer pays duty and clearance fees

6. DDP – You have to pay for delivery of goods to your buyer's destination

5.4 Approximately what are your costs for freight and insurance if any?

_____
_____
_____

5.5 Support Services Offered by Specific Groups/Institutions (Tick all that apply and rate on a scale of 1-5 (Very good-very poor))

Services Offered									
	Credit	Inputs	Transport	Testing and Certification	Training	Research and Extension	Upgrading and Technology	Market/Standards Information	Market Access
Producer Organization(s)									
1.									
FPEAK									
CBO(s) (Specify)									
1.									

GO(s) (Specify):									
HCDA[1]									
Ministry of Agriculture									
Ministry of Trade									
KARI[2]									
KEPHIS[3]									
KEBS[4]									
Private Company(ies)									

[1] HCDA – Horticultural Crops Development Authority

[1] KARI – Kenya Agricultural Research Institute

[1] KEPHIS – Kenya Plant Health Inspectorate Services

[1] KEBS – Kenya Bureau of Standards

5.6 Rate the Following institutions in Terms of Quality, Affordability and Accessibility of their services

(Rate on a scale of 1-5 (Very good-very poor))

Services Offered			
	Quality	*Accessibility*	*Affordability (Don not tick if Services are Free*
Producer Organization(s) *1.*			
2.			
3.			
FPEAK			
CBO(s) (specify):			

1. *2.* *3*			
NGO(s) (Specify): *1.* *2.* *3.*			
HCDA			
Ministry of Agriculture			
Ministry of Trade			
KARI			
KEPHIS			
KEBS			
KIRDI			

Private Company(ies)			
1.			
2.			
3.			

5.7 Do you pay for any of the above services?

1. Yes (specify):

a.
_____
_____
_____

2. No

5.7.1 If so approximately how much?

Specify for each item:

_____
_____
_____
_____

5.8 How would you rate the cost of the above services? Rate on a scale of 1-5 ranging from(too expensive to too cheap)

FINAL REMARKS

THANK YOU FOR YOUR TIME

Appendix 1.2: Interview Guides for Government, Quasi-Government Institutions and Producer organisations

SECTION A GENERAL INFORMATION

1.1 Name of Respondent (optional)

_____

*1.2 Designation*_____

1.3 Name of Organization

_____

1.4 Address of Organization

_____

*Telephone*_____

*E-mail address*_____

*Website*_____

1.5 Type of organization (tick as applicable)

*1.Government Ministry (specify):*_____

2. Parastatal

3. Research Institution

4. Regulatory Institution

*5. Standards Certification or Accreditation*_____

*6. Other (specify):*_____

1.6 Year of Establishment _____

1.7 *Status of Organization*

1. Full Government

2. Quasi - government

3. Private

*3. Other (specify):*_____

SECTION B: MANDATE AND FUNCTIONS

2.1. *What are the core functions of your organization? (tick all that apply)*

Service Provided	*Specify*	
1. Policy Formulation		
2. Legal and Regulatory Frameworks (implementation)		
3. Standards Setting/Harmonization		
4. Testing and Certification		
5. Research and Extension		
6. Information Dissemination		
7. Contract Enforcement		
8. Marketing / Promotion/ Branding		
9. Insurance Services to Farmers		
10 . Representation of Farmers in Policy Round Tables		
11. Others (specify):		

1.2

What is your role in the process of standardization testing and certification?

_____
_____
_____
_____
_____

1.3 With whom do you coordinate to fulfill your functions/core mandate?

_____
_____
_____
_____
_____

Are you directly involved with exporters in the sector? How? (specify):

Training and capacity building

Providing information on standards

Providing information on markets

Testing and certification

Linking farmers to markets

Others (specify)

Are you directly involved with farmers or producer organizations? (specify):

Training and capacity building

Providing information on standards

Providing information on markets

Testing and certification

Linking farmers to markets

Others (specify):

1.4 According to your knowledge what standards are complied with in the sector?

_____
_____
_____

1.5 What are the compliance and certification processes in the sector? (elaborate):

_____
_____
_____
_____

What is the cost of compliance and certification?

Compliance - elaborate processes including upgrading

_____
_____

1. Certification (elaborate):

_____
_____

2. Accreditation (elaborate):

1.6 What is your perception on this cost?

_____

1.7 What steps are necessary or are required to receive certification or renewal or accreditation from a standards body?

_____
_____
_____

1.8 Who pays for this requirements?

_____
_____
_____

1.9 What are the various arrangements for smallholders in order to meet these standards?

_____
_____
_____

SECTION C: POLICY AND REGULATORY/INSTITUTIONAL ENVIRONMENT

2.1 How would you describe the institutional environment for the standardization process in Kenya? (favorable/unfavorable) explain:

_____
_____
_____
_____

2.2 What role (if any) do you play in assisting small holders to comply with standards?

_____
_____
_____
_____

2.3 Do you play any role in the formulation, harmonization or implementation of standards? Specify:

_____
_____

_____
_____
_____

2.4 With whom do you coordinate the above mentioned roles?

_____
_____
_____

Appendix 3.1: Summary Key Institutions Interviewed in the Horticulture Sector

Government	Quasi-Government	Producer groups	Donors and NGOs	Financial Institutions	Standards Bodies
Ministry of Trade	Kenya Plant Health Inspectorate Services (KEPHIS)	Fresh Produce Association of Kenya (FPEAK)	Techno-serve European Community DANIDA	K-REP Bank Equity Bank Taita-Taveta Teachers SACCO	AFRICERT SGS KenyaGAP GLOBALGAP
Ministry of Agriculture	Horticultural Crops Development Authority (HCDA)	Kenya Flower Council (KFC)	JICA SIDA	Small and Micro Enterprise Support Programme (SMEP)	
Ministry of Transport and Communication	Kenya Bureau of Standards (KEBS) Exports Promotion Council (EPC) Kenya National Chamber of Commerce and Industry (KNCCI) Micro-Enterprise Support Programme Trust (MESPT) Assistance to Micro and Small Enterprises Programme (ASMEP)	Kenya Association of Manufacturers (KAM)	Action Aid Kenya USAID		

Source: *Survey results 2009*

Appendix 4.1: Specific Standards Compliance for Kenya's Horticulture Sector Exporters

Category	Classification/Category
WTO Sanitary and Phyto-sanitary Measures	A100 prohibition or restriction of products for SPS reasons A110 – Temporary geographic prohibition for SPS reasons A120 –Systems approach A150 –Registration requirements for exporters A200 – Maximum Residue Limits (MRLs) A210 – tolerance limits for residues or contamination by certain substances A220 – Restricted use of certain substances in foods A300 – Labeling requirements A320 –Marking requirements A330 – Packaging requirements A400 – Hygienic requirements A410 Microbial criteria A420 good hygienic practices and water quality requirements A600 - other requirements on production or post production A800 – conformity assessment related to SPS A810 – product registration A820 – Testing requirement A830 – Certification requirement A840 - Inspection requirements A840 – Traceability requirements
TBT Measures	B150 – Registration requirements for TBT reasons B200 – Tolerance limits for residues and other substances B220 – Restricted use of certain substances B300 – Labeling marking and packaging requirements B400 – Production or post production requirements B700 – Product quality performance requirement B800 – Conformity assessment
Private standards	Global GAP ISO 9000

	British Retail Consortium (Covers Tesco's and M&S,)
	Max Havelor
	Food safety system certification 22000 based on ISO 22000:2005
	International Food Standards (IFS) also based on ISO 22000
	SA 8000

Source: Author 2015

Appendix 5.1: Production costs per acre (4046.86m^2) per year for an individual smallholder under option 1 certification

Production Costs	Kshs	*Euros***	Totals/year (4 seasons)
Fixed Costs			
Equipment*	100,000	980.39	
Total		**980.39**	**980.39**
Variable Costs (Per season/acre)			**Variable costs per year**
Seed (20-25 kg/acre) @ 120	3000	29.41	**117.65**
Ploughing and harrowing	9000	88.24	**352.94**
Fertilizer 2bags/acre @ 2700 per bag	5400	52.94	**211.76**
Weeding (3 people*8 days*100)	12000	117.65	**470.59**
Spraying 6 Sprays @ Kshs 250	1500	14.71	**58.82**
Harvesting/sorting and grading (7people/day/acre for 2 weeks)			
(7*14*100)	9800	96.08	**384.31**
Machinery	6,500	63.73	**254.90**
Total	**47200**	**462.75**	**1850.98**
***** Standards- Testing, Inspection & Auditing***			
Auditing	64,000	627.45	627.45
Report fee	10,000	98.04	98.04
Soil Testing and Analysis	12400	121.57	121.57
Total	**86,400**	**847.06**	**847.06**
Total Variable Costs	**133,600**	**1309.80**	**2698.04**
Total costs			**3678.43**
Output			
2000 kgs per acre @ 30 per kg for 4 seasons	**240,000**	**2352.94**	**9411.764706**
Gross Margins (Revenue-Total costs)			**5733.33**
*** equipment include investment costs for physical infrastructure and protective gear**			
**** these are costs of renewing certification annually**			

Source: Author 2015

Appendix 5.2: Production costs per acre (4046.86m^2) per year for a farmer under group certification

Production Costs	Kshs	*Euros***	Totals/year (4 seasons)
Fixed Costs			
Equipment*	32,000	313.73	
Total		**117.65**	
Variable Costs (Per season)			**Variable costs per year**
Seed (20-25 kg/acre) @ 78	1950	19.12	**76.47**
Ploughing and harrowing	3000	29.41	**117.65**
Fertilizer 2bags/acre @ 2700 per bag	5400	52.94	**211.76**
Weeding (3 people*8 days*100)	2400	23.53	**94.12**
Spraying 6 Sprays @ Kshs 60	1500	14.71	**58.82**
Harvesting/sorting and grading (7people/day/acre for 2 weeks)			
(7*14*100)	9800	96.08	**384.31**
Machinery	700	6.86	**27.45**
Total	**24750**	**242.65**	**970.59**
***** Standards- Testing, Inspection & Auditing***			
Auditing	4,000	39.22	39.22
Report fee	2,000	19.61	19.61
Soil Testing and Analysis	2000	19.61	19.61
Total	**8,000**	**78.43**	**78.44**
Total Variable Costs			**1049.03**
Total costs			**1166.68**
Output			
2000 kgs @ 26 per kg for 4 seasons	**208,000**	**2039.22**	**8156.862745**
*** equipment include investment costs for physical infrastructure and protective gear**			
**** these are costs of renewing certification annually**			

Source: Author 2015

Appendix 5.3: Cost and Margins for a Briefcase Exporter

	Kshs	Euros*	*Beans Weighted***	Totals/ year
Fixed Costs				
Initial investments	***5,000,000***	49019.61	49019.61	
Licensing (Nairobi City Council)	64,000	627.45	627.45	
Licensing (HCDA)	5000	49.02	49.02	***49696.078***
Variable costs				
Purchase of produce from farmers				
Beans (506 tonnes @ Kshs 30/kg)	15180000	148823.53	148823.53	
Snap Peas (156 tonnes @ Kshs 80/kg)	12480000	122352.94	122352.94	
Renting a pack house ***(quarterly @ 87,500)***	350,000	3431.37	2621.57	
Transport to pack house	500,000	4901.96	3745.10	
Electricity	890,000	8725.49	6666.27	
Water	340,000	3333.33	2546.67	
Labour (20 permanent)	1,300,000	12745.10	9737.25	
Labour (200 casual)	5,400,000	52941.18	40447.06	
Telephone and internet	150,000	1470.59	1123.53	
Packaging &labelling	490,000	4803.92	3670.20	
Monitoring farmers (10 field workers)	1,500,000	14705.88	11235.29	
Storage costs	630,000	6176.47	4718.82	
Air freight (US$ 1.2/kg)	63552000	623058.00	476016.31	
Taxes (HCDA CESS)	200,000	1960.78	1498.04	
Taxes (KEPHIS CESS	210,000	2058.82	1572.94	
Marketing/advertising/promotion	60,000	588.24	449.41	
Total	**103,232,000**	**1012077.61**	**837224.94**	***1012077.61***
Annual Costs of Meeting standards				

Phytosanitary certificate	112,000	1098.04	839.34	
Total Costs Standardization	**1,092,000**	**10705.88**	8183.58	***10705.88***
Total variable costs/year		***1022783.49***	***845408.52***	**1022783.49**
Total costs		***1072479.57***	***895104.59***	**1072479.57**
Output***				
Beans x-fine (200 tonnes @Kshs 380/kg)	76000000	745098.04		
Beans fine(226 tonnes @ Kshs 215/kg)	48590000	476372.55		
Snap Peas (139 tonnes @ Kshs 364/kg)	50,596,000	496039.22		
	175,186,000	***1717509.80***		***1717509.8***
* The euro to the shilling exchange rate was 102 at the time of the survey in 2009				
** the values for green beans are calculated separately based on their volumes				
*** Some of the beans are rejected and sold in the local market hence the output for export market is lower				

Source: Author 2015

Appendix 5.4: Costs and Margins- Large Scale Integrated Exporter

	Kshs	*Euros***	*Beans weighted*	Totals/year
Fixed Costs				
Initial investments	***100,000,000***	980392.16		
Licensing (Naivasha and Nairobi city councils)	128,000	1254.90		
Licensing (HCDA)	5000	49.02		
Total	100,133,000	981696.08		981696.08
Variable costs				
Purchase of produce from farmers				
Beans (2200 tonnes @ Kshs 30/kg)	66000000	647058.82	2215954.88	
Snap Peas (1800 tonnes @ Kshs 25/kg)	45000000	441176.47		
Mangetout (1630 tonnes @ 20/kg)	12600000	123529.41		
Baby corn(890 tonnes@ 20/kg)	7800000	76470.59		
Sugar snaps (760 tonnes@ 26/kg)	5200000	50980.39		
Others (500 tonnes @20/kg)	11,200,000	109803.92		
Own production (10000 tonne)	205552000	2015215.69	588442.98	
Transport to packhouse	2,000,000	19607.84	5725.49	
Electricity	840,000	8235.29	2404.71	
Water	1,732,000	16980.39	4958.27	
Labor (600 permanent)	127,000,000	1245098.04	363568.63	
Labour (4500 casual)	238,000,000	2333333.33	681333.33	
Telephone and internet	1,800,000	17647.06	5152.94	
Packaging &labelling	120,000,000	1176470.59	343529.41	
Monitoring farmers (80 field workers)	28,800,000	282352.94	82447.06	
Storage costs	17,900,000	175490.20	51243.14	
Air freight (US$ 1.2/kg)	1116960000	10950588.24	3197571.76	
Taxes (HCDA CESS)	150,000,000	1470588.24	429411.76	
Taxes (KEPHIS CESS	68,000,000	666666.67	194666.67	
Marketing/advertising/promotion	22,000,000	215686.27	62980.39	
Total	**2,248,384,000**	**22042980.39**	6436550.27	**23106196.08**

Annual Costs of Meeting standards				
Certification and Accreditation	1,480,000	14509.80	4236.86	
Inspecting and testing (third party)	1,500,000	14705.88	4294.12	
Phytosanitary certificate	112,000	1098.04	320.63	
Total Costs Standardization	**3,092,000**	**30313.73**	8851.61	**30313.73**
Total variable costs/year	**2,251,476,000**	***22073294.12***	***6445401.88***	**23136509.80**
Total costs	**2,351,609,000**	***22073294.12***	***7427097.96***	**23136509.80**
Output				
Beans (5200 tonnes @ Kshs 215/kg)	1118000000	10960784.31		
Snap Peas (4800 tonnes @ Kshs 364/kg)	1747200000	17129411.76		
Mangtout (1630 tonnes @ 212/kg)	345560000	3387843.14		
Baby corn(890 tonnes@ 189/kg)	168210000	1649117.65		
Sugar snaps (760 tonnes@ 243/kg)	184680000	1810588.24		
Others (500 tonnes @220/kg)	110,000,000	1078431.37		
	3,673,650,000	***36016176.47***		

Source: Author 2015

Appendix 6.1: List of Producer Organizations and their characteristics

Group Name & Location	Year of Establishment	Membership	Group Contract	Valid Group certification
1. Badilika Farmers Association Taveta	2007	40	Yes	Yes
2. Enkague Farmers Association	1999	34	Yes	Yes
3. Kamwembeni Self Help Group	2004	38	Yes	No
4. Karia Self Help Group	2002	26	No	No
5. Kinyuni Growers Association	2005	49	No	No
6. Matunda Self Help Group	2003	27	No	No
7. Kikala Mango Growers	2004	30	No	No
8. Kikoo Small Scale Farmers Association	2006	34	No	Yes
9. Kimbimbi Haraka Farmers Association	2006	54	Yes	Yes
10. Kilungu Self Help group	1998	52	No	No
12. Kwakyai Rural Sacco	2004	224	Yes	Yes
12. Lari Swamp Self Help Group	2008	32	No	No
13. Kinyuni Growers Association	2001	45	No	No
14. Kikoo Small Scale Growers Association	2004	40	No	No
15. Mirangi Horticulture Self Help Group	2002	36	Yes	No
16. Mrabani Fruits and vegetable growers	2004	44	Yes	Yes
17. Mutige Horticultural project	2001	53	Yes	No
18. Ragati Avocado Group	2005	43	Yes	Yes
19. Rare Self Help Group	2008	18	No	No

Source: Author 2015

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Gloria A. Otieno

Gloria Otieno is an Agricultural Economist with a strong bias to Agricultural Development. Ms. Otieno Graduated from Jomo Kenyatta University of Agriculture and Technology with a Bsc. Degree in Food Science and Nutrition in 2001. Ms. Otieno also pursued a Post graduate Diploma in Nutrition planning and development at Ghent University in Belgium in 2003 and MSc. degree in Agricultural Economics and Rural Development from Ghent University -Belgium in 2004.

Ms. Otieno's previous work experience has been in the area of Agricultural policy, food security and trade with Kenya Institute for Public Policy Research and Analysis (KIPPRA) where she worked as a policy analyst between 2005 and 2006, Kenya Anti-corruption commission as a Research officer between 2006 and 2007 and the Consumer Unity Trust Society (CUTS) Africa resource Centre as a Consultant on Agricultural trade, food security and policy issues between 2010 to 2012. Ms Otieno has an experience spanning over 13 countries in East, West and Southern Africa.

Ms. Otieno is currently working as an Associate Expert Genetic Resources, Climate Change and Food security policy at Bioversity International based in Uganda sub-regional office in Kampala.

Contact Information:

Office:

Gloria A. Otieno

Bioversity International – Uganda Sub-regional office

Plot 106 Katalima Road,

Naguru – Kampala

P.O Box 24384

Kampala

Uganda

Email: g.otieno@cgiar.org

Personal Contact:
Gloria A. Otieno
P.O Box, 7356-00100
Nairobi-Kenya
Tel: +254706673742
Email; glory_atieno@yahoo.com

This Thesis has not been submitted to any other University for a degree or award.