An analysis of supply side constraints on Ethiopian red pepper and paprika capsicum production and export:

a global value chain approach

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PREFACE AND ACKNOWLEDGEMENT

The master *International Development Studies* (IDS) at Utrecht University in the Netherlands has given me extensive preparation to do research in a developing country. I have been educated to apply and test development theories in practise, I have been trained in research methods, and my awareness has been raised to the many ethical and practical pitfalls that research abroad potentially entails.

During the second semester, IDS students travel all over the world to scrutinize theoretical concepts and test them against reality. The students' empirical findings will overlap, be complementary or sometimes even contradict grounded theoretical frameworks. Whatever happens, doing research abroad, while carrying full responsibility, is a life changing experience for every student, and has given me in particular much more experience in scientific knowledge generation than hundreds of textbooks could have done.

I have been to Ethiopia for four-months where I have had a wonderful time, while pushing myself to the limits of my abilities. I am most grateful to my host organisation, the Ethiopian Economics Association (EEA), located in the capital Addis Ababa, where I stayed for four months. I would like to express my special thanks to all the people within the EEA, who have assisted me in fulfilling this research and I want to say that without them this thesis would not have been what it is today.

Special appreciation goes to the CEO, Dr. Assefa who was so kind to provide me with an office space. My direct supervisor, Amin Abdella who took me along to several conferences, and helped me to discover and understand the Ethiopian economy, society and culture much better. In addition, I would like to thank Amin for pushing me to get the most out of my research, something which I am very grateful for. My direct colleague, Dawitt, has been a great friend. Thanks to him for all the discussions we had about the research and everything else that living abroad brings. Last but not least, I would like to thank all other colleagues at the EEA, who assisted me in countless ways. I also want to express my gratitude to the team of intelligent and meticulous enumerators, Tadeowos, Abraham, Eyob and Endashaw without whom I could not have done this research.

At Utrecht University (UU) special thanks goes out to my direct supervisor, Guus van Westen, who advised me at critical points in the research. His confidence and interest in the research topic from the start was a great motivator. Furthermore, I want to thank the entire staff at the faculty of international development studies for sharing with me their thoughts and insights in the field of international development.

The EEA, the UU, and not to forget my girlfriend, Laura - who had to cope with all thesis writing issues - have made this final thesis possible. I hope you all will enjoy reading this master thesis.

Utrecht, 1 October 2010
Thijs Rutgers

EXECUTIVE SUMMARY

One of the structural development problems of Ethiopia is the increasing trade deficit. There are several underlying causes. First, the Ethiopian economy relies primarily on agriculture: the sector attributes 45% to GDP and contributes for 80% to foreign exchange generation, of which coffee is the main contributor. The high dependence on the agricultural sector, which is comprised of just a hand-full cash-generating crops, is a huge risk for sustainable exports. Secondly, the international competitive position is jeopardized by poor infrastructure, low worker productivity and poor export regulations.

To counteract these supply side constraints, the Ethiopian government pursues an agenda of agricultural market liberalisation. The aim is to increase agricultural production, through the extension of economic incentives for farmers, and the participation of the private sector in economic activities. In addition, the government composed a strategy paper (PAS-DEP), which states that the agricultural sector needs to be diversified by making more segments of the sector, amongst which spices, suitable for exports.

This study is contributing to these objectives by investigating the supply side constraints for two spices, red pepper and paprika capsicum, with a high potential for exports.

In the first stage of this study, it became clear that the market for red pepper and paprika capsicum is characterised by insufficient output, low quality and a fluctuating supply. These findings led to the following central research question:

"Which supply side constraints are impeding a continuous supply of high quality red pepper and paprika for exports?"

The *global value chain* (GVC) approach is chosen as a means to answer the central question, since it offers the ability to cut through all kind of economic realities and specify constraints surrounding a specific product. The GVC approach combines two important analytical tools. First of all, it applies a business management approach by identifying constraints of individual firms (stakeholders). Secondly, GVC uses power analysis to identify different types of governance between firms. Combining elements of constraints and governance types provides an analytical lens, through which actors can be identified, that have the willingness and ability to lead upgrading strategies.

The methodology applied in this study combines quantitative and qualitative techniques, also known as a q-squared method. The focus of this research is on the Southern Region of Ethiopia, and more specifically on Gurage and Silte zones. The selection of these zones is based upon their high potential and high quality of red pepper production.

The fieldwork conducted for this study encompassed four phases. In the first phase, scoping interviews were held in Addis Ababa with main stakeholders. The second phase consisted of scoping interviews and simultaneous construction of the sample frame in the Gurage and Silte zones. In the third phase, 273 questionnaires were conducted among farmers. Finally, in the last phase, in-depth interviews were held in Addis Ababa, and markets were visited in the capital as well as in the region. In addition, several focus group discussions with farmers took place.

The research is captured by the following hypothesis:

"It is anticipated that small-scale farmers, who are mainly producing for the domestic market are positioned in a market governance structure, and farmers who are producing for the international market are part of a vertically integrated structure. In the vertically integrated

structure upgrading is more likely to be driven by an internal stakeholder, while the market governance structure needs facilitation from an external stakeholder. The farmers producing red pepper and paprika can be divided into successful and unsuccessful farmers of which the first derive more benefits from upgrading."

The research findings suggest that the hypothesis is proven. The findings indicate that the domestic chain does not have a central leading firm which lays down standards about quality, quantity and delivery times. Visibly, there are informal relations between actors (buyers and sellers), based on repetitive transactions. However, these interactions are not strong enough to institutionalise best practises for the chain as a whole.

There are several explanations found for the conclusion that endogenous improvements within the domestic chain are unlikely. First, without a formal governance structure, most stakeholders interact foremost at the local market, which is characterized by failures. Most farmers lack access to information (price, weight of product, etcetera) which makes them easy victims of scams and tricks. Traders are often scammed by farmers through adulteration of the product. Thus, the lack of a proper functioning market results in farmers and traders who do not trust each other. Farmers anticipate upon scams by adulterating the product and traders anticipate upon adulteration by scams. Due to this, cooperation between stakeholders is improbable.

Secondly, for chain improvements to be effective, farmers need to cooperate. Results show that only few farmers actually cooperate when selling their product. This is a striking result since most farmers cooperate extensively during the production process. This cooperation is locally known as *Geza.* The marketing of the product appears to differ from the production process to such an extent, that farmers are not willing to cooperate on this part of the business cycle. Apparently, in this case, social capital is context specific.

Thirdly, the fact that most farmers are hampered by external factors, such as rainfall and lack of capital, makes them powerless in changing the situation. Local traders lack sufficient working capital to invest in chain upgrading, and wholesalers from Addis Ababa actually benefit from irregularity and price fluctuation. All this suggests that change from within the supply chain is unlikely. This has an effect on the viability of export chains. Thus, the fact that the domestic chain does not have a formal type of governance, lacks trust, lacks ability and willingness to improve, makes endogenous driven growth for the domestic chain unlikely, hence, public-private initiatives are needed.

While export chains partially use raw material provided by the domestic chain, they also have created their own sub-value chains (export chains) in order to supply them with pepper. As predicted by the hypothesis, these export chains do indeed display much stronger relations between stakeholders: information and inputs are distributed between stakeholders and premiums are given by lead firms. Although these export chains are not fully vertically integrated, they do deviate significantly from the domestic chain in terms of cooperation. Because of this extensive cooperation, it is expected that internal stakeholders can be the drivers of upgrading, as opposed to the stakeholders in the domestic chain.

This study has developed an upgrading framework to analyse potential interventions in terms of efficiency and equity improvements. In short, the framework asks to whom the outcome of the intervention accrues, and what the effects will be in terms of efficiency and equity. In the final part of the framework, a discussion is presented regarding the question why it is justified that some actors will lose and others will gain by the different interventions. The research presents four upgrading strategies for the domestic chain: adjusting market failures, investments in small-scale farmers, leapfrogging of trader, and assist farmer cooperatives to work on red pepper. One separate strategy is designed for export firms: downstream actors start insourcing.

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Glossary: abbreviations

ACP	: African, Caribbean and Pacific Group of States
ADLI	: Agricultural Development Led Industrialisation
ASTA	: American Spice Trade Association
CCI	: Crop commercialisation index
CEO	: Chief executive officer
COMESA	: Common Market for Eastern and Southern Africa
CSA	: Central Statistical Agency
ECA	: Ethiopian Customs Authority
EEA	: Ethiopian Economics Association
EPRDF	: Ethiopian People's Revolutionary Democratic Front
ESEF	: Ethiopian Spice Extraction Factory
EU	: European Union
EU EOM	: European Union Election Observation Mission
GCC	: Global commodity chain
GDP	: Gross domestic product
GVC	: Global value chain
HCI	: Household commercialisation index
HDI	: Human development index
HRW	: Human Rights Watch
ICE	: Integration cash economy
ICI	: Input commercialisation index
ICU	: International colour unit
IOM	: International Organisation Migration
ISI	: Import Substitution Industrialisation
ITC	: International Trade Centre
M.A.S.L	: Meters above sea level
NIE	: New institutional economics
MOFED	: Ministry of Finance and Economic Development
NGO	: Non- governmental organisation
PASDEP	: Plan For Accelerated and Sustainable Development to End Poverty
PRSP	: Poverty Reduction Strategy Program
S.N.N.P	: Southern Nations Nationalities and Peoples
SPSS	: Statistical Program for Social Scientists
WTO	: World Trade Organisation

1 Quintal	: 100 kilo
1 Us Dollar	: 13.5 Birr
1 Euro	: 18 Birr

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1. INTRODUCTION

1.1 Background

While some see inclusion of developing countries' national economy into the global economy as the path out of poverty (see for example Collier, 2007; Wolf, 2004), others are more pessimistic and perceive this as a path to sustained poverty (Escobar, 2004). A third group of scholars seem to take a more pragmatic approach and consider each case by its unique merits and constraints (see for example Kaplinsky, 2000).

Many donors, NGO's, multinational organisations and national governments seem to align themselves with the pragmatic approach and question if export growth in a particular sector is worth pursuing. Some might focus on efficiency gains (growth of exports), while others might be more concerned with poverty alleviation goals. Most seem to acknowledge that building a strong and vibrant agricultural sector, although not the panacea, could at least be an important step in the process of economic and social growth.

One of the structural development problems of Ethiopia is the increasing trade deficit. This is mainly due to poor performance of the export sector (Degu et al., 2010). The European Union (EU) requested several major research institutes in Ethiopia to study the supply-side constraints that impede Ethiopian firms from exporting their products. The research institute, The Ethiopian Economics Association (EEA) accepted one of the EU projects and scrutinized supply side constraints regarding five major agricultural export products: coffee, leather, pulses, flowers and oilseeds.

This study, '*An analysis of supply side constraints on Ethiopia's red pepper and paprika capsicum production and export: a global value chain approach*' is brought under the umbrella of the project: '*Supply side constraints to Ethiopian exports*' from the Ethiopian Economics Association. While the EEA focused on the five major export crops, this research pays attention to the spice sector which as a whole has received little attention in academic literature. The neglect of scholars might be explained by the primary focus on the major export crops and the relative economic insignificance of the spice sector.

However, this neglect is likely to change in the near future. The Ethiopian government is pursuing a strategic policy which aims to diversify the export base away from coffee to other crops, and international donors are interested in investing in the spice sector because of the high export potential of many spices (ITC, website). The aim of this research is to explore constraints for two purposively selected spices, red pepper and capsicum paprika[1], with the intent of contributing to knowledge generation and to make a contribution to the improvement of the lives of hundreds of thousands small-scale farmers for whom spices are the main source of income.

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[1] In Europe it is custom to use the term paprika for sweet bell paprika's. The term paprika in this research refers to a paprika variety related to red pepper. It is characterized by low pungency but high colour unit. The red pepper of concern in this study is known in Ethiopia as the major ingredient to Berbere (a spice mixture).

1.2 Problem statement

This section starts by discussing some general features related to agricultural production and trade in Ethiopia. It continues by focusing on specific constraints related to the two products, red pepper and paprika.

Ethiopia's annual population growth outpaces its growth in agricultural production (EEA, 2010; Mengistu et al., 2009) resulting in food shortages in many regions of Ethiopia. Agricultural growth is not only necessary to feed the population, but is also the driving force behind foreign exchange generation. 80% of Ethiopia's foreign exchange is derived from agricultural exports, of which coffee is the main contributor (EEA, 2007/08). Stagnating agricultural development is a major concern to the livelihoods of the majority of the people, especially considering that the income of 85% of the population is primarily dependent on it (Mengistu et al., 2009).

The internal infrastructure which is supposed to facilitate trade is hampered by dirt roads, insufficient electricity, a weak institutional setting, low educational status, and low worker productivity (EEA, 2010). A major impediment directly affecting a sustainable agriculture is that most of the production takes place at the mercy of nature. Good or bad performance is related with good or bad weather conditions. Despite the vulnerability of the sector to the vagaries of nature, there has been insufficient work to build coping mechanisms, such as water management structures for Ethiopian farmers (Ohno, 2009).

The spice sector can be characterised as underdeveloped, unorganized, small-scale, and inefficient. Furthermore, it depends highly upon output delivered by small-scale farmers (Anonymous).

In 2003, the Ethiopian Export Promotion Agency studied red pepper trade and found the following constraints: a lack of improved seeds to satisfy farmers demand, lack of advice and technical assistance to farmers, non-timely distribution of fertilizer, which leads to delay in sowing and harvesting periods, traditional way of cultivating, lack of training for experts and shortage of manuals, publications and guidelines for spice production (Roukens, 2005).

Mussema (2006) studied the red pepper domestic agricultural marketing chain from an economic perspective. Her results show that the pepper chain is highly oligopolistic[2] with just a few large trading companies handling around 90% of the product. Furthermore, Mussema found differences in price setting mechanisms at local markets, presence of plant diseases, and inadequate market (price) information for farmers. She concluded that although the production of pepper is constrained by variable seasonal conditions, in general domestic demand is saturated. This is because pepper producing areas are scattered throughout the vast land of Ethiopia, and if one region fails in production another is likely to be more fortunate. Hence the red pepper chain is constrained by a poor agricultural marketing system, plant diseases, and an unstable price of pepper, all of which discourage farmers from producing more (Mussema, 2006).

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[2] an oligopoly is a market form in which a market or industry is dominated by a small number of sellers (oligopolists).

The main exportable product derived from raw red pepper and paprika capsicum is paprika oleoresin. By an extraction process, adding solvents to red pepper or paprika, oleoresin is gained.

Prior to 2005, the production and export levels of paprika oleoresin were high, with a peak in 2001/02 and 2002/03 with 60 and 67.3 tons, respectively. From 2005 onwards the Ethiopian Spice Extraction Factory has not produced paprika oleoresin for exports.

TABLE 1.1
Ethiopian exports of oleoresins, USD (x1,000)/tons

	PAPRIKA		CAPSICUM	
	US$	Volume	US$	Volume
2000/01	609.302	20.5	0	0
2001/02	1494.042	**60**	9.112	1.65
2002/03	1859.36	**67.3**	12.67	2.6
2003/04	1333.346	48.6	11.628	2.2

Source: adapted from Roukens (2005).

Another although less significant exportable pepper product is the powdered, crushed or ground red pepper. Export data (2001-2008) from the Ethiopian customs authority, on product group 09042000 (Fruits of genus capsicum or pimenta, dried, crushed or ground) is listed in the table below. It is important to note here that this product group includes all types of pepper from the capsicum plant, i.e. it is impossible to attribute these figures entirely to the red pepper of concern in this study. No lower level data is available.

TABLE 1.2
Ethiopian exports of 09042000 specified by country of destination in kilogram

	2001	2002	2003	2004	2005	2006	2007	2008
Australia	2		50					
Canada	200			300	110	200	440	2.470
Djibouti	1246	276	1731				59	
Germany		130					10.144	10.394
Great Britain		50		50				
Greece		25	55					
Israel			100			15	700	3000
Saudi Arabia		2000		3000				
Sweden			50		105	49		
Switzerland	20							
Ukraine					2205			
USA	1620	2765	48	3638	952	6079,5		7.120
TOTAL	3088	5246	2034	6988	3372	6343.5	11.343	22.984

Source: Ethiopian customs authority (2001-2008)[1]

Table 1.2 shows that there is a huge irregularity in exports from year to year. Total red pepper volume exported ranges between 3088 kilogram in 2001 and 22.984 kilo in 2008. "Why is the ground pepper export so irregular?". A quick market appraisal by retailers, exporters and the Ethiopian Spice Extraction Factory (ESEF) indicates that the quality available

is insufficient, supply of red pepper and paprika is low, and related to the last problem, supply of red pepper fluctuates during the year, and between years. Due to these constraints, exports of paprika and capsicum oleoresin by ESEF has plummeted to zero, and ground pepper exports show enormous fluctuations. Instead of taking low quality and quantity and irregularity of supply as conclusions, this study adopts these findings as point of departure. This leads to the following central question:

> **"Which supply side constraints are impeding a continuous supply of high quality red pepper and paprika for export?**

1.3 Relevance of study

As became clear from the problem statement, the red pepper supply chain suffers from low production, low quality and irregularity of supply. Furthermore, in the last five years the ESEF has been confronted with such low supply of red pepper that exporting paprika oleoresin became an unprofitable business. In addition, red pepper exporters are wary of further engagement in pepper exports. These problems of low quality and quantity not only influence the international competitiveness of Ethiopian exporters and factories, but also make it harder and harder for small-scale farmers to continue producing this crop.

In short, the aim of this research is to provide an answer to the current problems in the red pepper supply chain. The research is structured around three themes. The first issue which will be addressed is: who are the main stakeholders and which constraints do they face in dealing with red pepper? Secondly, it is thought that a profound understanding of the three problems can be derived from analysing chain configuration and its accompanying governance structure, and finally this research aims to articulate upgrading strategies that could help to improve the chain's performance and simultaneously improve the situation of its various actors.

This research contributes by exposing constraints to exports, and by generating new knowledge on red pepper and paprika production and trade. Furthermore, this research contributes in the following ways:

1) It is noticed that a clear agricultural supplier typology within value chain analysis is absent. Although a rather simple dichotomy between small and large scale farmers in literature exists, this is seen as insufficient when discussing upgrading strategies. This research groups farmers based upon their ability to produce more than average in three consecutive years, by means of multiple regression analysis (see chapter 6: small-scale farmers in pepper).

2) Upgrading strategies form an interesting part of value chain research. Based upon chain configuration, constraints, and governance structure upgrading strategies can be composed. There are three distinct positions within upgrading literature. First, those that talk about upgrading from a technical standpoint, secondly those that seek for efficiency improvements and finally those that are mostly concerned about equity. To inform, and improve the discussion on upgrading strategies, this research constructed an overarching framework that allows discussion of the different approaches from a

holistic point of view by including technical, efficiency and equality in one framework (see chapter 7: upgrading framework).

The findings of this research can be used to inform policy debates at national and regional level that seek to extend the productivity of the spice sector. Furthermore, stakeholders, such as NGOs, the private sector, donor community, industrial organisations, and others can use the findings in their activities within the spice sector. More specifically, this research aims to inform:

➢ Policy makers (specifically the Ethiopian government and the International Trade Centre) who are about to start a project to develop the spice sector.
➢ The private sector who can use the findings to explore business opportunities.
➢ The Ethiopian Spice Extraction Factory and exporters who might use the findings to change the current problems into opportunities.
➢ Donors, NGOs, and governments who are working on upgrading strategies.
➢ Scholars who are working on improving value chain analysis, and in particular the concepts of supplier typology and upgrading
➢ The Ethiopian Economics Association who can apply the findings to their project "supply-side constraints of Ethiopian exports".

1.4 Justification of study

This section aims to justify the chosen subject, red pepper and paprika for exports. The approach used to analyse both products, global value chains, is discussed in the next section 1.5 (approach and limitations). Two questions are relevant here. Why is it relevant and worthwhile to study agricultural products destined for exports, and why is the scope of the research limited to Ethiopia instead of taking a global perspective?

There remains a highly controversial debate if trade and specialisation in agricultural production is beneficial for developing countries. Die-hard proponents argue that in the case where a country's income will rise, even though if some individual groups may lose, it is still a path worth pursuing (Krueger, 1988 in Berry, 2001). Moderate proponents of agricultural trade point to the fact that agricultural exports help to generate the much needed foreign exchange (Cypher, 2009) and some scholars argue that stimulating agricultural trade is one of the best ways to reduce rural poverty, through the creation of productive employment in rural areas (Berry, 2001).

One of the most important theories given by opponents of agricultural exports was formulated in the 1950s. Paul Prebish and Hans Singer postulated the terms of trade argument (also known as Prebish-Singer hypothesis) which states that if countries continue to specialise in highly competitive agricultural markets, than they will be increasingly subject to the erosion of their returns due to falling terms of trade (Kaplinksy, 2000). In other words, countries that rely on an extensive agricultural sector notice that they need to export more and more agricultural products over the years to maintain the same amount of imported industrial products. Besides this general theory, concerns have been expressed towards the idea that expansion of the arable land to export crops can have distribution-worsening effects, in case agricultural development coincides with the introduction of labour-saving technology. Secondly, producing crops for export tends to profoundly affect land tenure and social relations. And finally, some are concerned that the expansion of commercial crops diminishes the output of staple food and can as a result raise local food prices (Berry, 2001). In his final conclusion Berry's (2001) statement is rather pessimistic: "For the present, it appears unlikely that agri-

cultural exports will be a major source of poverty reduction for the rural poor in the Third World taken as a whole".

The diverse pros and cons mentioned above make it hard, maybe impossible, to give an all-encompassing justification to this study. However, while acknowledging that exporting agricultural products does not always lead to growth or to improvements in the livelihoods of small-scale farmers, it is believed that if a country makes sure that the institutional setting is 'right' exporting agricultural products do have the potential to jumpstart economic growth, while simultaneously including small-scale farmers and improving their livelihoods.

Secondly, it is chosen to narrow down the focus of the research to the nation-state of Ethiopia. Although export items are by nature crossing boundaries, it is believed that to understand the current chain problems of low supply, quality and irregularity a focus on constraints of stakeholders *within* Ethiopia should be given priority. This decision is supported by findings from the rapid market appraisal that demand at the world market is not a primary constraint (demand is growing every year), and most of the problems arise due to supply side constraints. The field of study is made dark blue in figure 1.

FIGURE 1.1
A value chain
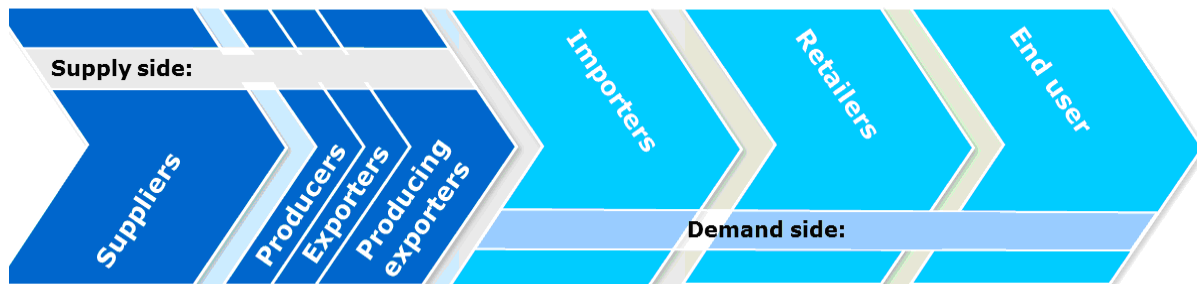
Source: adapted from CBI

Hence, it is thought that before analysing the two spice crops from a global perspective, the Ethiopian 'strand' of the chain should be thoroughly scrutinized. This research aims to fill that gap.

1.5 Approach and limitations

In a fast moving economic environment, it is necessary to have tools to evaluate potential outcomes of changes, and to capture complex surroundings in a simplified model. Faße (2009) states that: *"value chain modelling is a meaningful instrument to analyze questions which flow through multiple economies"* (Faße et al., 2009). Furthermore applying a value chain approach is particularly useful if multiple goals, such as export promotion and poverty reduction need to be addressed (Kaplinksy, 2000).

More specifically, the *global value chain* (GVC) approach is chosen for its ability to cut through all kind of economic realities and specify constraints surrounding a specific product. The GVC approach combines two important analytical tools. First of all it applies a business management approach by identifying constraints of individual firms (stakeholders), and secondly GVC uses power analysis to expose different types of governance within the firm. A combination of an analysis of constraints and governance type provide the right basis to compose upgrading strategies that have the ability to improve the value chain.

There are, however, some limitations to the use of the GVC approach. It lacks a holistic perspective, because it pays less attention to concepts as institutions, social capital, trust,

and embeddedness. *"Although the influence of public regulation and trade policy instruments is acknowledged, it does not recognise that institutions can play a steering role in value chain development and upgrading issues"* (Laven, 2010). Furthermore, global value chain analysis is also limited in providing insight into the heterogeneity in outcomes for different types of producers (Laven, 2010). The first shortcoming, lack of inclusion of institutions in the analysis is corrected by making use of literature on institutions, transactions costs and social capital. The second shortcoming of GVC is addressed by discussing effects of upgrading at different scale levels and with different stakeholder groups.

1.6 A guide to the study

This study continues in the next chapter by sketching the institutional setting of the value chain of red pepper. In the same chapter, the difference between red pepper and paprika is explained and attention is paid to the locations where the products can be found. Chapter 3, explores the literature on global value chains, and discuss additional theoretical concepts (institutions, transaction costs and social capital) that are needed to form a deeper understanding of the chain. Chapter four discuss the research methods employed, explains the main hypothesis and provides a conceptual model in which the research is visually represented.

The first chapter of the results section, chapter 5, provides an overview of all relevant stakeholders and discuss constraints faced by individual stakeholders. Based upon these constraints and chain configuration, the governance structure of the Ethiopian red pepper and paprika chain is given. A good understanding of the position of farmers within the chain is necessary, which brings the need for a special chapter on farmer constraints in chapter 6: small-scale farmers in pepper. The same chapter presents the results of the multiple regression model which shows farmer characteristics that determine success. Chapter 7 (Upgrading framework) introduce a holistic model to analyse upgrading strategies in terms of technical, efficiency and equity goals at multiple scale levels and for different groups. After explaining the functioning of the framework, upgrading strategies derived from the research are presented. Finally, a conclusion/discussion is written in which an answer is given to the central research question, the hypothesis and the applicability of global value chains within an agricultural setting.

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2. REGIONAL FRAMEWORK

The Ethiopian pepper and paprika value chain is dispersed over a vast geographical area, cuts through different ethnic groups, crosses several economic structures, is bounded by cultural phenomena, and deals with an ever changing institutional setting. Understanding the current supply configuration asks us not only to identify the chain itself, but also its surroundings.

2.1 Introduction to Ethiopia

Ethiopia is renowned for its diversity. Some historians consider it to be one of the oldest countries in the world. Others might know it as the country with thirteen months of sunshine, and some like to catchphrase it as the rooftop of Africa. These different titles all are aspects of Ethiopia's diverse culture. There is however another side to Ethiopia that is equally well known, which is its persistent poverty and inequality.

Ethiopia, formerly designated as *The federal republic of Ethiopia*, is located in north-east Africa. It is surrounded by Eritrea, Djibouti, Somalia, Kenya and Sudan. While it shares borders with five different countries, it is cut off from the sea. The Ethiopian landscape varies from lowlands to high plateaus and its climate from very dry to seasonally very wet (Gebre-medhin et al., 2006).

The famous emperor, Haile Selassie, ruled the country of Ethiopia from 1930 to 1974. One of his legacies is still visible today: Addis Ababa, the headquarters of the African Union (Veen, 2004). His successor, Haile Mariam Mengistu, toppled Haile Selassie by a revolution and installed a communist regime, based upon totalitarian principles. He developed a set of institutions and policies to support that system (Asefa, 2003). By installing central control and a policy of Import Substitution Industrialisation (ISI) the Ethiopian economy suffered with devastating results for the people (Degu et al., 2010).

In 1991 Mengistu's political career was ended by a coup d'état. The current prime minister Meles Zenawi transformed the socialist paradigm into a more pragmatic, liberal and open market economy. Under the rule of the Ethiopian People's Revolutionary Democratic Front (EPRDF) the country is following Western principles, such as free markets, and liberalisation of trade. Currently, Ethiopia is involved in a number of trade agreements/negotiations including COMESA, ACP/EU and the WTO (EEA, 2010). The regime pursues an agenda of agricultural market liberalisation with the objective of increasing agricultural production through improved economic incentives for farmers and the participation of the private sector in economic activities (Getnet, 2008). This policy has introduced many changes both in the agricultural input and output markets. These include price and market deregulation, abolition of input subsidies (such as credit for fertilizers), and limitation of government participation in supplying inputs and marketing activities (ibid). Hence the current institutional setting is different from Mengistu's in that it advocates free market principles and promotion of exports.

2.1.1 Ethiopian economy

In 2009, the country of Ethiopia was placed 85th on the World Banks gross domestic product (GDP) ladder with an annual GDP of 28,537 million US dollars. The average GDP per capita[3], is estimated at 317 US dollar in 2008[4].

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[3] Method: purchasing power parity.

Official figures from the EEA show that real GDP growth between 1998/99 and 2007/08 has been on average more than 8 per cent, except for the drought year of 2002/03 (EEA, 2010). The Ethiopian government has worked hard to control its macro-economic environment. However, there are still problems with the balance of payment, the exchange rate stability and inflation. The latter is felt severely by the population in terms of rising prices (ibid).

TABLE 2.1
Key figures of Ethiopia

Population:	79.4 million. Growth rate 2.5% (2009)
Capital:	Addis Ababa, 2.4 inhabitants
Land area:	113 million ha, 27 times the Netherlands
Agricultural land	20% of the land is cultivated as agricultural land
GDP:	28, 5 USD billion (2009)
GDP-growth:	8 % (1998/99 to 2007/08)
Origin GDP:	Agriculture 45%, Industry 11% and services 47%
GDP per head:	317 dollar (2009); the Netherlands 23, 300 (2004)
Literacy:	Male 45%, female 35% (2003)
Inflation:	12% (2005-2006)
Main exports:	Coffee, oilseeds, chat, pulses
Export destinations:	Djibouti (14%), Germany (12%), China (9%), Japan (8%)

Source: adapted from (Wijnands, et al, 2007)

The economy is relying primarily on agriculture. Its industrial and service sectors are poorly developed. Its agricultural sector attributes 45% to GDP and contributes for 80% to foreign exchange generation. Dependence to this extent on the agricultural sector is a huge risk since the sector has only 4.4% of the arable land under irrigation. Hence, what happens in this sector is automatically reflected in the performance of the export sector (EEA, 2010).

A promising trend is that the agricultural sector and outputs are growing, but it continues to fall short of population growth (Mengistu et al., 2009). Despite much efforts to increase productivity through introduction of improved inputs over the past three decades (certainly more intensely in recent years), average output per hectare of farm land has not shown significant increase (EEA/EEPRI, 2002).

The production of almost all Ethiopia's export items, with the exception of sugar and gold, is dominated by small-scale farmers. Numerous reports have stressed time and time again that agriculture is the backbone of the Ethiopian economy not just because it constitutes almost half of the GDP but also because more than 85 per cent of the population still depend on it for their livelihood (EEA, 2007/08).

According to the World Bank's 'Doing Business report 2010' Ethiopia is ranked 107th in 2010 and 111th in 2009. The report notes that Ethiopia did reform and doing business in Ethiopia is thought to be relatively easy in comparison to its neighbouring countries (WB, 2010).

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[4] http://data.worldbank.org/indicator/NY.GDP.PCAP.CD

The key challenge for Ethiopia is to increase the productivity of smallholder farmers so that they would increasingly benefit from the small plot of land, and generate a sustainable livelihood for themselves and simultaneously contribute to a growing economy.

2.1.2 Ethiopian society

The country of Ethiopia consists of around 70 different ethnicities. Besides Amharic, which is the national language of Ethiopia, most ethnicities have a traditional language. The total population is estimated at 79.4 million people, according to the Ethiopian Central Statistical Authority (CSA, 2009). In addition to that, over three million Ethiopians live abroad. The International Organisation of Migration (IOM) estimates that the Ethiopian diaspora sends around 350 to 400 million US dollars per-annum in remittances to family and friends in Ethiopia.

The population is predominantly located in rural areas, 85%. The other 15% lives in densely populated urban areas (CSA, 2009). Ethiopia is faced by social problems similar to those in other developing countries. Huge investments in education have created improvements, but nonetheless educational levels are still considered poor. Moreover, high unemployment rates make it hard for young people to use their education effectively. Those living in the city are thought to be better off than those residing in the countryside. Rural and poor urban citizens' access to health facilities is poor and to some even unattainable. Most rural houses are poorly constructed and lack proper sanitary conditions (CSA, 2007a). While the official figure for HIV/AIDS is still low (1.4%) concerns are raised about the continuing spread of the disease[5]. All these issues cause Ethiopia to be ranked 171st out of the 180 nations on The Human Development Index[6] (UNDP, 2009). These factors deteriorate the livelihoods of many Ethiopians and in addition impoverish Ethiopia's international competitiveness in terms of labour productivity.

2.1.3 Political environment

The introduction on Ethiopia (2.1) mentioned that Ethiopia had, under the rule of Mengistu, followed principles of a command economy, and nowadays pursues ideas of free markets, privatization and trade liberalisation. In the political realm the adage: "getting the institutions right" is an important element that underlies most policies. The Ethiopian government is working hard to implement the principles of good governance and is decentralising responsibilities to lower levels of government (Garcia, 2008). According to government policy documents, woreda administrations are supposed to be autonomous administrative units. However without clear functions and internal financial sources, one can hardly speak of woreda autonomy (Ayele, 2009)

In 2005, after the results of the election were made public, major incidents occurred all over the country. The elections held in May 2010 passed quietly and were won by a landslide by the ruling party EPRDF. The European Election Observation mission (EU EOM), raised questions about the prelude to the elections. The EU EOM found that the elections fell short of certain international commitments, notably the lack of a level playing field for all parties to distinguish and proliferate themselves[7]. Human Rights Watch (HRW) stated after the election

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[5] http://www.etharc.org/
[6] The Human Development Index (HDI) is a composite statistic used to rank countries by level of "human development" and separate developed (high development), developing (middle development), and underdeveloped (low development) countries. The statistic is composed from data on life expectancy, education and per-capita GDP (as an indicator of standard of living).
[7] http://www.ethiopianreview.com/content/28021

that Ethiopian government and ruling party officials intimidated and unlawfully restricted the media. The report "One hundred Ways of Putting Pressure" accuse the government of using "*near-total control of local and district administrations to undermine opponents' livelihoods through withholding services such as agricultural inputs, micro-credit, and job opportunities*"(HRW, 2010). It is estimated that Ethiopia has around 200.000 – 300.000 internally displaced people (UNDP, 2009).

2.1.4 Land law system

The pre-1975 land law period can be characterized by a great diversity of official property right regimes. In the year, 1975, under the rule of the socialist Mengistu regime, a land reform was initiated. The previous tenant-landlord relations were abolished, with the intention to make the peasantry free from domination (EEA/EEPRI, 2002). Despite economic and political reforms, the core ideas of the '75 proclamation still hold today: public ownership of all rural lands, distribution of private land to the tiller, prohibition of transfer of use rights by sale, exchange, succession, mortgage or lease, except upon death and only to the wife, husband, or minor children of the deceased. Hence farmers are severely restricted in capitalising on their land. The government remains the structure of the previous regime because it fears that opening up the land market would lead to land concentration and increased land insecurity (Asefa, 2003).

According to EEA/EEPRI (2002), there are some major consequences of the existing land tenure system. It results in declining farm size, tenure insecurity, and subsistence farming practises (EEA/EEPRI, 2002). In addition, De Soto (2000) argues that lack of tenure security constraints the incentive to invest in land improvement measures. But the government holds that the current system is the only way to make sure that tenant-landlord relations are a thing of the past (De Soto, 2000; Asefa, 2003).

2.1.5 Ethiopia's strategy papers (PASDEP/ADLI)

The last section of the institutional framework elaborates on two important strategy papers for the agricultural sector. The ministry of Finance and Economic Development (MOFED) initiated in 2006 'A Plan for Accelerated and Sustained Development to End Poverty (2005/06-2009/2010)'. The main objective of this strategy paper is poverty eradication; all proposed strategies and policies within the document are geared towards this end. The PASDEP represents the second phase of the Poverty Reduction Strategy Program (PRSP), which was launched in 2001. It carries forward several strategic directions - related to infrastructure, human development, rural development, food security, and capacity-building, with a specific emphasis on greater commercialisation of agriculture (MoFED, 2006).

Chapter VII (Sectoral Policies, Strategies, and Programs of the PASDEP) states that: "*agriculture plays a significant and decisive role in the social and economic development of the country. However, owing to natural and man-made causes the country has not properly benefited from its abundant natural resources conducive to agricultural development, and consequently failed to register the desired economic development that would enable its people pull out of the quagmires of poverty.*".

The document states that the major impediment to the functioning of the agricultural sector is the low productivity. Most farmers lack a business/market oriented outlook on agriculture. Too many farmers mainly produce agricultural products for self-subsistence. A productive agricultural economy is further compromised by a mismatch between actual land use and best practise; and there is a lack of input supplies and dissemination of technologies. The document continues in its analysis by acknowledging that current climatic changes are disrupting productivity levels even further.

PASDEP aims to realise, in the five year period (2006-2010) a growth in quantity and quality of marketable agricultural products. Furthermore, farmers will be encouraged to focus on agricultural activities where they have the best comparative advantage. To this end, the Government will provide the required support and technology package, which will be adopted and implemented as appropriate to each specific zone to benefit the population through specialization and diversification. The aim applies to a wide variety of crops, of which spices are one category. It is acknowledged that spices are an important export products, with a huge potential to transform farmers from producing merely for subsistence to a more market-oriented mode of production. It suggests that more land needs to be allocated to spice production, and red pepper is mentioned explicitly. A twofold increase in pepper is envisaged from 11, 623 hectare to 23, 082 hectare with a tripling of volume, from 9, 298 tonnes, to 36, 931 tonnes.

The second agricultural strategy paper is the Agricultural Development Led Industrialisation strategy which has been formulated in the early 1990s and has been implemented in stages, with additional effort from the early 2000s. ADLI is considered to be an evolving strategy paper and is updated based on pragmatism and experimentation. There is however an overarching theme that seems to be adhered to regardless, which is captured as follows: "[ADLI is] *a development strategy which aims to achieve initial industrialization through robust agricultural growth and close linkage between the agricultural and industrial sector*".

The analytical foundation of ADLI recognizes that Ethiopia is predominantly an agrarian society, therefore economic development and structural transformation should be initiated through robust agricultural growth. Labour and land are the main – and abundant – factors of production, and are seen as the competitive advantage of Ethiopia. ADLI aims for a simultaneous increases in output and productivity of both agriculture and industry by achieving close input-output interdependence between the two sectors.

The outcome of the strategy thus far is not very promising: "*The productivity in the agricultural sector did not show significant improvement and output remained volatile because of heavy dependency on the amount and timing of rainfall*" (Ohno, 2009).

A paper about ADLI (Ohno, 2009) indicates that the strategy should be more diverse and flexible in providing incentives to different industrial sectors. The prevailing short list of sectors is too narrow according to Rodrik (World Bank), since many potential successful sectors are almost certainly not on the list - spices and red pepper in particular are (ibid).

2.1.6 Summary

85% of the Ethiopian society is living in areas. Farmers are confronted by many social problems which result in low economic productivity. This is reflected in the economic performance of the country as a whole. While the government is advocating a free and open market economy, trade liberalization, and deregulation and privatization of state companies, the question remains if farmers gain from all this. The fact is that farmers are gaining control of farm management and output marketing under the new regime, but they still lack control of the most important asset: their land.

2.2. The products – Red pepper and paprika capsicum

Nowadays red peppers are grown and consumed in most countries around the globe . This has not always been the case. Before 1492, when Christopher Colombus discovered 'The New World', the Capsicum plant was solely reserved to the native population of the vast unex-

plored continent of America. Spanish *conquistadores* who moved inlands were surprised when they found the pepper plant to be under full cultivation. Soon they discovered that this pepper plant could be an excellent substitute for black pepper, which was even then widely used in Europe. Soon pepper was taken by Spanish and Portuguese explorers and the pepper plant travelled a vast distance, and except for Antarctica is now grown on all continents (Noort, n.d.).

A typical Ethiopian market, with its distinctive wide variety of colours and ingredients is an adventure to see. All sorts of ingredients are available at the market, tomatoes, unions, and of course huge quantities of red peppers. The red pepper of concern in this study is the main component of a mixture called *berbere* composed of red pepper and 18 other spices. It is used in some of the most popular dishes in Ethiopian cuisine.

All red peppers (Capsicum annuum L.) are part of the Solanaceae family, of which tomatoes and potatoes are a part as well. Red peppers have a high nutritional value in the form of vitamin A, C, and E (Noort, n.d; Mussema, 2006).

The world demand for paprika oleoresin (an extraction from pepper or paprika capsicum) is estimated at 50.000 and 60.000 metric tons per annum, of which Spain is the biggest importer and

the biggest exporter of the final product (paprika powder and extracted oil). The largest producing countries are India, Mexico, China, Japan and Thailand (Noort, n.d.). Ethiopia's contribution of red pepper supplied to the world market is so far negligible (Roukens, 2005).

2.2.1 Pepper growing, harvesting, processing and marketing stages

The cultivation process of red pepper is a very delicate matter. The soil should not have been used for pepper or any other member of the Solanaceae family in the last three years (Walker, n.d; Motes, n.d). The soil needs to be prepared carefully with fertilizers ((P) Phosphorus, (K) Potassium and (N) Nitrogen) and while under cultivation the land should be cleaned from perennial weeds at least three times (Smith, n.d; Wakler, n.d; Motes, n.d.).

Red pepper seed should be obtained from a trusted source to ensure that it is clean and free from pathogens, such as bacterial leaf spot, that can be spread via seed (Walker, n.d.). The red pepper should be harvested when it is fully red and starts to dry. After harvesting, red pepper is fully dried (preferable down to 11-13% moisture content) and it is recommended to use shade drying for high quality pepper (Roukens, 2005).

In 2003, according to Melkassa, an Ethiopian agricultural research centre, red pepper yields can reach 15-20 quintals[8] per hectare for Mareko Fana and 20-25 qt/ha for Bako Local under modern practises. Under 'peasant management' the yield is around 10 qt/ha (Aklilu, n.d.). However, according to a study done by the Ethiopian Export Promotion Agency in 2003, yield was only around 6 qt/ha under peasant management (Roukens, 2005). Besides problems accruing to peasant management activities, the varieties of peppers are very old; they were released in the early 1980s and most likely this also contributes to the low yield performance (Roukens, 2005).

Red peppers that are to be sold to the factory, Baltinas (retailers) and some of the exporters are tested for pungency and colour unit. Pungency (hotness) is due to the presence of capsaicin, a colourless, odourless alkaloid that is concentrated in the placental tissue and is tested by the Scoville heat Index (Smith, n.d.). The compound responsible for the red colour is carotenoid pigment (Aklilu, n.d.). The colour content is tested by a spectrographic meter of which the result is calculated to ASTA units.

The raw pepper pod ends up in several final products. Ethiopian consumers blend the red pepper with 18 other spices and use this mixture for some of the most famous local cuisine. This spice mixture, known as 'berbere' is distributed to the Ethiopian diaspora by formal channels (retailers) and informally by families taking the product with them when travelling abroad. Secondly, the pepper is ground and sold as a single powder or in crushed form to the international market. Third, and potentially the highest outlet for red pepper exports, is paprika oleoresin. The problem statement (1.2) drew attention to the Ethiopian Spice Extraction Factory which used to export tons of extracted capsicum and paprika oleoresin abroad, however the current supply chain does not allow them to undertake this activity profitably.

2.2.2 Pepper related issues

Rapid market appraisal revealed that pepper production in Ethiopia is under several threats. It is plagued by several plant diseases, bad weather conditions and a deteriorating variety.

Proper water management is for all crops essential, but red pepper is especially vulnerable to an insufficient moisture level. Although peppers are moderately deep-rooted, they are quite sensitive to moisture stress. Stress during bloom can cause substantial reduction in fruit set, while stress during early fruit growth can induce blossom end rot. Soil moisture stress can also minimize foliage cover, and increasing sun burning of fruit (Smith, n.d.). Motes (n.d.) notes that red pepper plants are likely to make a slow recovery after drought injury (Motes, n.d.). On the other hand, excessive water makes the varieties susceptible to fungal and bacterial diseases during, for example, continuous cloudy and rainy conditions. Thus peppers need dry and warm conditions for good performance with optimal irrigation and proper drainage (Aklilu, n.d.).

One of the major problems in Ethiopia concerning red pepper production is the wide variety of soil- and airborne diseases. Early in the season, pepper plants are damaged by cutworms (Motes, n.d.), and when fully matured they are attacked by viruses, Phytopthara, flea beetles, wireworms, leafminers, and many other insects (Smith, n.d; Motes, n.d.). Viruses are the most damaging pepper disease problem: they can devastate entire fields. Soil borne pests of significance include the root knot nematode. Root knot nematode is a problem only in relatively sandy soils where preceding crops were good nematode hosts (Smith, n.d.). Leafs can be easily infected by all types of diseases (Motes, n.d.) There are no effective chemical control measures to sustain or mitigate diseases; control depends primarily on proper irrigation

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[8] 1 quintal equals 100 kilogram. Contrastingly, in the rural area 1 quintal refers to 10 kilograms.

management (Smith, n.d.). On the other hand, irrigation should be applied cautiously since over-irrigation (or excessive rainfall) promotes Phytophthara and other root-rotting organisms (Motes, n.d.)

2.2.3 New variety – Paprika capsicum

The Ethiopian Spice Extraction Factory (ESEF) has a core business in extracting oleoresin from raw spices. They specialised in working on the extraction of paprika, capsicum, turmeric, and ginger oleoresin. Kalsec International from Kalamazoo, Michigan started the factory 16 kilometres south of Addis Ababa, in 1971. The factory has a production capacity of around 38 thousand quintals per year. Before the introduction of the paprika capsicum variety of the Solanaceae family the factory produced mainly oleoresin from dried and grounded pods of the indigenous variety of red pepper (Merekko fana). By using organic solvents, and subsequently treating the crude extract with polar solvent, the pungent component (oleoresin Capsicum, 25%) is separated from the colour component (oleoresin paprika, 75%).

There are several disadvantages of using the indigenous variety of red pepper for oleoresin extraction. First, red pepper contains only 3.5% of oleoresin, which is quite low compared to the international standard (5-12 per cent), secondly, its colour unit has fluctuations and finally the main cash generator is oleoresin paprika.

In order to increase the profitability of the factory, two new varieties were introduced in 2004: Paprika Queen and Paprika King (Roukens, 2005). These varieties have their origin in Central America, where it was originally cultivated by indigenous people (Aklilu, n.d.). Paprika, which is as well a pepper of the Solanaceae family, has a sweet taste (hardly any pungency) and has a high colour unit. It is primarily used as a source of red pigment to give colour and flavouring (Aklilu, n.d.). According to Smith (n.d.) there are many industrial uses for the red pigment that paprika possesses (Smith, n.d.).

In table 2.1 the main characteristics of Paprika Queen and Mareko Fana are listed. As is highlighted, the paprika queen delivers a higher oleoresin yield (8.5) in contrast to Mareko Fana (3.5) and the colour unit is substantially higher with a positive difference of 73,958 ICU (international colour unit) for Paprika Queen.

TABLE 2.2
Main agronomic and quality characteristics of the paprika and pepper variety

	Paprika Queen	Mareko fana
Fruit length (cm)	10.6	9.7
Pod colour	Deep Red	Dark Brown
Days to red ripening	101	115
Yield in q/ha	17	11
Oleoresin yield %	**8.5**	**3.5**
Oleoresin colour unit	**186,249**	**112,291**

Source (Aklilu, n.d.).

Based on pilot studies, Melkassa research centre has distributed paprika queen seeds to commercial and small-scale farmers to be produced at large scale, with the main purpose being to supply the factory and to substitute the sole cultivar mareko fana (Aklilu, n.d.).

In summary, figure 2. displays the main products of the two varieties, red pepper and paprika. As can be seen from the figure, both red pepper and paprika capsicum can be used

for oleoresin production. There are two types of oleoresin, paprika, and capsicum. The most important type is paprika oleoresin of which red pepper contains 75%, and paprika 100%.

FIGURE 2.0
Red pepper and paprika capsicum product tree
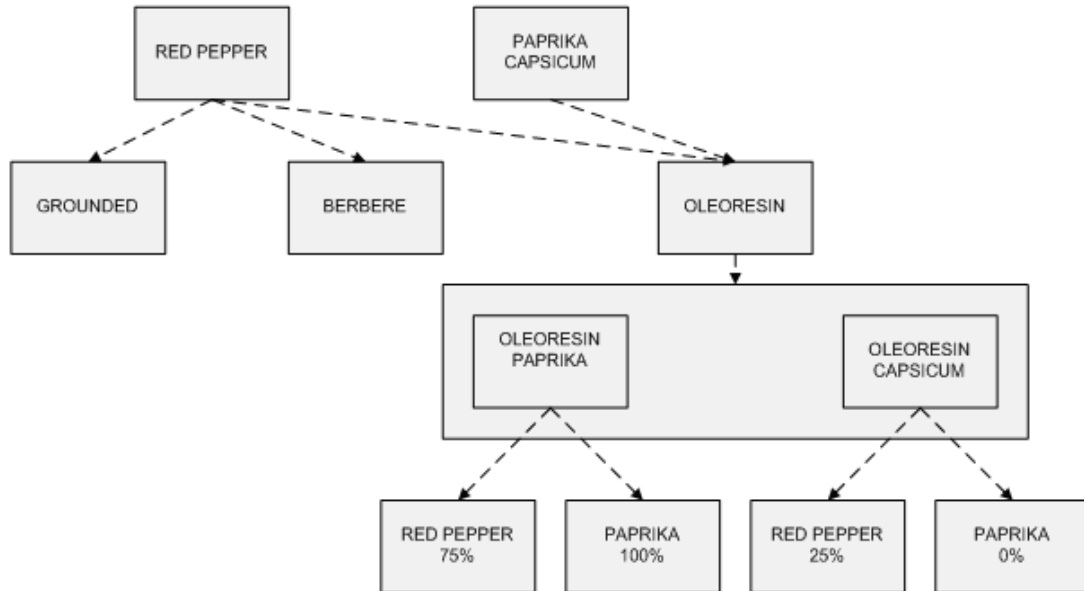
2.3 Research location

Several regions in Ethiopia are successful in pepper production. Amhara Region with 530466 quintals, Oromia Region (581356 quintals) and Southern Nations Nationalities and Peoples (S.N.N.P) Region with 674117 quintals belong to the most potential areas.

While in 2003, most of the red pepper product came from Alaba, Meskanina Mareko and Silte zone (CSA, 2003 as in Roukens, 2005), nowadays most of the pepper comes from Gurage and Silte, both positioned in the S.N.N.P Region (Southern nations nationalities and People's Region) (CSA, 2009).

The focus of this research is on the Southern Region (white in the picture to the right) and more specifically on two lower administrative levels: Gurage and Silte Zone. The research location sites have been selected based upon high potential quantity and quality of red pepper production (for further explanation of site selection, see chapter 4 Research design).

FIGURE 2.1   Regions of Ethiopia

Source: http://m apsof.net/uploads/static-maps/ethiopia_regions_english.png

The research does not cover the entire S.N.N.P Region. Only two zones in the north-eastern part of the Southern Region are part of the research: Silte and Gurage (see figure 2.2). In Silte the following weredas are included: Dalocha and Lanfuro. Additionally, one wereda, Mareko in Gurage is included. In all these wereda's red pepper is the main crop cultivated for cash generation.

FIGURE 2.2
Selected zones from S.N.N.P Region

Source: http://www.ethiodemography
andhealth.org/http://www.ethiodemographyandhealth.org/

The total population of the Southern Nations, Nationalities and Peoples' Region (S.N.N.P) is around 15 million people. Of these 15 million 64,512 live in Mareko, 116,114 in Lanfuro, and 89,807 live in Dalocha. Most of the people, around 95%, live in the rural area (for the whole region: urban 1.495,557 and rural: 13.433.991) (CSA, 2007a).

It is estimated that only 4.5 per cent of the potentially irrigable land in Ethiopia is actually used[9]. In striking contrast to this finding is the fact that Ethiopia is endowed with huge water resources, even to the extent of winning the title: "water tower of Africa". The two zones, Gurage and Silte, contain some lakes and rivers available for irrigation but the main area is without these types of water resources and must rely on more ineffective water structures, such as small wells (groundwater) or small-scale water harvesting structures (rainwater) (CSA, 2007a). Hence, households in these zones rely on long cycle crops and consequently any fluctuation in rainfall distribution during the meher (rainy) season (either insufficient or excessive rainfall) reduces food and cash incomes at household level. However, if the rains are optimal, surplus production is possible due to the relatively fertile soils.

The zones consists of different ethnicities, and accordingly different religions. While in Dalocha and Lanfuro the majority practise Islam, in Mareko orthodox Christians and Protestants dominate the religious entities. As a result, Lanfuro and Dalocha wereda recently moved from the administration of Gurage to Silte Zone.

FIGURE 2.3
Elevation levels in Ethiopia
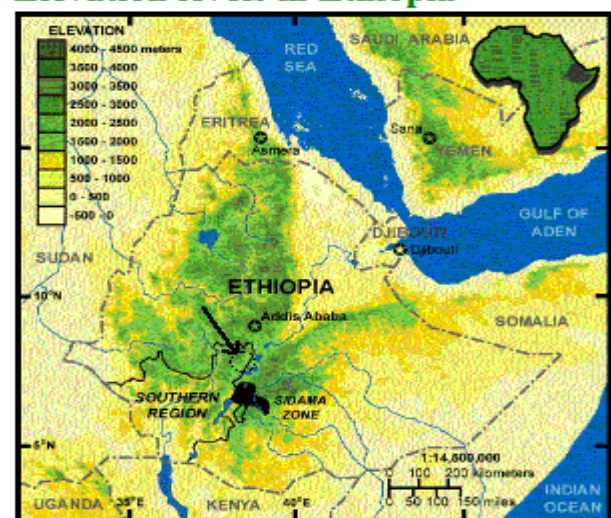
Source: adapted from www.africa.ufl.edu

S.N.N.P Region has multiple climatic zones. On the basis of altitude, rainfall and temperature the composition of S.N.N.P is as follows: semi desert 6.2%, hot (kola) 49.8% semi-hot (weina Dega) 36.8%, Highland (Dega) 6.5% and cool moist (wirch) 0.7%. The average annual temperature ranges

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[9] http://www.ethiopians.com/Main_FSS_Paper1.htm

from 16 ^{0}c to 25 ^{0}c. The rainfall pattern is bimodal with rains in the short rainy season (Belg) and rains in the long rainy season (Meher) with a mean annual rainfall of 500-2200cm[10].

Red pepper is best grown in a warm environment (Aklilu, n.d; Motes, n.d.). The day temperatures should preferable be between 23.9˚C to 29.4˚C with night temperatures ranging from about 10˚C to 15.6˚C (Smith, n.d.). It grows best at an altitude ranging from 1400 up to 2100 meter above sea level (m.a.s.l.). Pepper (capsicum annuum) is an 'annual plant' which requires a sandy and loam soil (Motes, n.d.) which is well drained and rich in organic matter, further it needs around 600-650 mm rainfall (Roukens, 2005). In Ethiopia the Capsicum grows best in the Rift Valley and similar areas around the country.

All three districts are partly located in the rift valley and about 200 kilometres away from the capital, Addis Ababa. The circle in figure 2.3 shows the area. The altitude ranges between 1500 to 2040 m.a.s.l. The annual average rainfall is less than 900 mm and the annual average temperature ranges 18-25 degree centigrade.

2.4 Summary and conclusion

Pepper is grown in many regions of Ethiopia and is an important ingredient for some of the most famous dishes of Ethiopian cuisine. Besides its popularity in Ethiopia, pepper can be used as raw material for extraction of oleoresin capsicum and paprika by the Ethiopian Spice Extraction Factory. Currently production of pepper is under severe threat by several diseases and is damaged by moisture stress. These problems are causing major issues with the supply of red pepper and threaten the sustainability of farmers' livelihood.

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[10] http://www.bestethiopia.com/ethiopian-regional-information/snnp.html

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3. THEORETICAL FRAMEWORK

This section is divided into three parts. The first part introduces the concept of value chains and gives a chronology of the applied approach 'global value chains' (GVC). Due attention will be given to two of the most important components of GVC: governance and upgrading. In the second part, literature on different farmer typologies is discussed, while the last part helps to connect empirical findings and supply chain analysis by means of institutions, transaction costs and social capital.

3.1 A chronological clarification of the use of the global value chain approach

The main research approach in this study is the concept of global value chains[11]. Inherent to this approach is the concept of value chain. Several definitions of a value chain have been given, but the one provided by Kaplinksy and Morris (2000) captures all distinctive facets and seems to transcend different discussions: "The value chain describes the full range of activities, which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), to delivery to final consumers, and final disposal after use" (Kaplinsky et al., 2000 p.4).

The concept of 'value chain' has evolved over time, and along the way it has been influenced by scholars from different 'ideological' schools. Most scholars seem to agree with the concept of value chains but they differ in their analyses and abstraction of empirical findings. Hence there is a multitude of approaches to be found today, each analysing the economic environment with its own set of tools. This section pays attention to those value chain concepts that lay on the basis of the GVC approach.

The origin of value chain analysis can be traced back to: the French '*filiere concept*' and Wallerstein's concept of a commodity chain. The *filiere* concept was developed in the 1960s as an analytical tool for empirical agricultural research (Faße et al., 2009). The approach was used to gain a more structured understanding of economic processes that underlie production and distribution chains in agricultural commodities. One of the main critiques of this approach is that it does not combine the different theories applied into a structured overarching framework (Raikes et al., 2000). Despite the potential benefits of the *filiere* approach to this study, a global value chain approach suits it better as it allows it to integrate social factors (Raikes et al., 2000) and offers a framework which links constraints, governance and upgrading.

In the 1970s, Wallerstein (1974) developed the concept of *commodity chains*, which is built upon the principles of world systems theory[12] (Faße et al., 2009). World systems theory is on its turn an elaboration of 'dependency theory'[13]. Both dependency and world systems

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[11] A justification of the selected value chain approach can be found in the introduction, section 1.4

[12] World systems theory introduced the semi-periphery to break the dichotomy between core and periphery. See footnote 14 for more information.

[13] One of the founding fathers of the 'dependency' concept is A. G. Frank who wrote in 1969: 'The development of underdevelopment'. He divides the world's nations into two groups: core and periphery. According to Frank (1969) the core is dominating the world through the capitalist system and exploits the periphery to sustain itself. Countries in the peripheral zone are locked in and to escape the stronghold of the core is basically impossible

theory have influenced one strand of value chains significantly. This strand' origin lies with commodity chains, then it changed into global commodity chains, and finally global value chains. But before discussing the last two concepts attention need to be given to Michael Porters' perspective on value chains which is influencing the GVC approach until today.

In the mid-1980s Michael Porter (1990) caused a shift in the concept of *value chains*[14] with his bestseller *Competitive advantage: Creating and Sustaining Superior Performance.* His theoretical framework focuses on a single firm in which activities are scrutinized on their value addition. Only those activities that do add value should be maintained and those that do not should be outsourced or eliminated. His focus on a single firm as a standalone entity received most of the critique. Scholars claim that Porters approach is neglecting the analysis of up or downstream activities beyond the company (Faße et al., 2009). The approach is also thought to minimize the effect of power relations between companies, and by doing so he seems not to be concerned about equity between different chain actors (Laven, 2010). Although Porters' approach received quite some criticism, its focus on individual firms has focused GVC scholars on particular strands of a value chain.

In the 1990's, scholars within the structuralist school, Gereffi et al., (1994) launched the *global commodity chain* approach, derived from Wallerstein's commodity chain (Bair, 2005). Of primary concern in this approach is the explanation of the dynamics of the distribution of value chain activities in a capitalist world economy (Faße et al., 2009). Although this concepts original concern was agricultural products, Gereffi was mainly concerned with industrial commodity chains. Within this framework Gereffi (1994) established four tools through which a value chain can be analysed: (1) input-output structure, (2) territorial (international) structure, (3) institutional framework, and (4) governance structure.

Input-output structure and geographical coverage can be used descriptively to illustrate the specific chain configuration. The governance structure is meant to identify the conditions under which key (or lead) agents incorporate subordinate agents through their control of market access and information. By looking at two distinct types of governance, buyer versus producer driven chains, the approach exposes power relations within the chain. For now, it is sufficient to note that the distinction between producer and buyer driven chains is made based upon the agent (producer or buyer) who is exerting power throughout the chain. In other words, who is responsible for chain configuration (Gereffi, 1994). More recently, the institutional dimension has gained interest (see Daviron and Ponte, 2005; Gibbon 2001). These authors argue that it is essential to include the institutional framework in value chain analysis as it recognises that chains are not 'closed systems'. Value chains receive external inputs in terms of knowledge management from technical research institutes, extension services, and are influenced by trade unions, NGOs, driven by national governments or international organisations through policies and are influenced by social structures (e.g. the relation between farmers and traders) (Laven, 2010). Thus, the global commodity chain, by using four related

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(Frank, 1969). Its primary concern, the same for the concept of commodity chain (Wallerstein), lies with power relations and inequalities between the different nation-states in the capitalist system. This theory opposes the theory of market economics, such as those of M. Friedmann and Hayek, which favour the capitalist system and criticizes structuralists for their deterministic thinking (e.g. the impossibility of peripheral countries to become core).

[14] Porter distinguished two important value-adding activities of an organization: primary activities (inbound logistics, operations, outbound logistics, marketing, and sales) and support activities (strategic planning, human resource management, technology development, and procurement).

concepts, lays down an overarching framework that seeks to explain value chains from a holistic perspective.

In the early 2000s, a schism opened between global commodity chain scholars. Bair (2005) highlighted how recent GCC research, adopting a global value chain (GVC) terminology, progressively shifted from: "*a holistic view of global processes and their social consequences towards a firm-level, performance-oriented focus*" (Bair, 2005). While some authors seem more inclined to the concept of GCC (Bair, 2005; Ponte, 2009; Gibbon; 2001; 2008) others choose to focus on the new constructed concept of global value chains (Gereffi, Humphrey and Sturgeon, 2005). This new school of thought (GVC) is supposed to capture a wider variety of products, some of which lack commodity features and it is supposed to correct that: "*the global commodity chains framework did not adequately specify the variety of network forms that more recent field research has uncovered*" (Gereffi, 2005). Gibbon specifies further by recognizing that: "*supply chains do not make up homogeneous entities, in fact they are made up of several separate 'strands' with different governance structures in one*" (Gibbon, 2008). Secondly, the GVC recognizes the benefits of Porters' single firm orientation, while simultaneously scrutinizing links between the different stakeholders. Hence, this study adopts the GVC approach because of the overarching framework it provides, its ability to focus on particular strands within the value chain, and the relative ease with which it incorporates institutional and social factors.

3.1.1 Governance:

The main assumption of governance is the realisation that interactions between firms along a value chain show forms of organisation rather than being simply random interactions (Kaplinksy, 2000). Kaplinksy (2000) defines governance further by stating that: "*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*" (Kaplinksy, 2000). The concept of governance has recently been captured by Gibbon, Bair and Ponte (2008) in three distinct forms: governance as 'driving', governance as 'coordination', and governance as 'normalisation'[15].

'Driving' governance brings order to novel network structures (Gibbon, Bair, and Ponte, 2008). Gereffi (1994) constructed a typology, which classified a supply chain as either producer- or buyer driven. Buyer driven chains are to be found primarily in labour-intensive sectors, where market information, product design and marketing/advertising costs set the entry barriers. While producer driven chains are mostly found in sectors with high technological and capital requirements, where capital and proprietary know-how constitute the main entry barriers (Gereffi, 1994). The two-type typology does not only function as a descriptive model, it identifies those dominant actors (lead firms), who are responsible for upgrading possibilities, knowledge transfers, and coordination within the value chain (Gereffi, 1994; Faße et al., 2009). According to some scholars, the dichotomous typology failed to encapsulate empirically observed governance types, and most studies showed a pure buyer-driven chain, which makes the model more or less obsolete (Gibbon, 2008; Faße et al., 2009).

An addition to the dichotomy between buyer and producer is given by Gibbon (2001) who introduced the concept of 'trader driven chains'. According to Gibbon (2001), international traders govern a growing number of agricultural commodity chains. These chains have

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15 'normalisation' indicates: realigning to a given practise so that it mirrors or materializes a standard or norm. This type of governance is not used throughout the research.

the following characteristics: relatively low-value to weight ratio products, labour-intensive raw material production, globally dispersed and locally discontinuous (including seasonal) supply pattern, easy entry by new suppliers and low price-elasticity of demand. Traders in these chains face high entry barriers, because of high levels of working capital, since their main profitability is derived from volume rather than from margins. An interesting finding by Gibbon is that relations downstream with processors tend to be not only longer-term but also denser and trust-based (Gibbon, 2001).

The second contribution to governance structures is termed governance as 'coordination' (Gibbon, Bair, and Ponte, 2008). In 2005, Gereffi, Humphrey and Sturgeon brought order in the pre-2005 published empirical studies on governance in value chains and published the article: 'The governance of global value chains' in which they argued for a fivefold typology of governance. Although the typology to be presented is initially constructed for industrial purposes, some theoretical elements can be applied to agricultural governance structures (Gereffi, et al., 2005).

The authors of the model acknowledge - as do most other frameworks that seek to explain industry organisation – that market-based relationships among firms and vertically integrated firms (hierarchies) make up opposite ends of a spectrum of explicit coordination (Sartorius, 2007). However, Gereffi, Humphrey and Sturgeon (2005) have added three distinct types in the middle: modular, relational, and captive chains. To decide which type of governance applies to a specific chain, three key variables were introduced, based on earlier work of Sturgeon (2002): complexity of transactions, ability to codify transactions and capabilities in supply base. The definition of the variables is as follows (Sturgeon, 2002):

A. The complexity of information and knowledge transfer required to sustain a particular transaction, particularly with respect to product and process specifications;

B. 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

C. the capabilities of actual and potential suppliers in relation to the requirements of the transaction.

The five governance types and three variables are brought together in the following figure.

FIGURE 3.1
Five governance types
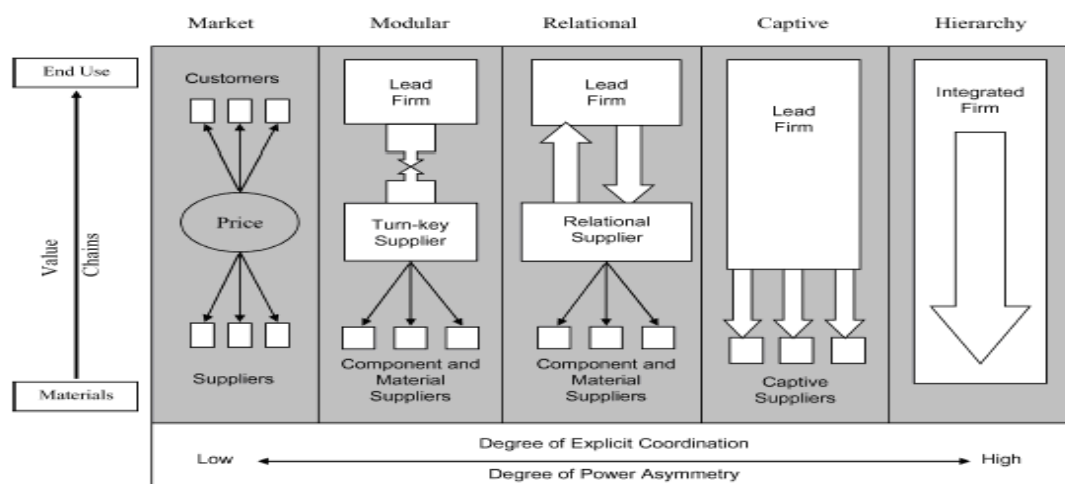
Source: adapted from Gereffi, Humphrey and Sturgeon (2005)

In each governance type power relations are differently organised and this affects up-grading responsibilities and possibilities. There is some critique that this approach lacks measurable proxies or indicators (Faße et al., 2009). This generates problems in an industrial setting, and makes it even more complicated in an agricultural chain.

1. Markets:
Transactions are easily codified. Suppliers have the capability to make the products in question with lit-tle input from buyers, thus transactions can be governed with little explicit coordination.

2. Modular value chains.
Ability to codify extends to more complex products. Technical standards simplify interactions.

3. Relational value chains.
Product specifications cannot be codified, transactions are complex, supplier capabilities are high. Mu-tual dependence, may be regulated through reputation, social and spatial proximity, family and ethnic ties, and the like.

4. Captive value chains.
Ability to codify is high, complexity of product specifications are high, but supplier capabilities are low (suppliers are locked in, face significant switching costs).

5. Hierarchy
Product specifications cannot be codified. And no highly competent suppliers can be found.

This study is about two agricultural products: red pepper and paprika. Literature shows that governance forms in most agricultural value chains resemble the 'market type of govern-ance' (Laven, 2010). Daviron (2005) explain 'market' type chains further by introducing a dichotomy based on quantity (traditional) and a chain based on quality (modern). Agricultural commodities that are traded on the basis of quantity (traditional) are characterised by full arm's length market relationships. Products are standardized and produced without reference to the needs of particular buyers and with limited information flowing along the chain. Many small producers are involved and the output of one producer is much the same as that of an-other (Daviron, 2005). This implies low barriers to entry since all products are essentially the same (Keane, 2008).

The second type of chain (modern) relates to quality. In the shift towards competition over quality as opposed to price (differentiated products), the amount of information that passes between agents in GVCs needs to increase. This necessitates a transition in governance structures and linkages between GVC actors and changes in production localities. This transi-tion creates opportunities for some producers and limitations for others (Daviron, 2005; Laven, 2010). Thus, the market based 'traditional' GVC has a much looser form of co-ordination, characterised by 'arms-length' transactions, than the modern chain with more co-ordination between stakeholders..

In summary, the shift away from the buyer versus producer driven typology into gov-ernance as coordination has implied two things: first, the explanatory scope of the governance concept is narrowed from the length of the chain in the former to the inter-firm transaction at a specific node in the chain in the latter. The theory of GVC governance suggests, in contrast to GCC, that power is a contingent property of only certain types of inter-firm coordination (Gibbon et al., 2008).

3.1.2 Upgrading
The final element of supply chain analysis to be discussed is the concept of upgrading: identi-fying improvements that can be made to firms, clusters and chains. There are differences in

opinion on the exact definition, typology and use of this concept. There are two broad orientations within the literature on upgrading. One relates to identifying the sources of capabilities that make upgrading strategies possible, and the other orientation is more concerned with 'development' in terms of examining what conditions and trajectories can lead to an 'improved situation' or in the words of Ponte & Ewert (2009) to 'a better deal' for firms in developing countries. This study will contribute to the latter orientation by providing an upgrading framework to discuss different upgrading strategies in terms of efficiency and equity[16].

One of the most commonly used upgrading frameworks is given by Humphrey and Schmitz (2002) who established a typology of four types of upgrading: product, process, functional and inter-sectoral. Product upgrading refers to introducing new products, or improving old products faster than rivals. Process upgrading, refers to increasing efficiency of internal processes, both within individual links, and between the links in the chain. Functional upgrading refers to changing the mix of activities conducted within the firm, or moving the locus of activities to different links in the value chain and finally inter-sectoral upgrading is used to classify in which a new value chain is integrated within the business (Humphrey and Schmitz, 2002).

Although this framework is often applied in upgrading literature, there are several difficulties in working with this four-type classification. First, it is sometimes difficult to distinguish between product and process upgrading, especially in agro-food products, where the introduction of new processes generates new categories of products (e.g., organics, ''sustainable'' products) (Ponte et al., 2009). Second, process upgrading, can put forward a strategy in which matching food safety, technical or socio/environmental standards may indeed lead to products with ''better intrinsic qualities,'' but these do not necessarily translate into higher value to the producer (ibid). Third, product and process upgrading trajectories often do not take into account other venues of ''doing things more competently'' such as matching strict logistics and lead times (time-to-market) and delivering supplies reliably and consistently time after time (a major challenge in agro-food products) (Laven, 2010). Related to the last upgrading strategy, the status of ''inter-sectoral'' upgrading is unclear, as it relates to a trajectory of upgrading, while the other three categories describe what aspect of a given business is being upgraded (Ponte et al., 2009).

Similar to the concept of governance, the concept of upgrading is mostly applied to industrial sectors. Therefore, Gibbon (2001) proposed, analogous to governance, an alternative classification for upgrading within the agricultural sector: 1) capturing higher margins for unprocessed commodities, for example through higher levels of productivity or by moving up the grade ladder, 2) producing new forms of existing commodities, and 3) localising commodity processing (Gibbon, 2001).

Recent empirical evidence shows a more complex set of upgrading trajectories. Some of these trajectories, particularly in Africa and in agro-food value chains, suggest that upgrading strategies which are perceived by some parts of GVC literature as "downgrading" may co-exist with traditional upgrading paths for developing country firms, such as benefitting from economies of scale (Ponte et al., 2009). Ponte (2009) adds a new perspective to the upgrading debate: reaching a better deal. This does not necessarily mean 'up'grading. He explains by stating that holding on to the same position, or even specialising in a lesser value activity can also be part of reaching a better deal. The strategy should be about reaching a balance be-

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[16] (see chapter 7: upgrading framework for a detailed discussion on efficiency and equity).

tween rewards and risks. The upgrading framework in chapter 7 pays tribute to this notion by discussing upgrading strategies from different angles and at different scale levels.

In summary, upgrading strategies are classified by Humphrey and Schmitz (2002) as product, process, functional or inter-sectoral. Gibbon (2001) has added some upgrading strategies tailored to agricultural food chains, and a recent upgrading paper by Ponte et al., (2009) has shown that upgrading can have different outcomes if one changes his perspective. Keane (2008) makes clear that upgrading interventions have a direct effect on governance types and vice versa (Keane, 2008).

3.2 Farmer typologies

This section gives an introduction to several farmer typologies from different disciplines and it explains the need for a more value chain related farmer typology. The focus of this research is predominantly on the relation between constraints, governance and upgrading possibilities for small-scale farmers. While Keane (2008) identified that governance and upgrading are related and mutually influencing, Laven (2010) makes explicit that upgrading has different effects on different types of farmers. This study contributes to a value chain farmer typology by suggesting a variable which can be used as a proxy for reliability of supply.

A typology is constructed in order to analyse a complex reality, to order subjects, to analyse technical, managerial, and innovation issues. While fully acknowledging the main pitfall of typologies, the over simplification of reality, it is still thought to be useful. As Landais (1998) puts it, it helps to bring forward: "*relevant solutions adjusted to the needs and means of different types of farms*". Put differently, it helps development professionals to target their strategies directly to the aimed target population (Schwarz et al., n.d.).

In innovation studies, farmers are grouped together according to their common worldviews and/or management practises (Schwarz et al., n.d.). This classification aims to expose indicators that help to explain farmers adaption to innovation. Within agricultural studies, it is common to see farmer typologies in relation to 'commercialisation'[17]. This concept groups farmers according to their 'commercial' mindset and behaviour within the agricultural sector.

One debate which is still underlying scholarly work today is the issue of defining peasants versus farmers. Chayanov (1966) hold the idea that households, especially peasant households which practise subsistence farming, will tend to produce only the amount of food they need to survive. A farmer is distinctive from a peasant in that they try to sell their products on a market. While the peasant is merely surviving, the latter is thought to be profit minded (Chayanov, 1966). Thus, the opposite of commercialised farmers is subsistence farmers.

Leavy & Poulton (2007) recognize the falsification in treating commercialisation as a dichotomy between subsistence and commercialised farmers. In their article: "*Commercialisations in Agriculture* " they discuss several ways of measuring commercialisation: CCI[18] (crop commercialisation index), ICI[19] (Input commercialisation index), ICE (integration into cash economy), HCI (household commercialisation index), and a more descriptive typology

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[17] There is no common ground in defining the concept. A loose and all encompassing definition would be: a concept that relates to the marketing of agricultural output, the choice of product, and input use decisions all based on the principles of profit maximisation (Leavy & Poulton, 2007).

[18] measured by gross value of all crop sales/gross value of all crop production x100.

[19] measured by value of inputs acquired from market/agricultural production value.

of food production systems. The latter typology is thought to treat commercialisation from a pluralist perspective since it focuses on level of market orientation, farmers objective, sources of inputs, product mix, and household income sources (Pingali and Rosegrant, 1995 as in Leavy & Poulton, 2007).

Within value chain research most commonly producers are classified according to their size; large and small-scale (Gibbon, 2001; Kaplinsky, 2004 as in Laven, 2010). From the perspective of governance, Sturgeon (2002) classified producers in three types of supply relationships, based on the degree of standardization of product and process: (1) the 'commodity supplier' that provides standard products through arm's length market relationships, (2) the 'captive supplier' that makes non-standard products using machinery designed to the buyer's needs, and (3) the 'turn-key supplier' that produces customized products for different buyers by using flexible machinery (Sturgeon, 2002; Gereffi, 2005). This typology is highly related with the five types of governance provided by Gereffi (see section 3.1.1 on governance).

The typology of producers (small and large scale) given by Gibbon (2001) does not pay tribute to the heterogeneous complexity of farmers in third world countries. Multiple studies (see for example Mussema, 2006, Leavy & Poulton, 2007; Laven, 2010) have shown that other variables (inputs, credit) are just as important in explaining the extent of commercialisation. Secondly, the typology given by Sturgeon (2002) aims to expose the foundations of power between supplier and downstream actor, but it does not provide a deeper understanding of different types of farmers and their success.

This research aims to extend value chain producer typologies within an agricultural environment by introducing a new variable that can be used as a proxy for reliability of supply. Section 4.5 discuss this new variable and section 6.3 provide the outcome.

3.3 New Institutional Economics

For a strong and in-depth analysis of a value chain, and in particular an agricultural value chain, additional concepts besides those offered by GVC analysis (governance and upgrading) are needed. Analysing specific points within the value chain, such as the local market, can help to clarify the type of governance present and the possibilities for upgrading. Instead of analysing the exchange at the market from a purely neoclassical point of view, this thesis applies concepts from the school of *New Institutional Economics* (NIE). (NIE) is an economic perspective that attempts to extend economics by focusing on the social and legal norms and rules that underlie economic activity[20]. Three components; institutions, transactions costs and social capital will be discussed.

Looking through the lens of neoclassical economics the exchange at the market would be explained by prices, and outputs, through supply and demand, by means of rational choice theory (profit maximization) (McMillan, 2002). Critics of the neoclassical approach state that the assumption of humans as rational decision makers is ignoring important aspects of human behavior. This critique is captured by the idea that: "*the economic landscape cannot be fully understood without paying attention to the various social structures on which economic activity depends and through which it is shaped'. Thus, the behaviour of economic actors is influenced by the socio-cultural context they are active in*" (Helvoirt, 2009). The school of NIE addresses these issues by focusing on the social component of economics and on institutions as such (Asefa, 2003).

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[20] http://en.wikipedia.org/wiki/New_institutional_economics

Markets, to works as they should, need institutions (McMillan, 2002). A market is any one of a variety of different systems, institutions, procedures, social relations and infrastructures where by persons trade, and goods and services are exchanged[21]. Without analysing the concept of institutions in detail (there is a huge debate about what should be the exact definition of an institution[22]) the following definition is used throughout the thesis: institutions *'represent the symbolic blueprint for organizations, they are the set of rules, written or informal, governing relationships among role occupants in organizations like the family, the schools, and the other major areas of social life'* (Portes and Smith, 2008 in Helvoirt, 2009). A sustainable institution stems from the fact that they can usefully create stable expectations of the behaviour of others. Market-supporting institutions ensure that property rights are respected, that people can be trusted to live up to their promises, that externalities are held in check, that competition is fostered, and that information flows smoothly (McMillan, n.d.).

Besides formal institutions, societies construct informal institutions: *"these are rules by which people interact with each other to make ordered social life possible. Culture, business practices, government laws, regulations and many different organizations interact to shape the way a market works"* (Helvoirt, 2009). Informal norms are rules of a group or community that may or may not be explicitly stated and that rely on informal mechanisms of monitoring, such as social approval or disapproval. Norms governing interpersonal relationships both constrain and facilitate behaviour by defining the structure of incentives – material and nonmaterial – for individuals situated in a group. Formal norms are explicit rules that rely, in addition, on formal mechanisms – the state and organisations – for their monitoring and enforcement (Brinton, 1998).

It is thought that institutions (formal and informal) can constrain and enable behaviour. For example the existence of rules implies constraints: people are bounded by those rules. However, such a constraint can as well open up possibilities: it may enable choices and actions that otherwise would not exist (Hodgson, 2006).

Hence, analysing the exchange at the market place from an institutional perspective helps to identify effective channels through which value chains can be strengthened, or upgraded, or to uncover barriers that can block exchanges between actors in the chain that in turn can affect the livelihoods of farmers negatively (Laven, 2010).

3.3.1 Transaction costs

One of the assumptions of neoclassical economics is that each economic actor has complete access to market information. NIE states that processing full market information for all economic actors is nothing more than 'utopia'. While neoclassical theorists only focus on production costs that precede an exchange, NIE is as well concerned with: *"the time and money spent locating trading partners, comparing their prices, evaluating the quality of the goods for sale, negotiating agreements, monitoring performance and settling disputes"*[23] (McMillan, 2002). Hence, institutions are supposed to minimize these transaction costs and to facilitate market exchange.

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[21] http://www.google.nl/search?hl=nl&rlz=1G1GGLQ_NLNL350&defl=en&q=define:Markets&sa=X&ei=QCpxTK21E5WSOJjerbAL&ved=0CBUQkAE

[22] North's, defines an institution as the "rules of the game". both formal rules and informal constraints such as norms, conventions, and codes of conduct that provide the structure for human interaction (North 1990). Granovetter on the other hand emphasize the enabling capabilities of institutions.

[23] There are two underlying assumptions to transaction costs. Opportunism (the possibility that people will act in a self-interested way) and bounded rationality (is the notion that in decision making, rationality of individuals is limited by the information they have).

Secondly, the concept of transaction costs helps to identify what type of governance structure is empirically found (see part 1 on governance). The approach uses three variables that help to position a transaction as an on spot market transaction or as a transaction that takes place in a vertically integrated firm. The first variable, frequency, is about how often the transaction takes place, and the accompanying question is, is it worthwhile to integrate the transaction into the organisation or is it more effective to leave it to the market? The second variable, uncertainty, suggest that if the transaction and or the outcome is uncertain, than it is more likely to be integrated in the firm. And finally asset specificity: are the inputs used only relevant to the specific transaction, or can they be used for other transactions as well? These three variables will, according to the theory, determine whether transactions costs will be lowest in a market or in a hierarchy. The concept is presented in the table below.

FIGURE 3.2
Transactions cost approach

		Asset specificity		
		Low for both parties	High for both parties	High for one party, low for one party
Uncertainty	High	Contract/vertical integration	Vertical integration	Vertical integration
	Low	Spot contract	Long-term contract	Vertical integration

Source: http://users.ox.ac.uk/-jesu0073/TCE.pdf

The concept thus predicts that in some cases a transactions is likely to take place in an open market, while in other situations it might be better to let the transaction take place indoors. A drawback of this approach is that it does not account for reputation and trust. Including these issues could generate different results. The next section will discuss the concept of trust.

3.3.2 Social capital

There are a variety of related definitions that define social capital[24]. It has been criticized as meaning too many things to too many people (Bebbingtion, 2008). For political scientists such as Putnam, the primary focus is on the nature and extent of the network structure itself (ibid). According to Putnam '*the enhancement of cooperative undertakings via trust-based relationships stimulates the sharing of knowledge, encourages joint innovations and hence improves productivity and competitiveness of an economy*' (Putnam in Helvoirt, 2009). Portes (2000) advocates the use of the concept of social capital in the original way as intended by Bordieu. Portes rejects the use of the concept on more aggregated levels, such as social capital as a property of cities or nations which is qualitatively distinct from the application to the individual (see Portes, 2000). Hence, this thesis will apply social capital as a feature at the individual unit of analysis.

At individual level several core, recurring ideas can be distinguished. First, it is taken to refer to qualities inherent in or deriving from people's social relationships. Second these

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[24] "The more comprehensive the validity – or scope – of a term, the more it leads us away from the richness of reality since, in order to include the common elements of the largest possible number of phenomena" (Portes, 2000).

qualities can have important implications for other dimensions of economic and socio-political life. Bourdieu, building upon the work of Weber (Weber defined power as the chance that an individual in a social relationship can achieve his or her own will even against the resistance of others (Weber, 1968)), constructed the idea of social capital which puts the emphasis on conflicts and the power function (social relations that increase the ability of an actor to advance her/his interests) (Siisianen, 2000). Bordieu sees social capital as a resource just like any other (land, money, etc.). This specific type of capital can be used to enhance one's wealth and status, to marginalize the wealth of others, or both (ibid).

Granovetter states that: "*all individuals are embedded in a structure of social relationships from which resources are drawn*". Social relationships generate trust as well as developing and enforcing norms of behaviour. Thus, social capital lubricates relationships between actors and glues networks together through trust. This thesis will use the concept instigated by Fukuyama (2001) who uses social capital in the sense that: "*Social capital is an instantiated informal norm that promotes co-operation between two or more individuals. In the economic sphere it reduces transaction costs*"(Fukuyama, 2001). Trust is needed when role expectations and familiar relationships no longer help us to anticipate the reactions of our individual or collective interaction partners (Siisianen, 2000). Trust is either established informally between business people, or by formalized contracts endorsed in law (Bebbington, 2008).

Hence this study analyses the concept of social capital through the lens of power, and trust at the level of the individual. Both these concepts help to explain economic transactions between stakeholders within the chain. The effect of institutions and social capital in the form of trust can be read in box 3.1.

> Box 3.1: An arms length market in India
>
> In the 1970s, an archetypical arms length market (in the form of fresh milk) existed in India. At local markets it was hard to find high quality fresh milk, because sellers routinely watered it down. Buyers could not identify the milk's butterfat content, and as a result the low-quality milk drove out the high-quality milk. The National Dairy Development Board launched a campaign to prevent adulteration of milk. They provided inexpensive machines to measure butterfat content at several steps in the value chain as the milk moved from farmer to wholesaler to seller. In addition the board set up payment schemes making the price of milk reflect its measured quality and created brand names to give buyers trust in what they were getting. As a result of this coordinated initiative, quality improved and consumption rose.
>
> (McMillan, n.d.)

3.4 Summary and conclusion

Part 1 introduced the concept of value chains from the beginning of the *filiere* concept up to global value chains. In the approach applied in this research, GVC will take a central position, but several ideas from other school will be used simultaneously. The second part discussed farmer typologies. Typologies are highly relevant when talking about upgrading strategies. According to Laven (2010) no farmer is equal and upgrading strategies if targeted without careful consideration are likely to intensify pre-existing power relations. Part 3 introduced three concepts related to the new institutional economic approach, which can be used to connect empirical findings to global value chain analysis.

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4. RESEARCH DESIGN

The research has taken place in Ethiopia from March to May 2010. The methodology employed is a combination of qualitative and quantitative approaches. The first part of this chapter outlines the research questions, the methodology and its limitations. Part 2 discuss hypothesis in which explanatory variables are linked to the dependent variable and the final part wraps the core ideas of this research in a conceptual model.

4.1 Research question(s)

The aim of this study is to identify factors that hamper exports, to identify farmer characteristics that contribute to supplying on a regular basis, and to provide a framework through which upgrading strategies can be discussed. The following research question is central throughout the study:

> **"Which supply side constraints are impeding a continuous supply of high quality red pepper and paprika for export?**

The central question has been divided into five sub questions which as a whole are expected to formulate an answer to the central question.

   1) **What is the basic structure of the red pepper/paprika chain in Ethiopia?**

This question aims to position all stakeholders within the chain. This question is answered in the scoping interviews and can be found in chapter 5: Chain configuration and governance types.

   2) **Which supply side constraints do farmers, traders, exporters, the Ethiopian Spice extraction factory, and other institutional stakeholders face in producing and trading red pepper/paprika?**

This sub-question addresses all the constraints that the several stakeholders encounter in dealing with red pepper and paprika in Ethiopia. The research question will be answered in chapters 5: Chain configuration and governance types and chapter 6: Small-scale farmers in pepper.

   3) **What type of governance can be found in the red pepper/paprika supply chain? And to what extent is the institutional environment hampering or constraining the pepper/paprika chain?**

Governance is a very important component of value chain research. This sub-question uncovers the explicit coordination between stakeholders within the chain. This research question will be answered in chapter 5: Chain configuration and governance types.

   4) **Which variables have a significant influence on success (regular supply) of small-scale farmers?**

This question is explored by means of multiple regression analysis. The hypothesis are presented in chapter 4 and the sub-question will be answered in chapter 6: Small-scale farmers in pepper.

> **5) What are feasible upgrading strategies for enhancing improvements in terms of efficiency and equity for the various stakeholders in the red pepper/paprika value chain?**

The second main component of value chain research is upgrading. The question will be answered in chapter 7: Upgrading framework.

4.2 Methodology

The methodology applied in this study has a quantitative and qualitative nature, also known as a q-squared method (Hulme, 2007). A justification of this dual approach lies in the recognition that both techniques have their merits and weaknesses, but a combined approach should be able to overcome these problems and reinforce strengths (see Hulme, 2007). The fieldwork for this study can be divided into four phases: 1) scoping interviews in Addis Ababa with main stakeholders 2) scoping interviews and sample frame construction in the Southern Region, Gurage and Silte 3) conducting questionnaires in Southern Region and 4) in-depth interviews in Addis Ababa with main stakeholders, market visits in Addis Ababa and local markets, and focus group discussions.

4.2.1 Selection and methods of data-collection/analysis

The research is composed of primary and secondary data collection. Secondary data collection include scientific literature review, use of documents from the Ethiopian Central Statistical Agency (CSA), the Ethiopian Customs Authority (ECA), the International Trade Centre (ITC) and the List of Ministry of Finance. This section explains the primary data collection along the four phases and pays tribute to the q-squared method, by discussing methodology around the qualitative, quantitative, and again qualitative approach (Hulme, 2007).

In the first phase scoping interviews in Addis Ababa were held with EEA staff, the Ethiopian Spice Extraction Factory, consultants, the Ethiopian seed enterprise, and federal agricultural specialists to identify relevant stakeholders and to uncover the most apparent constraints in the pepper and paprika chain. These interviews were done in an open manner, which has the advantage that respondents can freely provide their opinion about the major constraints (Hart, 2005). Simultaneously, a first draft of the questionnaire for the quantitative study to farmers constraints and characteristics was constructed.

In the second phase scoping interviews were done with farmers and local agricultural extension workers in the Southern Region after receiving approval of the local chairmen. Furthermore, the first pilot study of the questionnaire has been undertaken, and simultaneously the sample frame was constructed (see 4.3.3.).

In phase 3 the final structured questionnaire (see appendix A) was compiled. The aim of the questionnaire is to identify major constraints of the farmers and to give input for the farmer typology. The questionnaire consisted of the following topics: demographics (age, education), market inputs (fertilizers, chemicals, seeds), best practices (sowing, transplanting, harvesting), social aspects (*geza*, other work) and market outputs (kilo's of pepper sold). Four enumerators were trained and instructed in two consecutive days (they have been trained on interview techniques; idea of the question; etc..). The questionnaire was translated in close collaboration with the researcher into Amharic to guarantee consistency and supervising pos-

sibilities. Four enumerators conducted the questionnaire under direct supervision from the researcher resulting in 273 completed questionnaires.

The last phase consisted of further in-depth interviews based upon semi-structured questionnaires with key informants from Southern Region including development agents, union officials, agricultural research institutes, traders (local, regional, and national), wholesalers, retailers, and brokers, and from Addis Ababa, including exporters, the spice extraction factory, consultants, non-governmental organisations, investors, and officials from the federal agricultural department. In addition to the interviews, findings of the fully structured questionnaire were discussed with farmers in three focus group discussions and several markets in the region and capital were visited.

The idea behind the four phases is not only to pay tribute to the q-squared approach, but also to triangulate the data by using interviews, questionnaires, data-analyses, and observations to guarantee the validity and reliability of answers (Hart, 2005).

The quantitative data has been entered by three data-entry workers. The final dataset was fully controlled and checked by the researcher, and finally it was analysed with the use of SPSS 17.0 (Statistical Program for Social Scientists). SPSS is used in two ways: First to run a multiple regression model which identifies variables that have a significant influence on the dependent variable, and also to provide descriptive statistics, such as frequencies, means, and graphs (see chapter 6 Small-scale farmers in pepper for the final model and 4.6 of this chapter for the hypothesis).

Most qualitative data, received through interviews, has been tape recorded and has been fully transcribed. All fragments of each interview were 'coded', and after exploration of these codes, several themes emerged under which all fragments could be classified. On the basis of these themes, a structured analysis of the interview could be carried out.

4.3 Sampling method

The sampling method followed a multistage sampling technique (Hart, 2005). Some steps have used purposive sampling, while others used stratified random sampling techniques (see 4.3.2 study population). But first the research population is defined.

4.3.1 Research population farmers

The theoretical population, also known as the universe, indicates who belongs to the research population and who does not (Hart, 2005). For the quantitative part of this research the theoretical population consists of small-scale farmer households, who grow hot pepper and/or paprika in Ethiopia. For the objective of the research, however, the theoretical population needs to be operationalised further. Those farmers that have less than 0.5 hectare of (registered) land are thought to be subsistence farmers (their land size is considered to be insufficient for significant sale of red pepper), which makes them irrelevant for the purpose of the research. Secondly, only those farmers that have produced red pepper, or tried to produce, at least once in the last three years have been included in the population. Thus, those that did not allocate land to pepper in the last three years are excluded. Finally, farmers that have been selected, but have since moved elsewhere are not part of the population. This brings a bias, since out-migration could be considered as an interesting strategy for farmers to pursue but due to logistical constraints it is impossible to include them in the research. Thus, the findings of this study aim to generalise to the following population: red pepper/paprika farmers with more than 0.5 ha of land who have allocated land to pepper in the last three years, are still present in the selected area.

4.3.2 Study population

The actual study population is a sample from the theoretical population. The unit of analysis remains the same (small-scale red pepper grower, with more than 0.5 ha, etc.), but the geographical unit, Ethiopia, is refined to one region out of 3 potential ones (S.N.N.P, Amhara, Oromia)[25].

In phase two, the study population was developed. The first stage of the sampling method was done purposively. Ethiopia consists of 9 regions, of which 3 are considered as pepper producing regions: (Amhara region, Oromia and S.N.N.P). The southern region has the most potential[26] for pepper production (CSA, 2007b; 2008; 2009)[27]. The central statistical agency (CSA) reports that the production level of this area is around 674117.96 quintals[28] and the total population in this area is around 10 million people, of which 93% belongs to the agricultural population (CSA, 2007a). Within this region two zones have been selected, based upon their potential in red pepper production, their supply of red pepper for exports (Roukens, 2005), their proximity to Addis Ababa, and their need for poverty reduction. These zones are Silte, and Gurage[29]. Their respective production levels are 246852.59 and 204,627.16 quintals. Within these zones there are several sub cities (weredas) of which a selected group has high potential. In Silte zone, the four most promising weredas are Dalocha, Lanfuro, Santuro, and Silte wereda. Two of these, Lanfuro and Dalocha have been randomly selected. In case of Gurage zone, one wereda, Merekko wereda has been selected based upon its high production level, and for its renown high quality red pepper.

A further step in the sample frame was the selection of the villages (kebeles). In all three weredas, in collaboration with wereda's agricultural specialists (development agents), a list of ten productive kebeles has been compiled. From these ten, two kebeles were randomly selected per wereda, with the exception of Dalocha in which three villages were selected (see figure 4.1, red dots).

FIGURE 4.1
Research location (kebele)

Source: adapted from www.googlemaps.com

4.3.3 Sampling frame

At village level, with the approval of, and in collaboration with the local chairman and development agent, around 55 farmers were selected, with systematic random sampling[30]. In most of the kebeles a list of

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[25] The Ethiopian government structure is as follows: federal, regional, zone, wereda, kebele, and sub-kebele

[26] High potential is used, since this research seeks to identify constraints to exports, and the assumption is that high potential areas are most likely to be integrated in an export chain.

[27] Each year the CSA publish the document: a sample survey of Agricultural production. The production of red pepper for the last three years has been examined to see which zones have the most potential.

[28] 1 quintal equals 100 kilogram

[29] Alaba special wereda, deserves to be in the list, but because of logistical constraints it could not be included in the research.

[30] Systematic sampling is a statistical method involving the selection of elements from an ordered sampling frame. The most common form of systematic sampling is an equal-probability method, in which every k^{th} element in the frame is selected, where k, is the sampling interval.

the ministry of finance with all registered households, and their respective land size was at hand. The names on the lists presented the household head, which was selected for the purpose of the research, since it was assumed that he or she would have the right knowledge to answer the questions. The privacy of the farmers who participated in the research is guaranteed, since the combination of names and answers is only available to the researcher.

4.3.4 Response

Farmers on the initial list totalled 420, of which 300 participated and 273 ended up in the final database. In the figure to the right, the expected and the actual included sample are listed. The response rate is 69% (273/420x100). Of those that did not participate in the research, 27 were part of the second pilot study, and the rest moved, passed away, were ill, or did not want to cooperate. It has to be said that not all farmers on the list were asked to attend the meeting. On average about 55 out of 65-70 were actually informed.

TABLE 4.1
Sample size

		Expected	Included
Lanfuro	Warisha shanka	59	38
	Rapi	66	57
Dalocha	Abot Tirora	60	28
	Metayahu Denge	55	31
	Jigoeno Lancho	50	40
Mareko	Gota Metafino	50	27
	Kuno Alamahu	55	52
	Total	395	273

An attempt is made to minimise question non-response as much as possible. Although the supervisor checked each finished questionnaire on the spot, unfortunately some unanswered questions slipped through. Furthermore, with a few questions asked, such as detailed production data for the last three years, some degree of non-response appeared to be inevitable. While some did not remember the data, others especially the richer ones, were hesitant in providing their information, since production levels are directly related to income.

4.3.5 Sampling other stakeholders

The other informants to this research are selected based upon their relevance within the chain. The markets (Dalocha, Alaba, Butajira, Enseno, Mercato), traders (local, regional, national), wholesalers (Mercato, Butajira) and exporters (Addis Ababa) have been selected by using non-random sampling techniques. The traders have been found by walking through markets and local towns. One commercial paprika grower was found by coincidence at a Dutch embassy gathering. Spice Exporting companies were found on http://www.ethiomarket.com/products.htm. From this list 10 exporters were randomly selected and contacted by phone.

4.4 Methodological considerations – limitations

This research includes a significant sample size, makes use of a wide variety of informants, and applied several research techniques. Nevertheless, some limitations to the approach are inevitable.

In scientific research one hopes that the research question determines the methods applied. Although this norm is taken as a goal, practical constraints such as a limited budget, a stringent time constraint (three months), inefficient mode of transport, force some necessary sacrifices. One of these sacrifices is the relatively concentrated geographical area selected. Ideally, the area would have been more dispersed throughout Ethiopia or otherwise more dispersed throughout the region by selecting more kebeles, with less farmers. However, this was logistically to hard to manage, the list of the Ministry of Finance is only obtainable in the spe-

cific kebele. Secondly, to reap the full benefits from a q-squared method, one should allow sufficient time for contemplation between the different stages. This appeared not to be realistic within such a short time limit.

Not only practical considerations determined the outlook of the methodology employed. In general, data from Ethiopian institutions is aggregated more then would be ideal, and the data is most of the time insufficient and often shows inconsistencies. Due to these constraints, some research decisions made at the beginning of this study might have missed other potential areas that would have shifted the research focus. Nonetheless, it is thought that most areas with high production potential show similar results. Hence, this limitation is only of marginal importance.

Another limitation to the research is the lack of small-scale farmers that produce paprika capsicum. Initial scoping interviews revealed that small-scale farmers in the selected region would be cultivating paprika, while this appeared not to be the case. It is chosen to keep paprika as a product within the realm of the study since it is of significant importance to the Ethiopian Spice Extraction Factory. Finally, the questionnaire did not include questions that would provide insight in the amount of land allocated to specific crops and their earnings. This is done consciously so not to overburden the farmer, but it is recognised that the results would have been interesting and insightful.

4.4.1 Validity and reliability of the research

The employed research methods are judged with the concepts of validity and reliability. Validity issues are measured by internal validity: are there systematic errors in the research, does it measure what it is intended to measure? And external validity, can the empirical findings be generalised to other similar realities? (Hart, 2005).

The internal validity is constrained severely because of language issues. Most semi-structured interviews were conducted in the English language, although both respondent and interviewer did not have this language as their first. Although these problems could be more or less overcome, language problems between researcher, enumerator, and respondent were more apparent. Most of these problems were anticipated and dealt with extensively prior to the interviews. Some problems could even be solved on the spot, but despite tremendous effort from all sides, miscommunication still occurred and inescapably affected the validity of the research.

The external validity is about the scientific possibility to generalise the findings. An important question that need to be asked is: "are the circumstances in the research area unique?"(Hart, 2005). On the one hand, the research area, in comparison to other Ethiopian locations is relatively productive (lies in the green Rift Valley), has a close proximity to Addis Ababa, is located relatively near major transportation roads, but on the other hand, the area has around the same percentage of rural-urban population, and most farmers have the same average land size as in other areas. This suggest that it is likely to find a similar societal arrangement in other areas and the positive features of the study area (in the Rift Valley, near Addis Ababa) are only suggesting that in less positive areas things might even be worse. Furthermore, constraints identified by the farmers are in consensus with other literature on farmers constraints. This suggest that generalisations to other areas is justifiable.

The reliability of the research is about identifying unsystematic errors (Hart, 2005). It questions if a second measurement would lead to the same results. Especially, the questionnaire conducted by the enumerators should be under scrutiny here. Other enumerators might use different interview techniques, and respondents could give different answers to other enumerators. Furthermore, the response rate is around 69% which suggest that the sample can

be considered as random. To improve the reliability of the research, the q-squared method and triangulation is applied.

Another issue concerning validity and reliability of the research, is the cultural distance between researcher and respondent. In addition, there are countless biases or irregularities that can result from differences in gender, age, race, sexuality, religious beliefs, political affiliation, and educational level. Desai (2006), asks researchers to reflect upon their own positionality within the research. The fact that I am white, male, and young will have had an effect on the results. For example, farmers that associated me with NGOs and expected me to bring goods and money for them, likely provided different answers. To address this issue each farmer was given, before the questionnaire was conducted, a short introduction on the purpose and the limitations of the research (Desai et al., 2006).

4.5 An introduction to the quantitative approach

As shown in the literature review, farmer typologies serve to group farmers in multiple ways (e.g., commercialisation and innovation). This research wants to understand farmer typologies within agricultural value chain by identifying variables that have a significant influence on success measured in terms of being able to produce higher than average yield in three consecutive years.

But before providing the set of variables, it is interesting to list the results of (Mussema, 2006) which performed a two-stage Heckmann model in the same region, on the same crop, pepper. The dependent variable used by Mussema was the amount of product sold at the market for a single year. The final results of the model showed that 4 out of 15 variables turned out to be significant. These were, production of pepper, non-farming income, extension contact, livestock and inverse Mill's Ratio[31]. Production of pepper appeared to be positively related, since red pepper is a cash crop and non-farm income and livestock were negatively related because farmers tend to rely more on their respectively non-agricultural and higher income generating resources. Finally extension advice turned out to be positively related to farmers output[32].

The main distinction between this research and Mussema's regression analysis is the concept of consecutive years. It is important to see if the same variables still hold when externalities (such as the amount of rain) are more or less averaged out (to be discussed in 4.5). The model used to test the multiple hypothesises is a multiple regression analysis. Regression analysis provides a tool to assess those variables that are important in explaining the dependent variable. In other words variables that help to explain conditions of farmers that are relevant for success. The test results are presented in chapter 6 (Small-scale farmer in pepper).

4.5.1 The dependent variable
As previously explained, a multiple regression analysis helps to expose those regressors that significantly influence the dependent variable. This study is thought to be important because measuring success in consecutive years is highly relevant within value chain analysis, and secondly, the measurement allows comparison with the findings of Mussema's study, and it furthermore contributes to the debate on farmer commercialisation.

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[31] The inverse Mill's Ratio is adopted in the model to compensate the unexplained R square.

[32] A deeper analysis showed that the variable extension agent advise was heavily correlated with zone. Therefore it is chosen to exclude it from the model. It appeared to be insignificant.

Within agricultural value chains only a few characteristics of a supplier appear to play a role in a downstream actors' decision to do business. Roukens (2005) conducted an interview with Mr. C. Sieckmeijer, CEO of FlaVOdor, in which he asked to the most important characteristics of suppliers. Trustworthiness, high quality product, attractive price and constant supply were mentioned as being the necessary fundamental characteristics of suppliers (Roukens, 2005). Hence, this research wants to pay attention to constant supply by measuring farmer characteristics that influence it.

A constant supply is even more important within agricultural value chains. In most African countries agricultural output is significantly dependent upon the weather. Weather conditions are changing yearly and rainfall is scattered unevenly throughout villages and within villages. Measuring output of a single year does not phase out 'luck' a farmer might have had that year due to positive rainfall. Therefore, a sound model that aims to explain characteristics influencing output, should be separate from these types of externalities (such as good weather). Using several years as a yardstick helps to phase out weather conditions, since it is thought to be less likely for an individual farmer to receive good weather in three consecutive years.

The assumption is made that by making weather as much as possible an externality those variables that influence farmers behaviour, besides weather, will come to the fore. A point of critique to this approach might be that weather conditions would be fairly equal to all farmers in the region, but this appears not to be the case. Rain can fall in one village and not in the other, and sometimes it might even fall on one side of a village and not in the other. Thus, crop yield over several years is thought to negate the effects of good weather as much as possible[33].

The dependent variable is composed as follows. A single farmers total yield is divided by the land he allocated to pepper[34]. This variable is converted into a z-score[35]. These steps are done for all three years. Than all three years are summed up, which gives the final dependent variable.

4.5.2 The independent variables

The model will take the following variables into account: *the age of the respondent, the distance to the market, the non-pepper income, credit, total farm size, input use, education, other work, and the zone.* Variables such as household size, farm system, extension agent advice did not match the necessary criteria to be included in the model. Each of the previous variables will be discussed based upon its presumed causal relation with the dependent variable (Vocht, 2008).

The age of the respondent (Ratio):
This variable is measured in years and refers to the household head who is assumed to be responsible for farm management. The effect of age on production levels is twofold. The first hypothesis expects to find a negative relation between age and output. The younger a farmer is the more likelier he or she is to be fit, what makes it possible to work harder (pepper is a very labour intensive crop). Thus a negative relation between age and output is expected. Secondly, a common phrase is that wisdom goes hand in hand with age. The hypothesis in this case would expect that older farmers are more experienced and hence are capable to make

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[33] Obviously, it would be preferable to have exact climatic data for each research subject but this method will be too costly, in terms of time and money, at least for most researchers.

[34] The first step, A single farmers total yield is divided by the land he allocated to pepper, is done to correct for farm size.

[35] The second step, This variable is converted into a z-score, allows to compare the different years.

the right decisions in the different stages of production. In this case age will relate positively to pepper output.

The distance to the market (Ratio):
This variable is measured in minutes and refers to distance of a farmer's house to the market where he or she sells the product. The hypothesis follows again twofold logic. Farmers that live close to the market are more likely to obtain inputs, have less problems with transport, and have easier access for extension services. This is thought to allow them to increase their pepper output. Farmers that live far from the main market, are more distanced from business relations which could hamper them in pepper production. Thus in this case a negative relation between distance and output is expected. However, farmers that live further away from the main market are likely to have larger farms (less population density), which could help them to produce extra output, benefiting from economies of scale. In this case a positive relation between distance to market and output is expected.

The non-pepper income (Ratio):
This independent variable refers to the total amount of income measured in Birr that is earned from agricultural related activities as well as non-agricultural activities. The hypothesis for this variable is twofold. When a farmer produces other cash income generating crops, or earns money from non-agricultural related activities, the financial position of farmers improve, which allows them to obtain inputs, such as labour and chemicals, and enables them to invest in their farm practise. A study of Kevane (1995) showed that wealthy farmers use more labour per hectare and therefore have higher levels of output. Thus a positive relation between non-pepper income and higher output is expected to be found. A second hypothesis refers to the idea that farmers who earn more money from other income generating activities than pepper are likely to put less emphasise on pepper production. In this case a negative relation between non-pepper income and pepper output is expected.

Received credit (Dummy):
This is a dummy variable which takes a value 1 if the farmer obtained credit from a microfinance institution, family member, etc, or it takes a value 0 if no credit was received. Access to credit helps farmers in obtaining sufficient amount of inputs that help to increase output. The hypothesis expects to find a positive relation between farmers that receive credit and their pepper output. Thus for those farmers who lack access to credit a negative relation between credit and output is expected.

Total farm size (Ratio):
This variable refers to the total area of farmland that a farmer owns in hectare. The hypothesis of this independent variable follows the logic of economies of scale. When a farmer has more land, input costs will get relatively lower through hired labour, bulk purchased inputs, mechanization, etc., which will have a positive effect on output (the dependent variable is corrected for size, by dividing output per land unit).

Input use (Dummy):
This variable is composed of the following inputs: insecticide, pesticide, herbicide, fungicide, and seed chemicals. If a farmer uses more than two of these inputs a 1 is given, if less a 0. Most studies acknowledge the importance of inputs during cultivation. The hypothesis is that when farmers have access to multiple inputs it is likely to have a positive influence on output.

Education (Dummy):
The educational variable is used as a dummy. The value 0 is given to those farmers that did not enjoy any kind of formal education, and the value 1 is given to those that have at least primary school or higher. The hypothesis expects to find a positive relation between education and output. If a farmer has enjoyed formal schooling he or she will be more likely to apply scientific farm management. Thus higher education leads to a positive relation with the amount of pepper produced.

Other work (Dummy):
This variable measures if a farmer has non-agricultural paid work. The hypothesis expects to find a negative relation between non-agricultural work and pepper output. Leavy & Poultion (2007) warned policy makers that caution is needed if seeking to increase the market orientation of the agricultural production of households whose comparative advantage lies in non-farm employment (Leavy & Poulton, 2007). Thus for those farmers that do have other work activities besides farming it is expected to correlate negatively with pepper output.

The zone (Dummy):
Red pepper production in Ethiopia is heavily dependent upon natural influences. It is therefore thought that the area in which a farmer resides will have either a positive or a negative influence on output over the last three years. This is a dummy variable taking a value 1 if the district in which the farmer resides is Gurage, and 0 for Silte.

4.6 General hypothesis

Many studies found that farmers are confronted with constraints such as lack of fertilizer, lack of finance and others. Although this study will address these type of constraints, it further aims to deepen the understanding of the difference between farmers that produce a product for exports and those that produce for the domestic market. It is thought that chain configuration, governance type and upgrading possibilities are all related and dependent upon the final market, domestic or export. The hypothesis that captures this thought is as follows:

"It is anticipated that small-scale farmers, who are mainly producing for the domestic market are positioned in a market governance structure, and farmers who are producing for the international market are part of a vertically integrated structure. In the vertically integrated structure upgrading is more likely to be driven by an internal stakeholder, while the market governance structure needs facilitation from an external stakeholder. The farmers producing red pepper and paprika can be divided into successful and unsuccessful farmers of which the first derive more benefits from upgrading."

4.7 Conceptual model

The conceptual model displays a visualisation of the main hypothesis and research questions.

FIGURE 4.2
Conceptual model

RED PEPPER AND PAPRIKA IN ETHIOPIA

DOMESTIC MARKET — **EXPORT MARKET**

QUANTITY ← CONSTRAINTS → QUALITY

ARMS LENGTH MARKET ← GOVERNANCE → VERTICALLY INTEGRATED

LESS POSSIBILITIES ← UPGRADING → MORE POSSIBILITIES

TYPE OF SMALL SCALE FARMER — TECHNICAL/ EFFICIENCY AND EQUITY
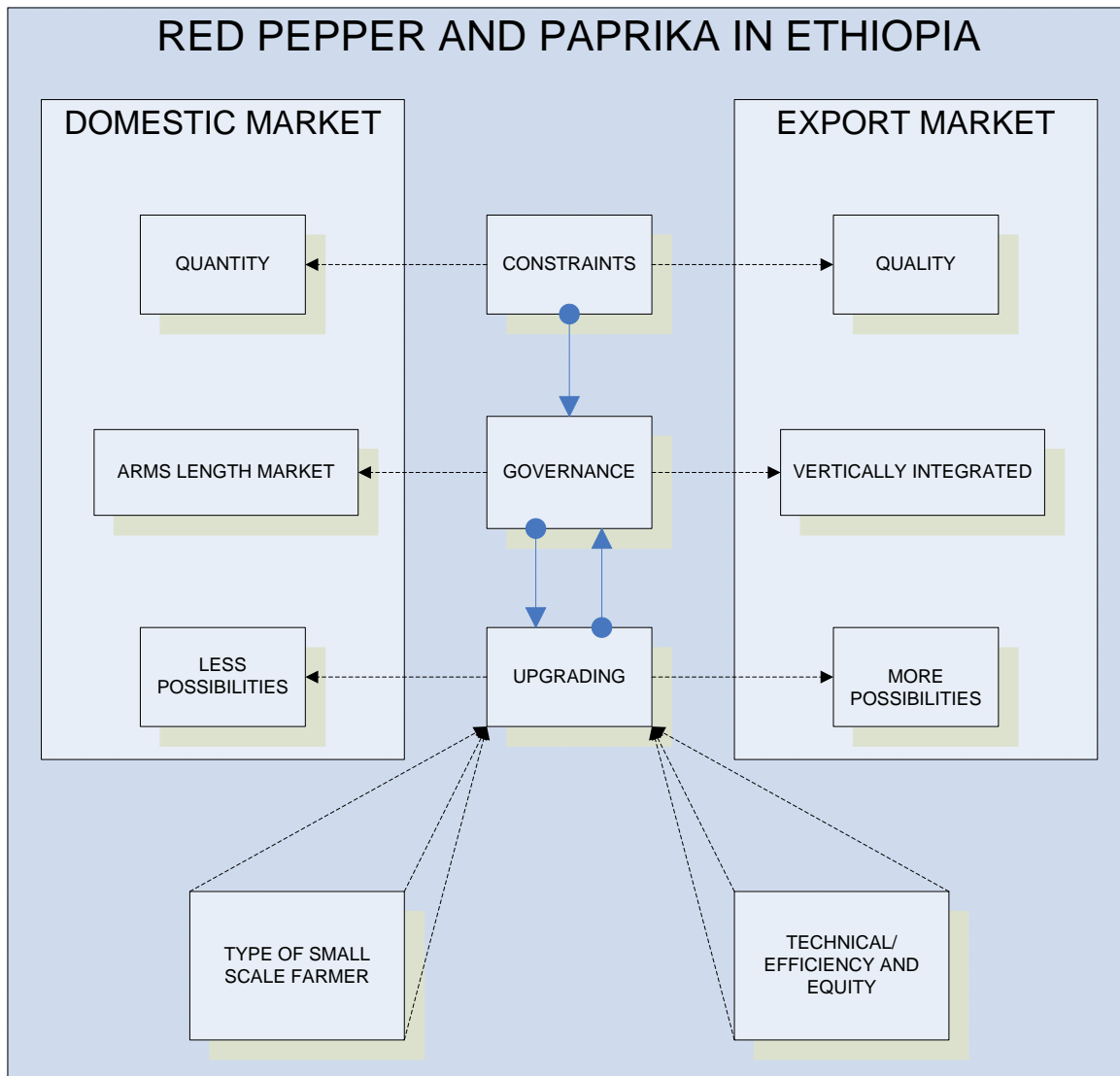
Two trajectories for red pepper/paprika emerge from the conceptual model. The trajectory of farmers that produce for the domestic market is shown on the left side of the model, and the trajectory for farmers that produce for the international market on the right side. Constraints are expected to be quite similar in both chains, although it is expected that quantity in the domestic market and quality in the export chain play a larger role. This idea is due to the absence of a formal grade system for the domestic market, and the presence of such a system for the international market.

The next step in the conceptual model focuses on the type of governance. In the domestic chain the type of governance is likely to represent an arms length market (Gereffi et al., 2005), while in the international chain a more vertically integrated structure is thought to be found. The concept of Gereffi et al., (2005) and the transaction cost approach will be used as analytical tools to assess the type of governance. Keane (2008) pointed out that governance and upgrading are mutually influential. The type of governance has a direct impact on upgrading possibilities, and a recently upgraded chain is most likely to need a new form of governance (Keane, 2008). This idea is captured in the conceptual model in that the domestic chain

is likely to have fewer possibilities for upgrading, in contrast to the export chain, which has multiple possibilities. Finally, upgrading strategies are not outside of power structures. Strategies will target specific goals (efficiency and equity), and benefit different types of farmers (Laven, 2010). These issues will be discussed in chapter: 7 Upgrading framework.

4.7.1 Operationalisation

Within the conceptual model several terms are used. This section shortly address each term and will refer to the location where an extensive description is given[36].

Red pepper and paprika capsicum
Red pepper and paprika capsicum are both members of the Solanaceae family. Red pepper is exported in a grounded form, as a spice mixture (berbere) and in an extracted form as capsicum and paprika oleoresin. Paprika capsicum is a substitute for red pepper in terms of oleoresin extraction (higher colour unit). It has very little demand at the local market. In the regional framework (chapter 2) more can be read about the specificities of both products.

Constraints
The stakeholders of the Ethiopian pepper and paprika chain are asked about their major constraints in dealing with red pepper. This study has not made an inventory of all type of constraints, special emphasise is put on those constraints with a direct link to value chains, such as throughput, quantity and quality. In chapter 5 and 6 the results of the sub-question related to constraints is given.

Governance
The literature review has extensively discussed different types of governance. Gereffi et al., (2005) has given a five type typology (market, modular, relational, captive, and hierarchy) and the transaction cost approach has given three variables (frequency, uncertainty, and asset specificity) to assess the empirically found structure. This study makes a distinction between chain governance and individual governance. The former governance type is applicable to the entire chain, while the latter is focusing on a single strand of the chain. The governance structure is explained in chapter 5: chain configuration and governance.

Upgrading (Efficiency and Equity)
An important component of value chain research is upgrading. In general, this concept refers to improving a value chain, a cluster of firms, or an individual firm. Some scholars apply the concept to the level of a nation-state. The literature review has given several forms of upgrading. This study links the concepts of efficiency and equity to upgrading with the aim to show that upgrading strategies have heterogeneous outcomes to different groups. The final chapter will deal with upgrading in terms of efficiency and equity in more detail (chapter 7: Upgrading framework).

Small-scale farmer
Within the literature review attention is paid to several classifications of suppliers. This study contributes to existing literature on typologies by running a multiple regression analysis in chapter 6. Furthermore, the relevance of using different types of farmers is coming to the fore in the final chapter on upgrading.

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[36] The term stakeholder and actor can be used interchangeably.

4.8 Summary and conclusion

The chapter on methodology has been quite extensive. The first part dealt with methodological issues. Despite the pitfalls, it is thought that the research results provide an important addition to the existing literature. Part 2 proposed different hypotheses on the direction of influence between independent variables and farmers output in three consecutive years. The last part of this chapter presented an overall conceptual representation of the research.

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5. CONFIGURATION and GOVERNANCE

The first step of value chain analysis is the *mapping of the value chain*. Two questions need to be asked: "who are the stakeholders that drive the chain?", and "at what parts of the chain is the product transformed (where is value added)?" The mapping technique overlaps with Gereffi's (1994) input-output structure and geographical coverage. It determines where the main stakeholders are to be found and in what way the product has gained in value.

Gibbon (2008) states: *"supply chains do not make up homogenous entities, in fact they are made up of several separate 'strands' which have different governance structures"*. In the conceptual model shown in chapter 4, it was made apparent that two types of chains were expected to be found, a domestic chain (section 5.1) and a chain oriented towards exports (5.2). At the same time attention is paid to individual stakeholders. Porter (1990) emphasized the importance of understanding the functioning of the black box, the single firm. GVC analysis has drawn upon this theory and instead of merely focusing on inter-actor issues, constraints of individual stakeholders also are taken into account. In section 5.3 emphasis is given to the institutional framework, based upon the third dimension of Gereffi's (1994) framework. The last section, 5.4, pays attention to the governance structures found in the domestic and export chain.

Although the hypotheses (section 4.6) expected to find small-scale farmers producing paprika capsicum, as it turned out only commercial farmers with more than 100 ha grow this commodity. Attention will be given to this finding but the main focus within this chapter is on red pepper (see 5.4.2 for paprika capsicum chain). In summary, this chapter answers the first three sub-research questions: 1) What is the basic structure of the red pepper chain in Ethiopia?; 2) Which supply side constraints do farmers, traders, exporters, the Ethiopian Spice extraction factory, and institutional stakeholders face in producing and trading red pepper? and 3) What type of governance can be found in the domestic and international red pepper supply chain? And to what extent is the institutional environment hampering or constraining the pepper/paprika chain?

5.1 Domestic market chain

Farmers included in this study, can all be classified as small-scale pepper producing farmers. Although they can be lumped together under the same category, they may act differently in producing and selling their product. Most of them sell their product on the local market (either by bringing all the product at once, or by bringing a sample), some of them leapfrog the local market and go straight to Addis Ababa to sell their product, while others sell their product to small collectors (neighbouring farmers). These different marketing channels symbolise a variety of strands within the value chain. The specific farmers' constraints, in terms of production, investments and services, will be discussed in the next chapter. For now it is sufficient to say that due to specific constraints most farmers fail to produce high quantity, quality and fail to deliver a constant supply. This chapter focuses on farmers constraints in relation to market exchange.

The situation at the local market is more complex than one might expect at first glance. Most of the time farmers will bring their whole product (or a sample) to the local market and sell to local traders (living in the adjacent town) or to traders coming from elsewhere. Competition between local traders and non-local traders is fierce. As a result conflicts arise. More about this will be said later.

Besides transactions taking place at the local market, there is a situation in which traders are triggered, instead of waiting at the market, to move into the little villages to purchase the product. Figure (5.1) to the right shows a matrix in which four types of traders' behaviour at the local market is depicted. Each type of behaviour has a different influence on the chain and on farmers income. The observed behaviour of traders is found to be dependent on two variables: price of red pepper and the amount of supply. As can be seen in the matrix when supply and price are high traders move into the village (kebele), but if supply and price are low they opt to stay at the market[37].

FIGURE 5.1
Matrix local traders
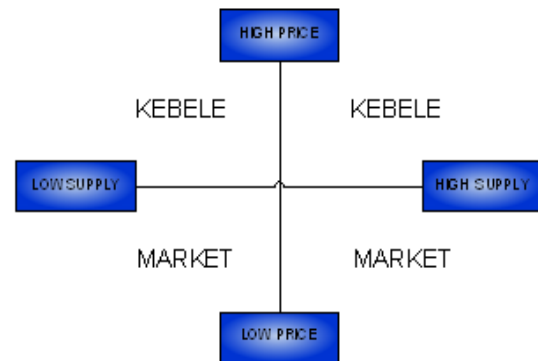
There is another reason for traders, besides the level of price and supply, to visit the farmer at the village. In some months of the year, especially during harvest, the competition at the local market is so fierce, that some traders are forced to move into the little villages.

Box 5.1: Farmers perspective on traders' behaviour

Focus group discussions with farmers reveal that the situation in which traders come to the farm site is actually preferred. First, the ratio of farmer to trader is more equal at the farm site, since traders do not bring their full entourage which is normally present at the market, and secondly, the broker who helps to smoothen the deal is more likely to be familiar or even an acquaintance of the farmer instead of being a stranger, which is most often the case at local markets. Finally, farmers do not have to transport their product, and bearing in mind that red pepper is a perishable product, this brings less damage to the product and saves in time and stress[38]. Hence, the fact that farmers are on familiar ground, makes them feel stronger and more confident during negotiation and transaction.

The fact that the place of exchange is changing according to 'natural' influences such as the amount of supply, and according to 'institutional' issues such as fierce competition, suggests that business relations between farmer and trader are weak and vulnerable. This is an issue that will be discussed into more detail in the section on governance.

Focus group discussions: A, B, and C

This study has interviewed multiple local traders and asked them about their specific constraints. First, their main concern lies with the number of traders (local and non-local) present at the market. Secondly, the product offered to them by farmers is often adulterated[39] and third, traders reported having working capital issues. The latter constraint has a huge impact

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[37] One could argue that a situation in which low supply and low price occur simultaneously is unlikely. However since Ethiopian red pepper is grown over a vast area, multiple locations are responsible for price setting. This, as a result can generate a low supply and low price in certain areas.

[38] Normally when they sell their pepper to the local market, their pepper will be damaged if it stays more than two days because it is packed, repressed and stitched with water to protect for scratch. Therefore, farmers are forced to sell at whatever the price that is set is.

[39] One of the foreign materials added is water (locally known as Kessa). Adulterants such as seeds and sand are a nuisance since it cannot be sold to the next customer (at least if one wishes to remain a trusted market player) but the practise of adding water is more problematic. It not only decreases weight when the product is dried, but more importantly it makes it impossible to store because of mold forming.

on chain configuration, since the lack of working capital prevents them from storing the product. In other words they are bound to sell the product immediately irrespective of price. Hence, local traders might be in a powerful position towards farmers, they are certainly not in the drivers seat in relation to downstream actors.

From the local market most of the product is transported to Addis Ababa. This market (Mercato) happens to be the pride of Ethiopians, since it is the biggest open-air market of Africa. At Mercato, the pepper market is dominated by several large wholesalers (Mussema, 2006). Wholesalers buy and sell huge quantities (trucks filled with around 40 quintals) to and from different parts of Ethiopia. If there is sufficient production, wholesalers prefer to buy their product straight from the farmer (large scale commercial farmers, farmer cooperatives, or informal farmer assemblies).

One of the wholesalers responded, when he was asked about the problems in the pepper business; *"to be honest there are no problems in the pepper trade"*. Several other wholesalers agreed with this statement. Three reasons are given that can clarify this somewhat surprising statement. First, wholesalers deal in red pepper that is predominantly drawn from farmers that directly sell to Addis Ababa. Those farmers deliver a reliable product, without any form of adulteration. As a result, wholesalers can store the product and sell when the price is right. Secondly, if supply tends to be low from one area it is easy to purchase from another. Although quality per region may differ, for the domestic market this is not too much of a problem. And finally, entry barriers to this occupation are high: a significant level of working capital is required to run this type of business, so with little competition wholesalers can make a good profit by buying and selling at the right time.

Besides large wholesalers at the Mercato market, there are plenty of smaller traders. These traders do not relate to the statement that there are no problems in the pepper business. Too often they have to rely on local traders who bring an adulterated product which is not suitable for storage.

Currently, wholesalers and some smaller traders are providing farmers with seeds from high quality pepper, and some to give advice to the farmer on how to cultivate the product, but still significant close relations between traders in Addis Ababa and farmer were not found. The close relation between wholesaler and large-scale farmer is based upon repetitive transactions, which has created trust between the two actors.

So far, the domestic market chain of red pepper is presented. Obviously, there are more markets like Mercato, but these have not been visited. The red pepper from Mercato is bought by local consumers, retailers and other actors.

There are however more stakeholders that take part in the red pepper chain. These are active at the domestic market and as well on the international market. They export red pepper as a pure powder, as a blend, or in an extracted (oleoresin) form. These stakeholders are the Ethiopian Spice Extraction Factory, Baltinas (retailers), and several spice exporters. In the next two sections these stakeholders, and institutional stakeholders are discussed.

5.2 Export chains

This section discusses the different sub-value chains that are found. The design of this section is similar to the one used in the previous section, except that this time the driving actor of the chain is taken as a point of departure.

5.2.1 Ethiopian Spice Extraction Factory

As has been mentioned in the introduction, the factory is no longer extracting oleoresin from red pepper or paprika capsicum. While no longer extracting oleoresin, the factory indicates that retrieving paprika oleoresin is still considered to be their core business. Around 2004, the annual demand for raw materials by the Ethiopian Spice Extraction Company (ESEF) was estimated at 40-45,000 quintals per annum, by then the factory operated with 20-25,000 quintals per year which makes up a significant amount of the domestic market supply (Aklilu, n.d.). Five years ago their sub-value chain was constructed as follows:

> **Box 5.2: ESEF supply chain**
>
> *"At the time of red pepper oleoresin extraction, we had our own agronomist who identified and selected farmers that were producing up to our standards. He worked in close collaboration with multiple farmer cooperatives, gave them advice, provided them with improved seeds from our facility and helped them with post-harvest handling. At the start of the harvesting season, we would receive samples, and here at the laboratory we would scrutinize the pepper and either reject or approve it. Those farmers that did not adulterate the product, would receive a premium. Our factory has a huge store, which allowed us to store and therefore produce year round".*
>
> Interview; ESEF

Reasons for pausing oleoresin extraction lay in low supply and low quality. Furthermore, at the moment, there is a plummeting prices on the world market for oleoresin and a rising price for the raw material, pepper and paprika, at the local market. The factory has wisely adopted several survival strategies - extraction of other spices, production of berbere for local government institutions - to keep the factory running. The ESEF is about to either start their own farm facility or to set up contract farming schemes to continue paprika oleoresin extraction. Thus, the factory is still confronted with the same constraints that were present five years ago: low production, low quality, irregular supply and high prices (Roukens, 2005). According to the factory these constraints are due to low yield, improper storage by farmers, and plant diseases. As a result an unstable and fluctuating price emerge. Box 5.3 discusses the issue of price in more detail.

Box 5.3: Price fluctuation

This box gives an indication of the extent of the price fluctuation. Obviously not only the factory is hampered in its activities due to the fluctuating price. Traders at Mercato mentioned that during low production years they have to resort to importing red pepper from India or China. Although this research did not focus on the causes of these price changes, it did come across some explanations. It clearly has to do with the irregularity of supply (the product is seasonal and constraint by climatic conditions), and the fact that farmers and traders alike can store the product for more than a year which makes forecasting a hard task, and finally, that the country has seen major inflation under different inflationary policies. To show the extent of the price fluctuation, CSA data is examined for the last three years for the markets that have been focused on in this study. The following table shows the results.

TABLE 5.1
Price fluctuation local markets (Price levels 2007/08; 2008/09; 2009/10)

PRICE LEVEL		MARKETS			
		Welkite	Butajira	Hosahna	Alaba
1999 (E.C)	Low	10.00	11.00	12.00	9.00
	High	45.00	45.00	40.67	50.00
	Average	14.46	13.29	14.97	15.13
2000 (E.C)	Low	20.67	32.00	31.67	28.00
	High	44.67	45.00	59.00	42.00
	Average	36.42	34.69	38.22	32.31
2001 (E.C)	Low	15.00	13.33	16.33	10.00
	High	22.00*	24.31	25.96	18.00*
	Average	28.78	26.97	31.81	26.47

Source: CSA, Annual Average Retail Price of Goods and Services by region and Selected Market Places. Price in birr per kilogram. (* missing data in most of the months).

As can be seen prices fluctuate heavily throughout the year and between the consecutive years. The price fluctuation can even build up in some years to a stunning 500% difference. When international market prices and the domestic prices are not synchronised, managing an export company becomes a difficult task, especially when local prices tend to be higher than international prices.

5.2.2 Baltinas and exporters

Most spice exporters are currently not exporting red pepper. This is due to the same constraints that hamper the factory in exporting (low production, low quality, irregular supply and high prices). Accordingly, their core business has shifted to other products. Baltinas (spice mix producers) do however still export some of their product in pure form as well as the spice blend berbere. To maintain their export channel one of these companies built their own infrastructure:

> Box 5.4: A Baltina's supply chain
>
> "*We have organized our supply chain in such a way, that we can trace back the product to the individual farmer. Local collectors, with whom we have very close contact, select farmers based upon their performance – high quality and quantity –. They supply the high potential farmers with proper seeds and make sure that these farmers control their farm practise and their post-harvest handling according to our given standards. Hence, they keep records of all selected farmers, and by doing so, they are able to provide quality pepper to us. Before purchase we would test the pepper on quality characteristics such as moisture, and other hygienic conditions.*
>
> Interview: Representative of a Baltina in Addis Ababa

Hence, it seems that with a managed supply chain Baltinas can keep on exporting even in difficult times. However, Baltinas' export volumes are lower due to the same constraints as mentioned by the ESEF. In addition, Baltinas faces two more constraints: First, they are no longer able to distribute improved seeds to the majority of their producers because of high import taxes. Nowadays only a selected few have access to these seeds. Secondly, most Ethiopians who travel abroad bring with them berbere to their family and friends. This informal flow of berbere to the diaspora is diminishing Baltinas potential income.

5.3 Institutional stakeholders

Another often omitted but very important component of a value chain is the institutional setting. A value chain is not an entity that is fixed, it is a theoretical construct that can be observed within a larger whole, and should not be seen detached from this whole. Institutional players that have an influence on agricultural chains are the agricultural branch of the government, agricultural research centres, and non-governmental organisations (Laven, 2010).

5.3.1 Government

The Ethiopian agricultural government body is represented at all administrative levels within Ethiopia. Of concern here are the agricultural bureaus at wereda, and kebele level. At the wereda level, there are several different agricultural bureaus (production, and wereda cooperative sector) that are working to reach small-scale farmer improvements. Wereda officials work in close collaboration with agricultural extension workers from the kebele.

The governmental body concerned with agricultural production is managing all problems related to agricultural production, including red peppers. According to wereda officials, major problems are outdated management techniques, appliance of old varieties, build-up of plant diseases, and insufficient motivation from the side of the farmer.

Officials concerned with marketing of agricultural products are providing market information, organising and giving trainings and raising awareness on the functioning and purpose of farmer cooperatives. According to them, the major problem is the small amount of farmer cooperatives that work with red pepper (just two out of 65 farmer cooperatives are active in red pepper production). Reasons behind this low participation are to be found in the fact that the concept of farmer cooperatives is relatively new (not more than 10 years old), farmers prefer to deal with this crop on an individual basis, and most farmers do not have a good perception of cooperatives because of their negative experience with production cooperatives from the previous regime (see next chapter 6.2.4 for a more detailed description of farmer cooperatives).

Most visible to the farmer are the kebele agricultural extension workers[40]. Each kebele has three extension workers, each specialised in their own division: husbandry, livestock and plant science. Although this research did not specifically focus upon their activities, the agents play an important role in educating the farmers on the use of contemporary management techniques. They assist in formulating crop rotation plans, facilitate farmers in obtaining credit at banks, and help in the post-harvest stage. According to the agricultural extension workers plant diseases, bad farm management, and lack of financial capital are the main problems of the farmers in the region.

5.3.2 Melkassa Research Centre

The Melkassa Research Centre, located in Nazareth, is actively involved in research and development related to a wide variety of crops, of which red pepper is one. According to the red pepper specialists, plant disease is the major impediment to a stable supply of red pepper. They do however mention explicitly that most of these plant diseases are easily preventable, if only different kind of management techniques were applied. Many problems start at the seedbed, when farmers use water ineffectively, sow disease infected seeds, or do not use preventive chemicals.

Furthermore, the variety farmers use is old - introduced a few decades ago - and its yield is low in comparison to international varieties. Farmers are completely reliant on climatic conditions – irrigation is very rare – which is another cause of low production. Melkassa is currently working hard to introduce a new variety which is supposed to give a higher yield, is disease resistant, and is more adapted to consumer preferences. They comment that seed distribution should not be their responsibility but instead should be done by private entrepreneurs.

Several NGOs are working on the product. One of them, SOS Sahel is discussed in 7.2.4. On the following page the chain is presented in its full complexity (domestic and international).

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[40] The major constraint faced by kebele agricultural extension workers is the size of the population they have to assist. An average village consists of around 1000 households. It is up to three development agents to assist these farmers in their farming practise. Obviously, the development agents do not have the means to assist all farmers. Therefore a system with model farmers is established. Each model farmers has to be attended at least once a week according to the protocol. Although this is in theory possible, long distances have to be travelled, circumstance are dire, and pay is insufficient to motivate the extension workers.

FIGURE 5.2
Ethiopian supply chain of red pepper
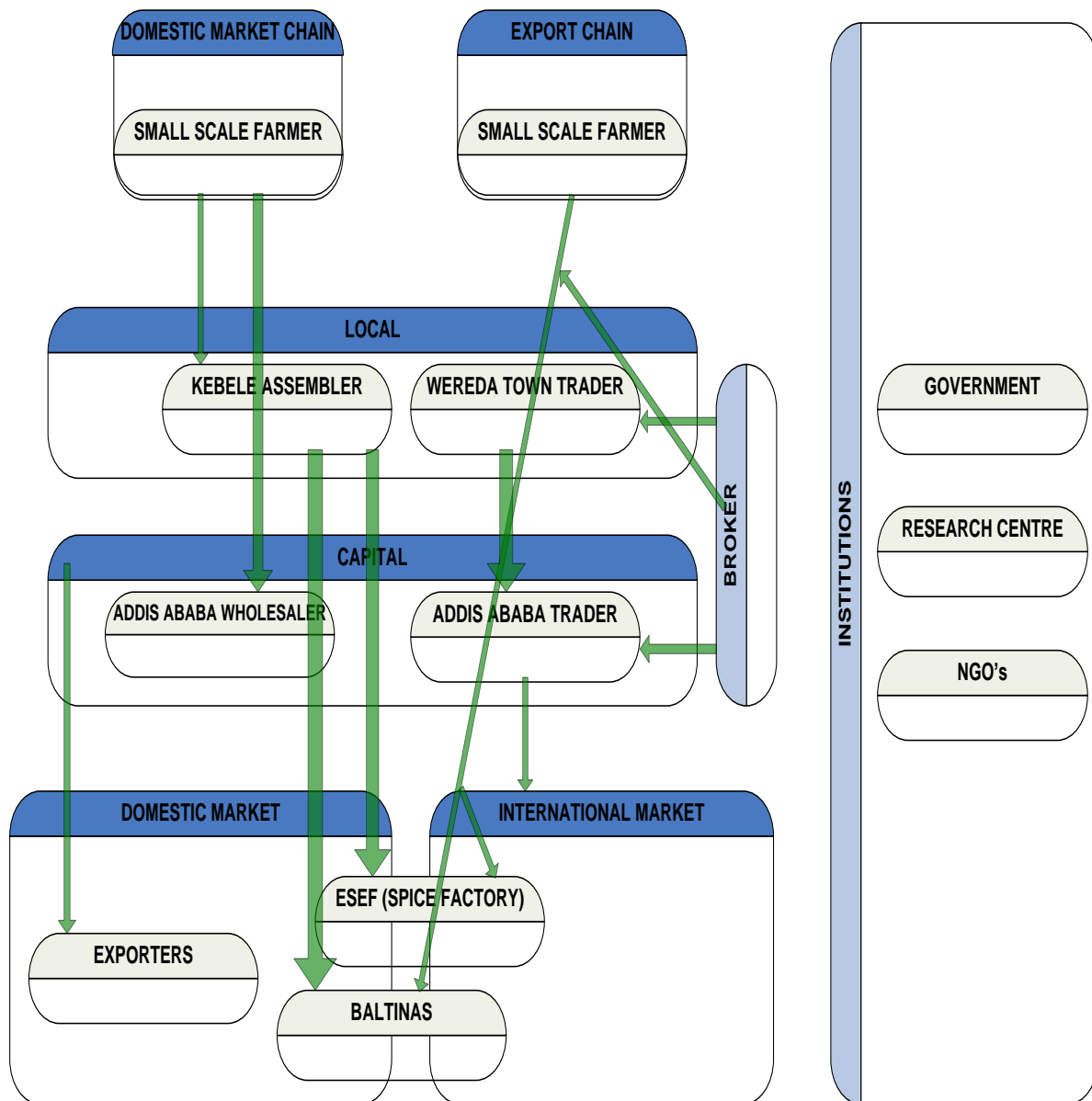
Figure 5.2 is obviously a simplification of the complexity found. It starts with two types of producers, one that supplies the domestic market, and another supplies the international market. One aspect that jumps out is that farmers who supply the international market leapfrog the entire supply chain and deal directly with the capital or the ESEF (a collector in service of the buyer might be in between). On the other hand, pepper destined for the domestic market changes ownership many times before it reaches its final destination.

5.4 Governance: domestic and export chain

In chapter 3 (theoretical framework) the concept of governance is discussed at length. Governance as 'driving' referred to the concept that supply chains are managed by buyers or producers. The findings show clearly that the export chain is driven by buyers. This conclusion is given by the fact that raw material production is labour intensive and entry barriers for new producers are low. Furthermore, downstream actors set the standards and control competition by raising the entry barriers for market information and product characteristics. The domestic chain, on the other hand, appears to nor producer or buyer driven. Due attention to this finding will be given in section 5.4.1.

This chapter is mostly concerned with the concept of governance as 'coordination'. It is important to note that value chains can be classified in a typology of five different types of governance: Market, modular, relational, captive and hierarchical. To assess which type of coordination fits most, elements of New Institutional Economics (transactions costs, institutions, and social capital) will be used. These concepts help to focus on the type of transaction, the underlying explanatory mechanisms and the relation it has with governance. This chapter starts by discussing the type of governance within the domestic chain and continues by giving the governance types of two export chains[41].

5.4.1 Domestic supply chain

It is brought to mind that the domestic supply chain is not one fixed channel. The amount of supply, the price level and the number of traders all have a direct influence on how and where transactions take place. While some farmers sell their product on the local market, others go directly to the capital, Addis Ababa. The fact that the chain's configuration is changing according to 'natural' circumstances is a strong indication that the domestic supply chain is a 'market' chain according to the typology of Gereffi (2005). But before anchoring the governance type, it is wise to analyse the exchange and the relations between farmers and traders.

In value chain analysis it is common to analyse those points in which value is added to a commodity. The most significant value addition takes place at the local market, when the product is exchanged between farmer and trader. By means of observation and interviews some empirical findings regarding the exchange are given below.

By means of the transaction cost approach the exchange at the local market is analysed. The approach is composed of three variables: frequency, uncertainty and asset specificity. First, frequency; the number of times farmers and traders meet to exchange products. The fully structured questionnaire shows that 70% of all farmers sell their harvest in one batch, and only 30% sells their product in multiple batches. Furthermore, most farmers sell their product to different buyers each time. This indicates that the number of times buyers and sellers meet is very low.

The next variable derived from the transaction approach is 'uncertainty'. This variable is used to measure the amount of uncertainty that springs off from the transaction. Normally, the variable is only used from the perspective of the buyer. In this study the transaction is however analysed from buyer and seller's perspective, since it generates meaningful insights. While, farmers bring their product voluntarily to the market, once they are there they are confronted with many decisions, rules and practices that are not working to their advantage. First, the transaction takes place by measuring the weight of the product on a scale of the buyer. Since most farmers do not own a scale nor have access to a trustworthy one, they rely completely upon the accuracy of the buyer's scale. Obviously, this allows buyers to manipulate

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[41] For those unfamiliar with farmers constraints it might be wise to read 6.1 and 6.2 first.

the scale and trick the farmers by decreasing the measured weight of the product. In relation to the previous issue, farmers have the custom to measure the weight of their product by using different types of bags (*jonia, tekka*), while traders use kilograms indicated by the scale. The discrepancy between measurements is fuelling uncertainty during the exchange. Hence, those farmers who are not aware of kilograms[42] are even more vulnerable to being tricked; only 40 % of the farmers knew the right conversion rates between their measurement and kilograms[43].

Secondly, most of the farmers in the questionnaire (70%) reported that they had to sell their product because, one, they had to pay back their loans (e.g., fertilizer and taxes) or they had to feed their family. These outstanding debts forced them to sell, and this did not allow them to wait for a better price. Furthermore, multiple farmers felt a huge pressure exerted from traders and brokers to sell their product. Brokers collaborate with traders and by using several techniques they manage to squeeze money out of the farmer[44]. Thus, with most of the transactions taking place in a state of distress[45], instead of well-considered entrepreneurial decisions, farmers participation in the market transaction is accompanied by huge uncertainty. From the perspective of the buyer, the transaction is less uncertain, but still not certain. The problem buyers face is that they do not know to what extent the product is adulterated by the farmer. If more water is added than they had anticipated upon they might lose profit.

A conclusion derived from applying the concept of uncertainty shows that traders are much less interested in forming close relations with farmers than the other way around. Farmers have much more to win from a stable environment in which the transaction takes place.

The last concept of the transaction cost approach is 'asset specificity'. This concept investigates to what extent producer utilities are merely used for one single buyer. Applying this concept to the relation between buyer and seller shows that most farmers are not dependent on one single buyer in terms of assets they use for production. All buyers more or less ask for the same product characteristics, which allows farmers to shift buyer and vice versa. Thus the transaction cost approach (see figure 3.2 in section 3.3) would predict that under these circumstances a spot market transaction is likely to take place. The findings at the local market suggest indeed that a spot market transaction is taking place, with huge consequences for the farmers.

Referring back to Gereffi's typology, an arms length market is further characterised by multiple actors (buyers and sellers), and a lack of trust between them. All markets visited show that multiple traders and farmers were present, most of them shopping around until a good deal can be made. Traders mention not to trust farmers, since most of them adulterate the product and on the other hand, farmers do not trust traders, since many of them were tricked in the past. Due to this presence of numerous buyers and sellers no stable and permanent relations seem to emerge. The concept of social capital given by Fukuyama: "*Social capital is an instantiated informal norm that promotes co-operation between two or more*

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[42] Even if farmers have knowledge about weighing, they are not allowed to check the scales (Mussema, 2006)

[43] One SD from the actual is taken into account since some farmers might put extra in one bag by pressing.

[44] Most of these scams can be classified as criminal activities. To give a few examples, traders have many ways to influence the weight on the scale (adjusting the balance, using invisible ropes to change the balance). Furthermore traders run all kind of schemes with the brokers. An example, during a long negotiation process just before a deal is closed, farmers attention is drawn by traders who pull their money out of their pocket and start counting it, at the same time, brokers take the farmers product from the scale and put all of it on the big pile, and when the farmer wants to finish the deal, his product is gone and the farmer has left no other choice than to finish the deal, which is now of course less promising for the farmer. Some farmers mentioned that police officers were informed, but apparently they could not help to set things right.

[45] Risk minimanisation, and distress sales, provide good examples of sale of crops that is not driven by a profit motive.

individuals. In the economic sphere it reduces transaction costs" shows that social capital in the research site is rather limited.

The conclusion is that all these findings show that the exchange at the market is part of a spot market transaction and takes place within a market type of governance. The changing chain configuration, infrequent transactions, the high uncertainty for farmer and relative low uncertainty for traders, the presence of many actors at the market, and the low level of social capital all suggest that this chain resembles an arms length chain. Section 5.5 pays attention to the institutional setting surrounding the market and the exchange, with the aim to provide some answers to how the arms length market has come about.

5.4.2 Export chains

Sub chain - red pepper

 "*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*" (Kaplinksy, 2000). Those chains driven by exporters and previously by the Spice Extraction Factory are clearly more directed towards coordination than the domestic chain. These downstream actors provide farmers with seeds, they give advice on how to run effective farm management, they pay premiums when a quality product is delivered, they keep records of farmers performance and with some suppliers long term formal contracts are arranged.

When looking at the typology given by Gereffi (2005) it is hard to see an immediate place for these types of chains. The variables (complexity of transactions, ability to codify transactions and capabilities in supply base) do not seem to fit in an agricultural setting. Since they focus on product specifications and machinery that is needed to make an order. The fact that the current red pepper chain does not have a domestic grade system, makes it hard to distinguish empirically between different buyers and sellers. Furthermore, specific machinery requirements are absent, which makes the three variables unusable within an agricultural sector.

Daviron (2005) found a similar situation during his fieldwork and made a distinction between on the one hand a chain targeted for the domestic market (traditional) and on the other hand for the international market (modern). This study has used the same distinction and in previous sections it became clear that social capital between buyer and seller of international chains is higher. These actors seem to trust each other stronger due to repetitive transactions. Furthermore, upstream actors, exporters and ESEF, provide the supplier with information, seeds, and specifications (free from adulteration etc.) that is an indication of stronger integration. Hence, the governance type in the export chain resembles a modern market as defined by Daviron. Using Gereffi's (2005) typology more loosely would suggest that the export chains can be classified as a relational chain. A governance type in which power is more levelled between stakeholders, but remains predominantly with the buyer.

Sub chain – paprika capsicum

The research findings indicate that small-scale farmers in the selected region do not cultivate the paprika capsicum variety. This is due to several reasons. While most farmers had never heard of the product, those that did thought it was too risky to produce. When asked if farmers were interested in producing this variety, most farmers responded that they were afraid that producing paprika would damage their red pepper production. According to them, it would

contaminate red pepper, by reducing red peppers' pungency and colour unit. In addition, paprika production would affect red pepper yield negatively. Furthermore, the domestic demand for paprika is limited to the factory, which is currently not extracting the product. Farmers who managed to produce paprika in the past, have since realised that dependence on one single buyer is too risky, and this makes them reluctant to start producing paprika again.

The Melkassa research centre is currently providing paprika capsicum seeds to large scale commercial farmers. The federal government is supporting this practise and is investing in several regions, among which Amhara region. The federal government is advocating that foreign investors cultivate the crop. One of these foreign investors owns a huge farm (600+ ha) and sells the dried raw material to Spain where a huge paprika factory is extracting it[46]. The paprika chain is similar to an export chain in that there is strong integration between institutional stakeholders and producers. The governance structure between commercial farmer and factory in Spain is beyond the scope of this research.

5.5 Discussion on governance types and upgrading

In this section explicit attention will be given to the institutional setting in which the domestic supply chain is embedded. The following questions are asked: 1) which factors determine that an on spot market transaction takes place and 2) who is responsible for implementing upgrading strategies? But first some general conclusions are made between governance types and single strands within the domestic chain.

Governance

The main findings of the domestic market chain do not seem to resemble the criteria mentioned in the definition given by Kaplinsky (2000). The exchange of information between buyer and seller at the local market is very slim. Farmers do not receive a description which states what quality to produce and what quantity. Although, some actors do exchange information this is not institutionalised and should be seen as an act of informal governance. A second element of Kaplinksly's definition is cooperation. The first section of this chapter showed that traders, when confronted with less supply, adjust their strategy by moving further upstream or shift their business to other products. As a result, ties between stakeholders are very loose. Actors' behaviour is dependent upon forces beyond human control. The wholesalers seem to operate in a somewhat more tightly organised value chain. They exchange information with producers, however information exchange is limited to advice and occasionally product specifications.

As a conclusion it can be said that, when reviewing the domestic market chain as a whole, there is no formal governance structure present. There is no, single firm that determines product qualifications, lead times, or other value chain related demands. The findings show that some individual actors (buyer and seller) do have closer relations with each other based upon repetitive transactions. Thus, while no formal governance structure seems to be there, informal governance types are present.

However, an interesting angle from which to think about governance structures in an agricultural value chain would be Gibbon's (2001) classification of traders that govern the chain. A chain dominated by traders have the same characteristics as found in the pepper chain: labour intensive raw material production, a locally discontinuous supply, easy to meet entry barriers for production, a low price elasticity of demand, and high entry barriers for traders in terms of working capital. Mussema's (2006) finding that the domestic pepper mar-

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[46] No contacts have been made between the factory and foreign investors so far.

ket is an oligopoly run by traders support this. The wholesalers in Addis Ababa seem to exploit this position. The current chain configuration is even beneficial to them. The empirical findings from this study overlap with Gibbons classification. Hence, a part of the answer to the question: "which factors determine if a spot market transaction takes place?" can now be given by the fact that formal chain governance in the form of information exchange, logistical management, and advise is absent. Obviously some informal governance is present, but this does not institutionalise best practices throughout the chain.

Farmers in the study area face many constraints (see next chapter). One important strand of the domestic chain, the local market, needs further scrutiny to provide an all-encompassing answer to the question posed earlier. The transaction cost approach expects an on spot market transaction to take place when frequency is low, when the transaction has low uncertainty for the buyer and when asset specificity is low. This study acknowledges the strength of the transaction cost approach, but simultaneously sees its fallacy. The approach cannot analyse the transaction in the specific institutional setting present.

This study states that the transaction at the market is due to the presence of multiple market failures. It will analyse the market as an institution through the lens of Portes, who states that an institution is a symbolic blueprint of an organisation. Hence, attention will be paid to the rules and functioning of the market.

In the regional framework it has been said that Ethiopian markets are currently run in a free market fashion. The idea is that free and voluntarily exchange would be beneficial to both sides and to society as a whole (Gabre-Madhin, 2001). Critics state that in these free markets, failures occur. An important market failure, addressing the idea of full information from neo-classicists, is incomplete price information. While farmers in the research indeed lack full price information, the findings suggest that even if farmers would have access to information on price, traders and brokers would still be able to take excessive profits by using other scamming techniques.

A second failure at the market is the absence of formal oversight. In other words, formal rules are absent at the market, and are needed to establish a level playing field. The fact that traders can manipulate their scale and can get away with it most of the time, the fact that farmers are often pressed to sell their product, and the fact that brokers are needed to smooth the transaction all suggest that formal rules are not in place. The presence of brokers clearly underpins the absence of a proper institutional setting. Although it is not the purpose of this study to portray brokers as villains - they help smooth transactions and assist traders in their search for red pepper in the rural area - the purpose is to expose why brokers are needed in the first place. According to all actors involved at the local market, this is due to trust issues. Trust between farmers and traders is very poor, as indicated earlier. This social vacuum creates plenty of uncertainty for brokers to exploit. The lack of trust between farmer and trader can be seen as an issue between individuals, but is more likely related to institutions that construct the 'market' at which the transaction takes place (Hodgson, 2006). Therefore, trust should not be seen as a cause but as a consequence. The market place lacks institutional oversight of which issues around trust are a result.

Hence, the absence of a formal governance structure, and the absence of a proper functioning institutional setting both determine the transaction take place as an spot market transaction. Because of this, buyers and sellers do not cooperate (at least not formally), do not share information, and as a result best practises are not institutionalised.

Upgrading

The second question that arises from all this is, "who is likely to bring change?" In other words, who is responsible for upgrading? As will be clear from the next chapter, farm-

ers are not likely to initiate upgrading. They face constraints to such an extent that they do not have the means to change the situation. Nor are local traders likely to be the driving force behind upgrading since they lack the financial means to invest. Wholesalers are actually bene-fitting from the current configuration, so nothing can be expected from this group either. Hence, the fact that most stakeholders lack the means or incentives to invest, the absence of formal governance structure and the lack of a proper functioning institutional setting push forward the idea that endogenous change within the domestic supply chain is unlikely.

Therefore public action is needed. Governments should push forward an agenda to change the institutional setting of the market. Platteau (1995) warns that decentralized ar-rangements based on reputation (such as the market transaction) are not sufficient to ensure honest behaviour, so private and public-order institutions are necessary to create the social conditions necessary for markets to operate (see for example upgrading strategy 1. adjusting market failures in chapter 7).

The situation for the export chains are quite different. These chains have a formal type of governance structure, they exchange information, provide advice, etc. Therefore it is much more likely that downstream actors invest in their supplier base. Hence, it can be expected that internal upgrading occurs within the export strands of the value chain.

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6. SMALL-SCALE FARMERS IN PEPPER

This chapter starts by introducing general features of the study population, the subject of the fully structured questionnaires, the farmers. In the previous chapter farmer constraints in terms of market exchange have been discussed. In 6.2 constraints that specifically affect farmers' production capabilities are outlined. This study has identified variables that help to explain why farmers are successful or unsuccessful. This is done by means of multiple regression analysis of which the results are to be found in 6.3.

6.1 An introduction to small-scale farmers in the research area

The fully structured questionnaire held among farmers has resulted in a database consisting of 273 farmers. All these farmers currently reside in the (S.S.N.P) Region of Ethiopia. Around 70 % of the farmers are from Silte zone and 30% of them reside in Gurage zone. This section provides further detailed information about the characteristics of the farmers in the sample.

6.1.1 Demographics

Most villages include between 900 and 1000 households. In the research sample an average household has around 6 members (man and wife and 4 children). The respondents answered that, on average, just one of their children was able to help on the farm.

The research covered seven villages. The average age of the household head is around 37 years. The table to the right displays the average age of the respondents grouped per village. The database consist of 91.6 % (250) of men, and 7.0 % (19) of women. The skew in gender is due to selection of household heads, which is a post still dominated by men.

TABLE 6.1
Average age of respondents grouped per village

The kebele	Mean	N	Std. Deviation
Warisha shanka	40,06	36	12,685
Rapi	36,14	57	13,976
Abot Tirora	36,04	24	11,615
Metayahu Denge	34,13	31	7,663
Kuno Alamahu	44,38	50	14,087
Gota Metafino	33,42	26	13,729
Jigoeno Lancho	33,74	39	11,121
Total	37,37	263	13,056

Most of the women that hold the position of household head are illiterate (85%). None of them has other type of activities that generate money besides running the farm. All of them produced less than average in the three consecutive years and their total income is as well lower than average. Most of these women responded that life on the farm as household head is a hard job. They are left no other choice but to ask their children to help on the farm. Some of them feel embarrassed that their children have less access to education. Some of the women told to be lucky, since they could rely upon other family members who helped out with hard labour activities.

The educational level of all the respondents is displayed in table 6.2 below. As can be seen most farmers (150) did not receive any formal education. 110 out of these 150 did not have the ability to either read or write. Primary school was followed by 108 farmers, while only 10 attended secondary school.

TABLE 6.2
The educational level of the respondent

		The educational level of the respondent			
		None	Primary school	Secondary school	Total
The kebele	Warisha shanka	25	12	1	38
	Rapi	36	19	1	56
	Abot Tirora	4	22	2	28
	Metayahu Denge	14	15	1	30
	Kuno Alamahu	37	14	1	52
	Gota Metafino	12	13	2	27
	Jigoeno Lancho	22	13	2	37
	Total	150	108	10	268

6.1.2 Income levels

Two thirds of the respondents mention that red pepper is used for cash income and home consumption. The other third primarily produces it for cash income. The average non-pepper income and total income (pepper included) for 2001 E.C. (2009-2010 Gregorian calendar) is grouped per village and shown to the right. A glance at the table shows that the average total income level in Kuno Alamahu is staggering low (802) compared to Gota Metafino (3959).

TABLE 6.3
Average non-pepper income and total average income grouped per village (in Ethiopian Birr)

The kebele		Non-Pepper income	Total income	Percentage increase
Warisha shanka		2354	2969	26
Rapi		2361	3528	50
Abot Tirora		2472	3541	44
Metayahu Denge		1434	1799	25
Kuno Alamahu		637	802	26
Gota Metafino		3558	3959	12
Jigoeno Lancho		1193	1708	43
Total		1890	2501	32

A one way anova test shows that the hypothesis "all income means of the seven villages are equal" is to be rejected with 99% certainty. This means that the average income level per village is significantly different, and coincides with the difference between Kuno Alamahu and Gota Metafino. The difference between these two villages might be due to a sampling bias. The inhabitants of Kuno Alamahu have been selected randomly from a list, while the farmers in Gota Metafino have partly been selected by walking randomly from the town center. Another explanation for the difference could be the average farm size. Gota Metafino farmers own on average 2 hectare and Kuno Alamahu farmers only 1 hectare. The difference in farm size might be due to the fact that groundwater is available in Kuno Alamahu which makes competition over land more likely. These differences between villages are especially interesting to policy makers who have to make underpinned decisions on where to intervene.

Another look at the table shows the relevance of pepper. On average pepper contributes 32% to farmers income. While pepper is not the main source of income, farmers explained that it was the only crop that has the potential to generate a high profit. Other crops all need huge amounts of inputs which makes the profit margin lower. The enormous potential of red pepper was explained by one of the traders: "*red pepper has been the sole financier of this town. It [pepper income] has built this entire town in just 2 years when price was high*"

A last remark on income levels is that the difference in income levels between individual farmers is staggering. While some did not earn any income at all in 2001 E.C (mostly due to drought) others earned an equivalent of 6 US dollars a day. Focus group discussions revealed that farmers who did not have an income had to sell their livestock and some had to resort to informal lenders (with high interest rates) to sustain their living. None of the above *average* incomes is higher than the dollar a day threshold set by the World Bank.

An overview of the previous findings suggests that on average farmers are poor but at the same time not all farmers are poor. As will be clear in the next chapter, upgrading strategies are likely to generate different outcomes in terms of equity for different farmer groups.

6.2 Farmers constraints

Whole books are written on the constraints faced by small farm holders. Most common constraints are capital issues, lack of proper inputs, imperfect market information, poor market access. The aim of this research is not to show that farmers residing in the research area face similar constraints to mentioned above, but to address how these constraints are effecting upgrading strategies.

Nevertheless, to have a proper discussion, it is thought necessary to describe the major constraints faced by the small-scale farmers for this specific area as each research site will be different. It is chosen to discuss the main problem areas in relation to red pepper production: inputs, farming practise, post-harvest handling, and (extension) service. For those readers familiar with farmers constraints section 6.2.4 is still worthwhile to read.

6.2.1 Inputs (Improved seeds, chemical, and fertilizers)

In development studies, and more specifically in complexity theory, scholars employ the concept of *path dependency*. It explains: "*how the set of decisions one faces for any given circumstance is limited by the decisions one has made in the past*". This is especially true for inputs, such as seeds. The research data indicates that 33% of the farmers use seeds of last years yield. This practice, while not necessarily harmful, though if practiced many years in a row, degrade the variety with major implications in terms of yield and quality.

Thus the question would be how many farmers are actually purchase or receive improved seeds[47]? First, the qualitative data indicates that companies, research centres, and NGOs provide farmers with improved seeds, nonetheless only an estimated 5% or even less has practical access to these. Secondly, a more promising figure arises from the quantitative findings, which indicates that 70% of the farmers do not use the seeds from last year's production, but purchase their seeds from private-public sources. Unfortunately, this does not necessarily imply that farmers purchase improved seeds. From this 70% only 10% is actually coming from a reliable source such as an agricultural bureau or a research centre. However, the indication that 70% purchase their seeds from outside the farm suggests that farmers are willing to 'commercialise' pointing this way.

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[47] According to Melkassa, this is a seed which generate high yield, a good quality (size, pungency level and colour unit) and is disease resistant.

A second relevant input for farmers is different type of chemicals (disease preventing chemicals, insecticides, fungicides and pesticides). A new chemical, released just two years ago, should be mixed with seeds in order to make the seeds disease resistant. Research results show that only 10% of the farmers actually applied this chemical to their seeds in the year 2001 E.C (2009-2010). Why is this figure so low? Focus group discussions reveal that most farmers are reluctant to adopt new inventions or improvements at the moment of release. Preferable other farmers (more entrepreneurial types) should change their farming practise, and if it works they will go along. Secondly, some farmers explained that they first sow a very small plot with the treated seeds, and will see how it turns out[48]. The other chemicals needed for high yield are hard to come by for most farmers (43%). Nonetheless 22 % of the farmers appeared to have access to all three.

The third and last input to be discussed is fertilizers[49]. Purchase, distribution and sale is completely in the hands of the government. Weredas have their own distribution centres where farmers can purchase fertilizers[50]. Fertilizers usage is highly recommended by the government and is one of the focus points of the agricultural development strategy, PASDEP 2006-2010[51]. Each region has its own agricultural laboratory which tests soil fertility throughout their area. From these test a general advise for fertilizer usage is issued. For most areas this comes down to 200 dap (P) and 100 Urea (N) per hectare. According to Melkassa applying this uniform ratio of fertilizer is essential to avoid problems of either over-or under usage.

Most farmers in the research area do not plant a full hectare with red pepper. In Ethiopia's Southern Region one hectare equals four timad (local measurement)[52]. The amount of fertilizer kilogram[53] actually applied to one timad is given in the table to the right. The table shows that most villages do not come near to the recommended amount.

TABLE 6.4
Apllication of fertilizers (in kg)

The kebele	Dap per Timad (Kgs)	Urea per Timad (Kgs)
Metayahu Denge	23,83	19,00
Kuno Alamahu	11,61	12,18
Gota Metafino	17,67	13,00
Jigoeno Lancho	31,74	24,50
Total	23,42	18,68

According to development agents the lack of fertilizer usage is clearly a demand side issue. Warehouses are fully stacked, but apparently farmers do not purchase the products. Most farmers respond to this issue that they lack the financial means to buy the recommended amount[54].

6.2.2 Farming practice

This research is not concerned with the actual farming practice, its interest lies in the ability or inability of farmers to change this. This is thought to be highly related to upgrading possibilities. In other words are farmers by themselves capable of changing their customs?

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[48] The fact that there is a delay of one year is due to many farmers that have saved the chemicals for a year in the hope for better climatic circumstances.

[49] The question on fertilizer usage has a smaller sample size, because the first 100 conducted questionnaires on this topic appeared to be unreliable and it is chosen to completely discard these.

[50] Each village appears to have their own scheme of fertilizer purchase. Some apply a more individual approach, while others buy as a collective.

[51] Gregorian calendar.

[52] 1 hectare equals four timad. 100 Dap and 200 Urea per hectare is converted 25 kg dap and 50 kg urea per timad.

[53] The fact that some farmers are not aware of kilogram usage, made enumerators discuss this issue by means of buckets.

[54] Informal discussions indicate that a huge price inflation is cause to the inability of farmers to purchase fertilizers.

To begin with, downstream and institutional actors mention that most small-scale farmers continue to work according to traditional farming techniques: they do not apply inputs as they should, seedbeds are not prepared according to scientific standards, transplanting occurs at an inappropriate time, weeding sessions are not done properly, there is improper drainage of fields, and harvesting methods are applied inaccurately. When all of this might be true, the question is what is making these farmers do so?

Farmers report that the major cause of their inability to improve is the recurring drought. Scientific publications show that the continent of Africa is affected heavily by recent climatic changes: drought is happening more often, and rains do not fall in predictable patterns (Regassa et al., 2010). As one farmer remarked: "*rain does fall, but when it does it comes with loads and loads at a time, this does not help either for production*".

Drought in its most destructive form has the ability to destroy crops completely. Red pepper especially, which needs water desperately for sustainable growth, is severely vulnerable to moisture stress. Although 90 % of the farmers do have a small well to irrigate their small plot (for seedling production), they completely lack any form of managed water supply for their main fields. Nearby rivers and lakes do not supply sufficient water to irrigate the land for crop production. Some villages do seem to have the possibility to extract water from the ground, but this needs huge capital investments. Thus, for most farmers it is impossible to change their farming practise in such a way that drought and excessive rainfall problems can be averted, in other words, they have to rely completely upon the will of nature.

Secondly, most farmers own land with the size of on average 1 hectare. With this land size, crop rotation plans allow farmers to produce red pepper once in every three, preferably four, years on a single timad[55]. When farmers want to follow this crop rotation plan, this means that only 25% of their land can be planted with pepper to follow a sustainable crop rotation scheme[56]. However, results show that 30% of the farmers do not follow crop rotation principles as they should. The reason for this are mostly financial need. If a red pepper harvest is successful farmers benefit greatly, so they keep often try again, even if they shouldn't.

In summary, the inability to acquire improved seeds, lack of water management, lack of modern farm practise and the lack of crop rotation principles are all cause to an unstable supply of pepper. Moreover, these issues contribute to one of the major problems of the area: plant diseases. Farmers and development agents mention that most diseases cause relatively small nuisances to crop production (there are curing chemicals available), but increasingly a variation of diseases cause Adric (freely translated as: dry it) which makes the plant shrink and die, and no chemical is available thus far to treat this. Around 67% of the farmers mention that their 2001 E.C harvest has shown signs of Adric.

6.2.3 Post-harvest handling

In short, farmers dry their product mostly on the ground without proper shading materials. Storage facilities are ill constructed and 45% of farmer do not have a storage facility besides their own house. Transportation takes place in sacks, and this is damaging the red pepper. All these practises lead to quality deterioration.

One aspect of post-harvest handling is the selling process. As has been extensively discussed in the previous chapter, selling of red pepper to local traders does not seem to bene-

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[55] Crop rotation additionally prescribes that no other plants from the Solanaceae family are planted between rotations of red peppers (Motes, n.d.)

[56] The 25% is based upon the notion that farmers plant their crop annually so the whole plot cannot be used again without reducing yield.

fit farmers. To repeat briefly, many farmers are tricked, by means of weighted scales and other common scams. Brokers exploit the lack of trust between farmer and trader, or work together with the trader. These issues make the bargaining power of farmers at the local market very weak.

6.2.3 Services (extension and capital)

Farmers access to new agricultural information is mainly retrieved from one source: agricultural extension workers. As has been demonstrated in the previous chapter, development agents are ill-equipped to visit all farmers. Therefore a huge portion of farmers are excluded from this source of information and must rely primarily on other farmers who did receive information.

The last constraint discussed is the most commonly heard: access, or better put the lack of access, to capital. Results from the questionnaire show that 237 farmers out of 270 , or 86,8 %, were in need of credit. Most of these farmers responded to the question: "what would have been the purpose of the credit?" with "to pay back loans", but still an important proportion (44%) mentioned the need for working capital. An interesting question would be out of these 237 farmers, how many actually acquired the credit? As it appeared, 43 farmers (15%) had received credit.

6.2.4 Farmer cooperatives

The issue of farmer cooperatives has been touched upon in the previous chapter. Here an elaboration is given on mechanisms that help to explain the inactiveness of farmer cooperatives on red pepper. A quantitative approach on this issue would not give satisfying results. Therefore this issue has been discussed in three focus group discussions dispersed over the area, with farmers from different income and production levels included.

As has been mentioned in the last chapter, farmer cooperatives are not keen to work on red pepper because of the high risk. An explanation for the relatively few farmer cooperatives working on red pepper can be found in the recent establishment of farmer cooperatives (not longer than 10 years ago), the idea that most farmers have that cooperatives do not work in their benefit[57], and their relative unawareness of the functioning of cooperatives. In addition, farmers prefer to control the marketing of this crop themselves.

The latter finding is particularly interesting. Before market transactions take place farmers work together in many stages of the cultivation process. They transplant seedlings in a group[58], they weed their fields together, they might even help each other out during harvesting. All these activities are part of a structure run by social cooperation, locally known as *Geza.* As it appears, social capital is context specific. The marketing process apparently differs to such an extent from the production process that farmers are not willing to cooperate in this stage. The intriguing question would be: why do some farmers continue to sell the product by themselves, despite realising their low bargaining power?

First, not all farmers are working alone in the selling process. There are a few farmer cooperatives on red pepper, and most of the farmers share price information and data analysis reveals that 18% of the farmers sometimes sell by means of an informal group. However, by means of triangulation, the data reveals that cooperation on selling is still relative. Traders

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[57] During the previous regime, *Derg,* cooperatives were based on communist ideas. They were formed along the Soviet model on the principles of production. Recent cooperatives are working clearly on the marketing side. But not all farmers are so sure about that.

[58] It is important to cooperate in this because seedlings are highly perishable.

state that if farmers approach them in a group they all forced to negotiate and transact individually.

Secondly, focus group discussions indicate that farmers are reluctant to sell in a group due to trust issues. To the question: "what is needed to establish a cooperative?", farmers listed a good leader, office space, storage, and above all initial capital. To the question: "if credit was provided, would you start?", the common answer was no. The trust issues that appeared to play a significant role in weakening the relationship between farmer and trader, also apparently exist between farmer and farmer. Without outside help in form of NGOs or wereda officials, farmers are all not willing to invest in a cooperative or partnership. They do not want to rely on local individuals which would be made responsible for the difficult task of managing a cooperative. Furthermore, red pepper is the main cash crop in the region. For most farmers keeping red pepper stock is like putting savings in a bank. For most of them it is of utmost importance to be in full control of when and how to sell.

Thus, group consensus is clear on one thing. If there is no help from outside the community, cooperation is unlikely to be established. Farmers do realise that an important advantages cooperatives can bring is a stronger bargaining position in the market, but nonetheless full control over their own product and income is worth more. The results clearly show that social capital is context specific. If farmers have too much to lose they avoid a strategy of cooperation on an individual basis.

6.3 A discussion on farmer constraints in relation to upgrading

All the previous mentioned constraints are not only affecting the farmers. The fact that farmers cannot apply improved seeds, 'enough' chemicals, sufficient fertilizers, do not have a proper store, etc. all affect quantity and quality of the product supplied to the domestic market. In addition, the lack of capital prevents farmers from investing in their business.

What do all these constraints show in relation to upgrading strategies? As can be easily abstracted from the previous analysis, it is unlikely that farmers make the difference by themselves. Their farming practise is heavily influenced by nature (drought, heavy rainfall, lack of options for water management, plant diseases) and the lack of financial means (to purchase improved seeds and invest in e.g., irrigation schemes). Secondly, although beyond the scope of this research, the small size of the land, and the current land law make it hard, in many cases even impossible, to invest in their business (land cannot be used as collateral or sold). Finally, the question is posed: is reasonable to see all small-scale farmers as entrepreneurs?

What does this mean in terms of upgrading? While farmers are constrained by land size, reliance on the unpredictability of weather, capital issues, plant diseases, and many other issues it is unlikely that farmers will take the dominant position in improving their business. Most of these problems cannot be resolved for themselves. A call for public and private action is needed.

6.4 Outcome of multiple regression analysis

The aim of this research is to make a distinction between farmers that are successful and those that are not. This dichotomy is thought to be important because it has a direct effect on the equitable outcome of upgrading strategies. The next chapter will deal with this issue at length. In this section it will be scrutinized which factors determine if farmers are successful or not.

In chapter 4 (4.5.1 and 4.5.2) a set of hypotheses is given. Each hypothesis indicated the expected causal relation between independent and dependent variable. Before the hypothesis can be tested, the model and all the hypothesized explanatory variables need to be checked for the existence of multicollinearity and heteroscedasticity (Vocht, 2008). Appendix B shows that no correlations over 0.7 have been found which indicates that no problem of multicollinearity occurred. All explanatory variables have as well been tested for heteroscedasticity (appendix D) and again no problems were found.

A purely descriptive analyses shows that only 13 farmers actually happened to produce above average in all three years. The land size of these farmers was higher than average (2.5 ha) and 70% of them were educated. But it is more interesting to use multiple regression to see the effect of the explanatory variables on average output over three consecutive years.

FIGURE 6.1
Anova test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24,720	9	2,747	6,244	,000[a]
	Residual	56,306	128	,440		
	Total	81,026	137			

a. Predictors: (Constant), The zone, Received credit, Education level, Other paid work, Distance to market, Non-pepper income, The age of the respondent, Inputs, Total farm size (HA)

b. Dependent Variable: Output over consecutive years

As can be seen in figure 6.1, the model is highly significant with 0,00. This means that the results are representative for the entire population (Vocht, 2008). The models' explained variation, R Square is 0,305 (see figure 6.2). The determination coeffi-

FIGURE 6.2
Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,552[a]	,305	,256	,66325

a. Predictors: (Constant), The zone, Received credit, Education level, Other paid work, Distance to market, Non-pepper income, The age of the respondent, Inputs, Total farm size (HA)

b. Dependent Variable: Output over consecutive years

cient gives the percentage of explained variance in Y through X (Vocht, 2008). Which means that about 30% of success (defined as producing more than average in three consecutive years) can be explained by the variables entered into the model.

Figure 6.3 shows that the following independent variables turned out to be significant with 0.05 significance level: age of respondent, distance to market, non-pepper income, and the zone. One other variable, other work is significant at a 0.10 level. This means that with 95% certainty those variables do influence the dependent variable. The received credit, total farm size, inputs, and educational level turned out not to be significant. In other words those variables do not significantly influence pepper production in consecutive years[59].

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[59] The regression formula would be as follows: $Y=B_0 + B_1X_1 + B_2X_2 + \ldots.+B_kX_k$. Thus, output over consecutive years = 0,994 - 0,13 (age) x -0,003 (distance) x 0,000 (non-pepper) x -2,15 (credit) x 0,053 (farm size) x -0,126 (inputs) x 0,180 (education)x -0,293 (paid) x -0,350 (zone).

FIGURE 6.3
Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	,994	,320		3,104	,002
	The age of the respondent	-,013	,005	-,215	-2,595	,011
	Distance to market	-,003	,002	-,166	-2,083	,039
	Non-pepper income	,000	,000	,308	3,617	,000
	Received credit	-,215	,154	-,105	-1,398	,165
	Total farm size (HA)	,053	,081	,059	,662	,509
	Inputs	-,126	,129	-,082	-,975	,331
	Educational level	,180	,124	,117	1,458	,147
	Other paid work	-,293	,173	-,129	-1,695	,093
	The zone	-,350	,140	-,215	-2,496	,014

a. Dependent Variable: Output over consecutive years

Below, each variable that turned out to be significant is put under scrutiny in relation to the formulated hypotheses in section 4.5.2.

The age of the respondent
The hypothesis expected a negative and a positive relation (younger farmers can work harder and older farmers are wiser). The table indicates that a negative relation (B -0,13) between age and output exists. It is thought that younger workers are able to work harder (red pepper is labour intensive) and secondly younger people might be more willing to apply new scientific methods which as an effect increase the output over consecutive years. The variable age is significant with 95% certainty.

Distance to market
This hypothesis followed a twofold logic. Farmers living nearby can easier obtain inputs and uphold business relations, while farmers farther away have more land to use. As can be seen from the table above, the distance to the market is negatively correlated with output (B -0,03). This means that living closer to the market is more advantageous in terms of pepper production over consecutive years. Transportation costs will be lower, inputs are more easily accessible and business relations can be maintained, all of which help to improve farming practice. The distance to the market is significant with 95% certainty.

Non-pepper income
The non-pepper income is significant with 99% certainty. The hypothesis expected to find the relation to be either positive or negative. More non-pepper income enables investment, but on the other hand shifts attention to other activities. The regression coefficient does not give an indication, since the measurement, Birr, was too small to make a difference. The finding that non-pepper is significant in explaining coincides with Leavy & Poulton (2007) that if farms become more commercialised, they rely increasingly on hired labour (Leavy & Poulton, 2007).

The zone
The hypothesis expected significant differences between the two regions. This variable is significant with 95% certainty. The results (B -0,3) shows that farmers residing in the area of Gurage see their likelihood of supplying more than average decrease 0.35 in relation to people residing in Silte.

Other paid work (0,10)
The hypothesis expected a negative relation between non-agricultural work and pepper output. This variable is significant at the 0,10 level. This is not surprising since a part of non-pepper income relates to other paid work besides farming. The regression coefficient shows a negative relation (B -0,29) between having other paid work and pepper production. This finding is in line with the idea that other activities often distract from farming.

6.5 Summary and conclusion

This chapter has extensively discussed farmers' constraints in producing red pepper. As a result of these constraints, output is on average of low quantity and quality. Due to the forces of nature farmers cannot maintain reliable supply between years. The chapter has shown that most of these constraints cannot be solved by the individual farmers alone. He or she is constraint by limited land, weather, imperfect market information, lack of capital, and many other difficulties.

In section 6.3 a distinction is made between successful and unsuccessful farmers in terms of reliability of supply. The relevance of this distinction will be made clear in the next chapter on upgrading strategies. For now it was sufficient to note that farmers (either successful or unsuccessful) will benefit differently from different upgrading strategies. The multiple regression model has shown that the following characteristics of farmers have a significance influence on the reliability of supply (age, distance to market, non-pepper income, the zone, and other paid work[60]). This finding is highly relevant for policy makers and development workers when implementing upgrading strategies.

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[60] With reliability level of 0.10.

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7. UPGRADING FRAMEWORK

This chapter starts with an introduction to, and an explanation of, the upgrading framework. Section, 7.3, provides several upgrading strategies that are thought to improve the domestic red pepper chain. Each strategy will be discussed by means of the upgrading framework. The closing section gives a discussion on the merits of the framework.

7.1 An introduction to the upgrading framework

Donors, NGOs, consultants, and governments are increasingly using the concept of value chain analysis to identify weak spots in the economy – also known as bottlenecks. These problem areas may be addressed by implementing appropriate upgrading strategies. Most organisations use the classification given by Humphrey and Schmitz (2000)[61] to decide which type of upgrading best suit a particular chain or industry (for a review of this classification see chapter 3 theoretical framework).

A common critique to the classification by Humphrey and Schmitz (2000) is the lack of applicability to the agricultural sector. As a response to this critique Gibbon (2001) proposed an alternative (provisional) classification: 1) capturing higher margins for unprocessed commodities, for example through higher levels of productivity or by moving up the grade ladder; 2) producing new forms of existing commodities; and 3) localising commodity processing (Gibbon, 2001).

Elements of both classifications are used in this study to design upgrading strategies for the red pepper chain. While fully acknowledging the usefulness of the classifications given by Humphrey and Schmitz (2000) and Gibbon (2001), it is noted that both classifications omit a discussion of the potential outcomes of the upgrading strategies for different groups at different scale levels (Laven, 2010). Although, Ponte (2009) does take a more critical stand towards upgrading strategies by scrutinizing unorthodox upgrading strategies, he still omits a discussion of the differing outcomes for multiple stakeholders.

Hitherto the focus in literature is on technical descriptions of upgrading strategies. Even though, this serves development professionals in identifying and implementing a fitting upgrading strategy, it is argued here that a discussion of potential outcomes through a normative lens (efficiency and equity) is essential to achieve a holistic perspective on the matter. For example, Gulianni (2005) pointed out that the effects of upgrading are often unequally distributed. Laven (2010) showed that upgrading often has heterogeneous outcomes to different groups and to members of the same group. Thus, applying a normative lens would not only provide a deeper understanding of the different strategies but would also allow analysis of its effects for multiple stakeholders on different levels of analysis. As has been said before, a value chain is not a concept that should be analysed without acknowledging its embeddedness in a wider social and economic reality.

By reviewing academic literature on upgrading strategies, an easy to grasp normative dichotomy emerges. A distinction can be made between those strategies associated with improving the competitive position of businesses (e.g., reaching a higher output, improving lead times) and those strategies that contribute to the achievement of development goals (e.g., poverty alleviation and inequality reduction). The given dichotomy might be problematic in the sense that it does not let a single upgrading strategy be captured by either one or the other.

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[61] Product, process, functional and inter-sectoral upgrading

However, upgrading strategies are thought to have multiple outcomes, and this dichotomy helps to characterise particular outcomes in terms of their contribution to efficiency and equity. In policy economics it is customary to examine distributive problems by means of two concepts: *efficiency* and *equity*[62]. Simply put, efficiency is about doing more for less, and equity is concerned with decreasing inequality. These two potential outcomes are useful for analysing distribution policies by clarifying to what extent a policy is contributing to a specific goal. This thesis on upgrading applies the concepts of efficiency and equity to upgrading strategies and seeks to identify efficiency and equity gains or losses. In addition, it recognise that upgrading will have different outcomes to different groups, which can be made visible by applying a scale level approach. In the next section the upgrading framework will be explained more fully.

7.2 The upgrading framework

The upgrading framework seeks to identify and to order potential upgrading outcomes by two distinct yardsticks (efficiency and equity). It uses different scale levels to analyse the effects for multiple stakeholders, and it concludes by providing a recommendation.

Before explaining the framework three remarks have to be made. Potential outcomes on the long run are not taken into account. This means that an upgrading strategy is analysed by its likely outcomes in the near future, so potential spill over effects are most of the time left aside[63]. Secondly, the position of poor small-scale farmers is seen as unjust, an issue that needs to be corrected, and third, while some scholars might see efficiency and equity as incompatible, it is argued here that society can have both equity and efficiency by managing political and policy choices correctly[64].

FIGURE 7.1
Upgrading framework

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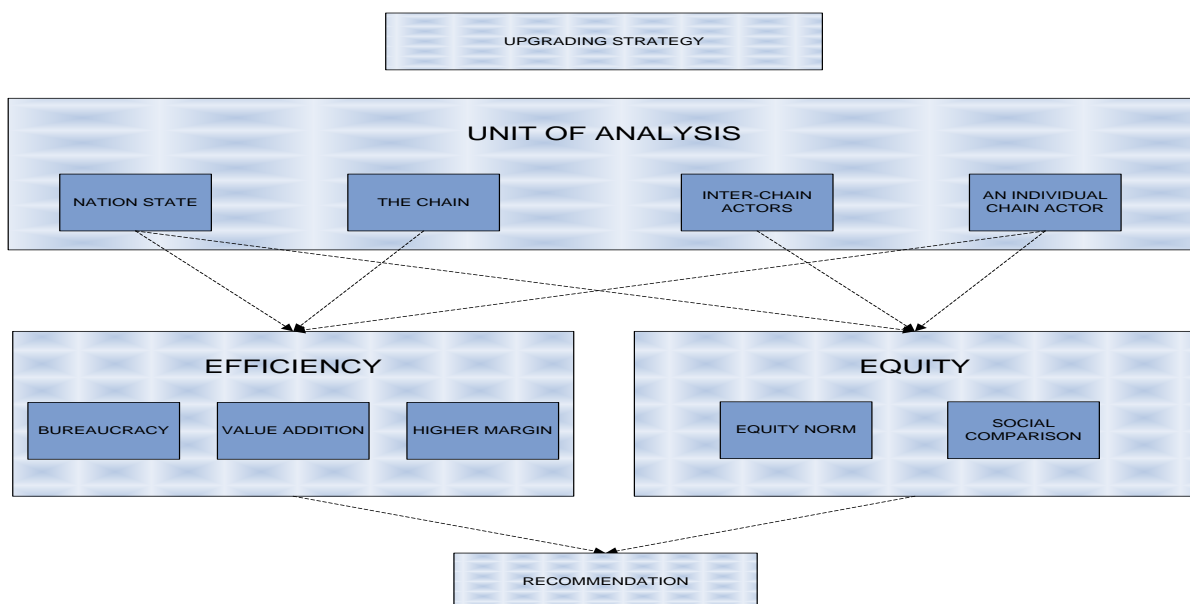
[62] Policy economics is as well interested in security and liberty but these are not part of the analysis here.
[63] In some cases, likely spill over effects are mentioned.
[64] Some authors seem to think that the two are incompatible. I would suggest that the two are compatible, and that it is a politically useful myth for the rich and powerful to think otherwise.

The first step of the framework asks to explain the upgrading strategy in the same technical manner as is common in most literature. Then each relevant '*Unit of Analysis*' should be analysed and discussed in combination with efficiency and equity. Finally a conclusion is given in the form of a recommendation. But before analysing the different upgrading strategies culminating from the research findings, first an in depth explanation is given of the different concepts used in the framework.

7.2.1 The unit of analysis

Organizing an upgrading strategy at a particular scale is not a value free activity. In other words, the scale level applied is a political decision, producing specific, often predictable biases in favour of certain actors. The larger the scale of a program and the more extensive the chain, the more difficult it will be for those targeted for economic inclusion to make their voices heard in political decision-making (Hospes & Clancy, 2009). The usage of scale in this way emerged in political ecology and is used here to discuss upgrading.

There are four distinctive scales on which potential outcomes should be analysed to provide a holistic view of the upgrading strategy. When relevant, the *nation-state* as a scale level is taken into account. At this level it is examined if the citizenry as a whole are worse off by means of taxation, or will benefit because of the upgrading strategy. Equity on this level is judged in relation to other nation-states. Does the nation-state find a more equal position towards others in terms of economic prosperity? The *chain level* is used to see if efficiency improvements are made for the entire chain (more output, higher quality) without adding costs. It is not seen as fruitful to discuss equity on this scale, since equity is only a useful concept if it can be judged against something similar, which would be another chain in this case.

Intra-chain analysis is straightforward in as such that it is used to measure changes in equity between different chain stakeholders. Finally, the *individual chain actor* is analysed in terms of efficiency and equity. This last stage of analysis is a bit more complicated. Here a distinction is made between farmers that are included and excluded from the positive and negative effects of upgrading, between those farmers that were previously successful and unsuccessful[65], between local traders and large scale traders, and between brokers who add value and those who do not[66].

Note, that in the upgrading strategies discussed in 7.3 not every unit of analysis will be put under scrutiny, and not each scale level is discussed in terms of both efficiency and equity.

7.2.2 Efficiency

Agricultural research managers and policymakers have come under increasing pressure to produce a greater impact with smaller agricultural research budgets (Alene et al., 2009). This does not only apply to researchers but increasingly efficiency demands are also placed upon professionals working in development interventions.

Efficiency is easily understood by the idea of: 'getting the most out of a given input' or put differently 'achieving an objective for the lowest cost'. Three indicators are used to examine changes in efficiency: bureaucracy, value addition, and charging more.

Some policies, in this case upgrading strategies, go together with the creation of a new body (mostly government) that needs to implement and sometimes even continuously super-

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[65] As not all small-scale farmers are poor, benefits to small-scale farmers may not adequately represent poverty alleviation objectives (Alene et al., 2009).

[66] A further distinction in some upgrading strategies is made between farmers that are part of the market chain and those that are part of sub-value chains.

vise the program of the strategy. This is adding costs to society and it needs to be analysed in terms of what potential gains are made for the same society. Another indicator for efficiency is value addition. Does the upgrading strategy leads to output improvements, in terms of quantity, quality, and or logistical improvements? (e.g., by shortening the chain), without affecting the cost-output ratio? The last indicator, which is used at the individual scale level to analyse loss or gains in efficiency is to see if the individual actor can charge more for its product, while maintaining or improving its cost-output ratio (e.g., taking away excessive profits from downstream actors).

7.2.3 Equity

Equity, in literature also known as 'fairness', relates to the idea that everyone should get the same, or at least that everyone should benefit according to their effort[67]. The two equity indicators are borrowed from equity theory applied to businesses. The first indicator, "equity norm", refers to the idea that employees expect a fair return for what they contribute to their job. Secondly, employees determine what their equitable return should be after comparing their inputs and outcomes with those of their co-workers. This concept is referred to as "social comparison" (Carell and Dittrich, 1978[68]). The first indicator relates to intra-chain analysis, in the sense that it seeks to justify what is a fair distribution of profit means in the chain. In other words, it helps to identify excessive profits along the chain and justifies redistribution of those profits. Social comparison relates to farmers that are not included in the upgrading strategy. There is however a difference between social comparison in absolute or in relative terms. Is the non-included farmer worse off than before (absolute social comparison), or does the non-included farmer perceive a decrease in equity because the included farmers see their income rise (relative social comparison)?

To make the discussion on equity more profound, a fourth indicator is helpful. The most famous definition of equity, according to political scientists is: "[Equity] is the study of "who gets what, when, and how". Thus, the task for the analyst is to sort out three questions: first, who are the recipients and what are the many ways of defining them? Second, what is being distributed and what are the many ways of defining it? And third, what are the social processes by which distribution is determined? It is beyond the scope of this study to talk about the philosophical implications of choosing what is more equitable, a fair selection of recipients, item, or process. For further details, on this complex theory see Stone (2002). But in some cases these questions are relevant when discussing equity and they will be used in the section 7.3.

To summarise, the framework asks to whom the outcome of the intervention accrue and what will be its effect on other stakeholders in the chain. Secondly, is the outcome likely to contribute to efficiency or equity, or both? Finally, a discussion is held on why some actors should lose and others should gain. There is no correct answers to this question to be found outside the political process. Section 7.2.4 will discuss this in more detail.

7.2.4 Recommendation

At the end of the framework a conclusion is given on which parties are thought to lose and who are thought to gain. Thereafter a recommendation is given regarding the desirability of

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[67] While the first indicator is clear, obviously the second is not a strong proxy because of its subjectivity. However, this is not considered as a problem since the outcomes are analysed upon its potential to reduce or increase equity. Using equity in this sense allows one to omit a normative and fixed threshold of equity.
[68] http://en.wikipedia.org/wiki/Equity_theory

the upgrading strategy. The recommendation is based upon several ideas. First, Schumpeters' concept of creative destruction states that economic growth is reached by destruction of old technologies and the creation of innovations. In other words, according to this theory no effort should be spent in protecting older versions of economic organisations. Another yardstick used is the criteria of Pareto efficiency[69]: an outcome is more efficient if at least one person is made better off and nobody is made worse off. Another yardstick used is from Kaldor-Hicks. Kaldor-Hicks does not require compensation actually be paid, merely that the possibility for compensation exists, and thus does not necessarily make each party better off (or neutral). The criterion is used because it is argued that it is justifiable for society as a whole to make some worse off if this means a greater gain for others. For example, brokers may lose some business, but if at the same time chain efficiency is improved, this is justified.

7.2.5 An example: Mareko Berbere

SOS Sahel Ethiopia – supported by Irish Aid, works on small-scale farmer improvement in the Gurage area, Ethiopia. By applying a value chain analysis they identified constraints that resulted in an upgrading strategy based upon the idea of localising processing activities (Humphrey and Schmitz, 2000). Their intervention is used here to exemplify the framework. It is explicitly not the intention to criticise SOS Sahel Ethiopia, their intervention is used only to illustrate the framework.

> **Box 7.1 SOS Sahel Ethiopia, Mareko Berbere**
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> By means of a value chain methodology, sub sector analysis, constraint identification, prioritization and finally implementation, SOS Ethiopia implemented an intervention based upon reconfiguration of the chain. In the old situation farmers would sell their raw material to local traders, who would bring the product to Addis Ababa where it would be processed and blended. SOS Ethiopia created a new sub-value chain. Representatives of the two participating farmer cooperatives started their own small processing facility in the rural area (machinery, the building, and storage room provided by SOS Ethiopia). Members of these farmer cooperatives produce red pepper, which is now bought by the small factory[70].
>
> The employees at the factory clean, crush, and mix 19 different spices (among which red pepper is the main ingredient) into Mareko Berbere. The final product is sold once a year to a bazaar in Addis, and also to local government officials. In the future, it is planned to start export of the product. SOS Ethiopia was active at the start of the process, but later limited its involvement to advice and marketing activities, with their involvement substituted by local universities and agricultural research centres. The projects' aim is to make sure that farmers receive a good price, and to empowers farmers and cooperatives.
>
> Source: interview SOS Sahel Ethiopia, Mareko farmer cooperative and Mareko wereda co-operative sector.

Potential outcomes seen through the lens of the upgrading framework
This upgrading strategy serves as an example to discuss the intervention by SOS Ethiopia. For the purpose of explanation, each unit of analysis is discussed. Thus, the question will be to

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[69] It is recognised that: "Pareto efficiency is a minimal notion of optimality and does not necessarily result in a socially desirable distribution of resources, as it makes no statement about equality or the overall well-being of a society" (Sen, 1993). To complement this argument, attention is duly paid to equity.

[70] Farmers buy shares in the company and at the end of each year they receive dividend.

whom does the intervention accrue and who is not part of it but will feel the effects (negative, or positive)?

Two development cooperatives are involved, and members of these associations receive a better price for their product and receive a dividend at the end of the year. The members are considered here as the *individual chain actor*. Now we apply the concepts of efficiency and equity to this group to examine in what way they gain or lose. Are these farmers producing more efficiently? Likely, they do get a better price for their product but it is not necessarily because they actually add more value to the product. In other words, they produce the same as before, with the same costs as before, but the only difference in the new situation is that they can charge more, which is positive in terms of efficiency from the farmer perspective. From the member farmer's perspective their 'equity norm' (a fair return for what someone contributes) is improved.

In terms of equity it is interesting to look as well to the non-member group. In this case the concept of social comparison is interesting to apply. The other members of the community are not benefiting from an increase in price but they are not worse off either. Thus in absolute terms nothing has changed for the non-members but in relative terms inequality between non-members and member farmers has risen. Interestingly, the issue of inequality is taken up by the farmer cooperatives, which have a responsibility to spend a part of their profits on local community development.

The next unit of analysis is intra-chain equity. In the new chain configuration local traders, and even spice processors in Addis Ababa are leapfrogged. They will, slightly as it is, lose income due to less available raw material and a new competitor. An efficiency analysis of the new configuration of the chain is not possible. Since it depends completely on the input-output ratio, demand for the new product, etc. and this is unknown. The analysis, with the nation state as the unit, is showing that citizens are not contributing in terms of taxation to this strategy, since a foreign NGO is the benefactor, and do not receive additional tax income as the taxable value added has simply shifted from the traders to the farmers. They might even be potentially better off if their consumer preferences are better addressed.

Conclusion/recommendation

An important question that now comes to the front is: are the potential gains for the members of the intervention, worth the loss of income for the downstream actors? The intervention has led to a more secure and higher profit for member farmers, and spill overs (in terms of new schools etc.) to local non-members. Some upstream actors might be worse off, since they face new competition (new product), but this is likely to be negligible. Application of the framework helped to understand the outcomes better, and can give a more encompassing answer to the question if this strategy is desirable.

7.3. Upgrading strategies

This section will discuss five upgrading strategies. Each strategy is based upon the findings of the research. The upgrading framework serves to put each strategy under normative scrutiny in order to analyse potential benefits and losses. In summary, each upgrading strategy is introduced, and the relevant unit of analyses are be examined in terms of their efficiency and equity outcomes and finally a conclusion/recommendation is given. The five different upgrading strategies are: (1) adjusting market failures, (2) downstream actors starts insourcing, (3) investments in small-scale farmers, (4) leapfrogging of trader, and (5) assist farmer cooperatives to work on red pepper.

7.3.1 Adjusting market failures

Introduction

In the previous two chapters it has been stated that the exchange that takes place at the market happens partially involuntarily and does not benefit both participants equally. On the surface, these problems seem to emerge from the presence of brokers, problematic practices of traders, and imperfect market information. But exploring these issues more deeply shows that most of these market failures result from malfunctioning of the institutional setting. This results in a lack of trust between the actors involved.

Therefore, to address market failures, the institutional environment of the market should be changed in order to enhance trust. One possible intervention to be implemented in the short term would be to install law and order at the local marketplace so as to prevent traders and brokers from tricking the farmers. A long term strategy is to install a formal grade system that allows farmers to identify clearly the quality of their product. Yet another issue, which needs special attention, is the lack of farmer knowledge on the type of measurement (kilograms) used at the local market. The upgrading strategy presented here is focused upon the issue of measurement since it would directly strengthen the negotiation position of the farmers.

This strategy is not easily captured by one single intervention and should preferably follow a simultaneous multi-level approach. The first step of this strategy is to introduce one common measurement, that is, kilograms, in Ethiopia. This strategy is targeted at all Ethiopian farmers that pertain to use traditional measurements. By means of promotional campaigns and educational programs the message of unification of measurement can be communicated. Obviously, this would generate knowledge and could help farmers to feel more secure about this important product characteristic. Still, this would not resolve the issue that farmers have to use the scale of the buyers (the survey showed that 75% of the farmers had to rely upon the scale of the buyer). Therefore the suggestion is made to install an independent body at the market, paid by the government or donor, who weighs the product and signs a ticket with the given amount, so as to make sure that the transaction is based upon the actual weight.

Potential outcomes seen through the lens of the upgrading framework

This strategy generates several outcomes at multiple scale levels. The nation has to pay by means of taxation for the programs that communicate the unification of measurement, and secondly, efficiency is decreased by the new installed bureaucracy generated by the unification programs.

When using the pepper chain as the unit of analysis, the following observations can be made. Due to measurement unification, it will become increasingly difficult for traders to scam the farmers. Thus, excessive profits made previously by traders and brokers are now allocated to the farmer[71]. Therefore, improvements in efficiency are unlikely on the short term. There is however a long term potential for efficiency improvements if the intervention would lead to trust creation between farmer and trader. This increased trust could smooth transactions, by externalising the need for adulteration, and would make the role of the brokers redundant. In turn this would lead to fewer costs[72].

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[71] At least not in the short run. It could be possible that these extra profits are invested in the farming business, which has the potential to improve chain efficiency.

[72] exclusion of brokers at the market would be seen as efficiency improvements, since their economic rationale is based upon the exploitation of trust, instead of value addition.

An inter-chain actor analysis shows that farmers will see their equity norm improved. In other words, farmers are now likely to receive a price that is fair for the input they deliver. By taking away excessive profits from traders and brokers, equity is increased.

Two individual chain actors are directly affected by this intervention. On the one hand, traders that exploited the lack of knowledge will lose income, however these same traders are likely to gain in efficiency in the future due to the increasing fluidity of transactions. Nothing will change for traders that were already running honest businesses. The farmers on the other hand, clearly see their efficiency increase, as they receive more for their product. When the concept of social comparison is applied, it is shown that farmers' equity vis-à-vis upstream actors is improved, while at the same time equity within the group of farmers is improved, since previously unaware farmers now obtain the same position as those farmers that already knew how to deal with kilograms in transactions.

Conclusion/recommendation

The application of the framework shows that much more can be said than the simple fact that this strategy would be part of process upgrading (Humphrey and Schmitz, 2000). It shows that two actors are potentially worse off: the cheating traders and the brokers. One might argue that brokers would lose in income if their occupation fades away. This is however justified by the argument that some brokers *raison d'être* lies in exploiting an inefficient situation: lack of trust between farmer and trader. Thus, if farmers and traders transact by excluding the brokers it is seen as beneficial in terms of efficiency and equity. For those brokers that actually do add value to the product, their position is likely to remain unchanged. Equity in terms of social comparison is increased since previously unaware farmers are now put on an even footing with those that were already knowledgeable. The fact that only those traders and brokers that were involved in scams will lose, makes it possible to argue that this strategy is desirable.

7.3.2 Downstream actors start insourcing

Introduction

Two downstream actors (Ethiopian Spice Extraction Factory, and Baltinas) are currently considering to start their own production facilities. As the previous chapters showed, the current chain configuration (characterized by insufficient output, irregular and low quality supply) is not a reliable driver for growth. Therefore, downstream actors, might be left no other choice but to resort to insourcing production.

There is however a distinction between the two companies. The aim of the factory is to retrieve an improved product (paprika capsicum), which is not sufficiently available on domestic markets. The purpose of Baltinas on the other hand, is to increase the supply of red peppers for export. Both companies are unsatisfied by the current food standards, the traceability of products, and the existing evaluation and monitoring possibilities.

To overcome the problems of the current chain, both companies are considering implementing a vertically integrated supply chain in which they control supply by taking farm activities in their own hands.

Potential outcomes seen through the lens of the upgrading framework

The nation state will gain in efficiency, since more value is added domestically, while financial resources are originating from the private sector: the factory and Baltinas. In addition, when the factory is cultivating paprika for oleoresin extraction, and Baltinas produce berbere, which is sold on the international market, vital foreign exchange is earned for the country. Besides, in comparison to other richer nations, equity is increased if Ethiopia, and especially the factory and Baltinas, manage to sustain the value addition.

The second unit of analysis, inter-chain relations, is concerned with equity differences between the different members of the chain. However, equity increase or decrease in case of the factory is not so much an issue here[73], since the chain is non-existent yet (currently, the factory is not extracting paprika oleoresin)[74]. Viewing the factory as the unit of analysis, efficiency is decreased at the start of the intervention because significant investments in terms of capital and labour need to be made. Eventually, the factory would reap the benefits and would add more value to the product by extracting oleoresin.

The Baltinas are looking for a similar intervention to that of the factory. The only aspect that makes the two interventions distinctive is the product. The factory is looking for a new product (paprika capsicum), while Baltinas are trying to retrieve more of an already existing product (red pepper). Similar to the factory, the Baltinas' efficiency will decrease due to investments made at the start of the intervention.

When the Baltinas start to produce red pepper, local producers will face a lot more competition. Under normal economic circumstances prices are likely to decrease (in case of more supply) which will reduce efficiency for farmers in general. On the other hand, if the new supply is mainly used for exports, the effect on domestic prices might be minimal. In addition to their own production facility, the Baltinas would like to push forward an agenda of monitoring and evaluating additional suppliers. The aim is to control each activity in the chain. This strategy of tighter control and implementation of monitoring and evaluation is likely to exclude farmers who are unable to meet these standards.

Conclusion/recommendation
These two upgrading strategies employed by the factory and the Baltinas, which look similar at the surface, turn out to be quite different. While both follow a path of vertical integration, the factory's intervention is not likely to be detrimental to other actors because there are currently no small-scale farmers that produce paprika capsicum. On the other hand, the Baltinas' upgrading strategy is potentially damaging to suppliers as new competition. In addition, Baltinas will become a more important actor on the international market (due to higher output). This means they need to implement standards that might not be obtainable by farmers.

In an effort to generalise this case studies' findings, an interesting addition can be made to the model of Humphrey and Schmitz (2000). While the factory is pursuing an upgrading strategy, classified as inter-sectoral, apparently no (or at least less) potential negative outcomes occur. On the other hand, the Baltinas which are pursuing a path of functional upgrading, create stronger competition with possible decreasing prices. This makes it increasingly difficult for suppliers to remain included.

7.3.3 Investments in small-scale farmers
Introduction
Small-scale farmers in Ethiopia who own only around one hectare of land on average, are often involved in surviving more than building viable businesses. As became clear in the previous chapter, most farmers have difficulties in obtaining the proper inputs (improved seeds, fertilizer and chemicals), most of them do not have access to clean (disease free) seeds, and many other issues play a role in the inability of farmers to better their situation.

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[73] Potential equity decreases can be found by analyzing the ownership of the land used. But if previous owners are hired, or sub-contracted the equity wins or losses are hard to predict.

[74] However, one could argue that those farmers that supplied the factory five years ago should be seen as the reference group. If this is done, it is likely that these farmers do not produce paprika capsicum today, which makes this group no longer part of the chain, and therefore obsolete for analysis.

The government, international donors, NGOs, and national and international investors are all potential drivers for enhanced small-scale farmer output through large scale investments. In aiming for a more equal distribution of inputs, examples could include an improvement in farmers access to irrigation, or other potential output generating upgrading strategies. However, it is not of concern here what these investments are precisely used for. The aim of the upgrading strategy discussed in this section, is to examine the potential outcomes of an investment that generates higher output.

Potential outcomes seen through the lens of the upgrading framework
It should be noted that there are differences between national and international investors[75]. First, when the money originates from within the state apparatus, the people pay through taxation for both the investment and the accompanying bureaucracy. If the money originates from foreign donors, additional taxation is not an issue to be taken into account. Secondly, it could be suggested that foreign donors are *more* preoccupied with development goals than domestic investors, who are likely to focus on efficiency gains and a high return on investments. National governments are expected to take a position in the middle. A further point of concern is whether investors are willing to take the risk to invest in small-scale farmers, since they will always weight the opportunity costs and risks of such a decision.

The pepper chain is currently operating in an inefficient manner. Farmers do not produce as much as they potentially could. According to previous studies the average production of farmers is estimated at 600 kilos per hectare, while an average of 1500 is potentially obtainable (when a more scientific method of farming is applied) (interview: Melkassa). If the intervention could facilitate farmers in producing a higher output, while not negatively influencing the cost/output ratio, chain efficiency would increase. In addition, a stable flow and greater supply throughout the chain would potentially offset new business opportunities for downstream actors such as retailers, exporters, and the factory.

An intra-chain analysis shows that equity is not an easy to grasp concept in this case. The mere fact that farmers produce more does not automatically imply that they also gain in equity in relation to actors further downstream since downstream actors are likely to benefit as well from greater supply. There is however one upgrading strategy that could potentially change this situation. Currently, farmers are likely to see, at some time, their complete harvest destroyed due to drought. If farmers would gain access to irrigation, a higher chance of a successful harvest throughout the years is created. In this case, their income will be more stable in comparison to traders, who normally had more opportunities than farmers to cope with low production by moving into other products. Hence, the equity norm of farmers in relation to traders is improved.

The last unit of analysis discussed here, is the individual chain actor: the farmers. Obviously those farmers included in the investment scheme will benefit (assuming the investment is successful) in terms of a higher profit and efficiency improvement – that is, if the relative cost/output ratio does not change. On the other hand, farmers that are not part of the investment scheme will not be worse off in terms of income, but they will lose equity in relative terms against farmers that were part of it.

The selection of farmers in this upgrading strategy is highly relevant for meeting the goal of poverty reduction. An important aspect of equity, besides item and process, are the recipients. Who are the small-scale farmers that are included in the scheme? Relatively poor farmers, or previously successful ones? Or both? This decision will have an important effect

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[75] For the investors there is another economic issue that needs to be addressed. There are always opportunity costs: alternatives that could generate the same or higher profit with lesser or equal risk. It is likely that only those interested in development goals as well, are willing to make the 'risky' investments.

on the goal of poverty reduction. In the case that previously successful farmers are included, the gap between these farmers and less successful farmers is likely to increase.

Conclusion/recommendation

Investment in small-scale farmers is likely to have many positive effects. Farmers included in the intervention will see their efficiency increase (higher output), as well as their equity in relation to downstream actors if production in multiple years is made possible. Although, non-included farmers' relative equity is decreased vis-à-vis included farmers, they are not worse off in absolutely terms because of the intervention. A point of concern here would be how to selection of farmers so that is perceived as fair by all (Stone, 2002). Would competition, lottery or a voting process be considered as the right way to select participants? Or would it be wise to make a selection based upon success of the farmer, since this factor is essential in reaching the target of poverty reduction. Even then, are the successful ones given the investment, as they are most likely to use it effectively, or are the unsuccessful ones given the investment as they are most in need of income increases and efficiency improvements?

7.3.4 Leapfrogging of local traders/brokers

Introduction

The analysis given under upgrading strategy (1) *Adjusting market failures,* implicitly maintains the structure of the local market. Farmers keep bringing their product to the local market, where it will be bought by local/regional traders. The upgrading strategy proposed here is to leapfrog local traders and brokers. Thus, this upgrading strategy seeks to eliminate the local market completely and let farmers sell their product in the final market directly.

Normally, this strategy would entail local farmers bringing their product to the final market, however, in an attempt to avoid a selection of successful farmers with the means to do this, the idea proposed here would be to let traders from Addis Ababa come to the rural area instead. Farmers would bring their product to the nearby kebele compound (not to be mistaken with the local market, shared by several kebeles) and sell their product to the traders from Addis Ababa for the price set in Addis Ababa with a premium for non-adulterated products. As will be clear from the upgrading framework to be presented below, this strategy is not without negative consequences either.

Potential outcomes seen through the lens of the upgrading framework

The chain will gain in efficiency since non-value adding steps (local traders and brokers) are removed. Yet, extra transportation costs, the need for a communal broker to make arrangements, and the premium payment to the farmers all seem to decrease efficiency. A calculation is needed to prove if efficiency has been enhanced.

The intra chain analysis shows that farmers are (if efficiency is increased) gaining a better position vis-à-vis downstream actors. On the other hand, the gain of the farmers is made at the loss of local traders and brokers, who are worse off due to this strategy. If all small-scale farmers would sell to Addis Ababa traders, local traders would lose their income, and will most likely turn out to be unemployed; hence, the equity in the chain is jeopardized. More likely, local traders will earn less rather than become totally unemployed, since not all farmers will sell directly to the capital traders.

The effects seen at the intra-chain unit of analysis correspond almost entirely with those of the individual actors. Traders and brokers are worse off. The included farmers on the other hand are likely to gain in efficiency, since they will get a fair price and might even make a premium on their product. Their equity vis-à-vis downstream actor is raised due to higher profits. The excluded farmers still have to rely upon the local market for their exchange. A question relevant in terms of social comparison is, 'who are the included farmers in this up-

grading strategy?' Most likely Addis Ababa traders want to deal with farmers that can generate a high quantity and quality, because dealing with small suppliers would raise transaction costs.

Conclusion/recommendation
This strategy would possibly contribute to efficiency at the chain level and at the level of the included farmers. However, these improvements make other groups, the local traders and brokers, worse off. In addition, non-included farmers would still have to use the local market for their exchange and are therefore potentially worse off. The non-included farmers are likely those farmers that were previously already less successful, so equity in terms of social comparison decreases even further as the previously successful farmers become even more successful. Thus, applying the upgrading framework to this strategy exposes that unsuccessful small-scale farmers are actually worse off in this case.

7.3.5 Assist farmer cooperatives to work on red pepper

Introduction
In the research region there are several *multiple purpose farmer cooperatives* who work with many different kind of agricultural commodities. Currently, only a few farmer cooperatives purchase and sell red pepper. An extensive explanation for this situation is already provided in chapter 6. In short, the product of red pepper appears to be too risky for most farmer cooperatives to include in their business. The only two cooperatives in this region continuously working with red pepper, are closely related to an NGO(see example 7.2.4 on SOS Sahel). However, in times of increased production, other farmer cooperatives shift to this product, but when production levels decrease, they quickly turn to other products again. The high price fluctuations (see chapter 5) are behind the decision not to purchase red pepper. Moreover, most farmer cooperatives are small, lack a proper storage facility and sufficient working capital to bridge the gap between purchase and sale.

In spite of these economic disadvantages, in terms of development there is a great need for small-scale farmers to work with this crop. This crop is the main cash crop for the region. As is shown quite extensively in the previous chapters, farmers face a poor bargaining position at the market. Farmer cooperatives are proven to be highly effective in strengthening individual negotiation power (Akpabio, 2008)[76].The intervention proposed here is to provide local storage facilities and to build management capacity of these farmer cooperatives. The latter has the aim that cooperatives can maintain working on this product continuously (e.g. by strengthening relations with buyers, so as to take away the need for working capital).

Potential outcomes seen through the lens of the upgrading framework
In this case the upgrading strategy is explicitly targeted to alleviate poverty. As has been noted earlier, farmer cooperatives are not likely to implement this strategy by themselves. Outside assistance is needed in the form of an NGO or government body. These activities are (when done by wereda cooperative sector) paid by taxation, and come at a cost to the nation and its people.

The chain as a whole is likely to be more efficient due to this intervention since farmer cooperatives are built extensively on trust, which allows for agreements on product requirements (no adulteration, timely delivery, etc.) and will smoothen transactions.

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[76] all kind of additional services (credit and insurance capacity development; input supply; etc..) that would potentially provide efficiency gains.

From the perspective of included farmers, inter-chain relations will become more equal than before, and farmers are more likely to get a fair share for their product. Their income will rise, while no additional costs have to be made.

Finally, some comments regarding the individual chain actors need to be made. Especially local traders will probably be worse off, since they will have less quantity of product to handle. Member farmers are better off, since intra-chain price difference are made more equal, and they can charge more. Thus member farmers gain in efficiency and equity. For non-included farmers the situation is not likely to improve, however at the same time it will not worsen either. There might even be spillover effects in the long run, since farmer cooperatives are expected to take care of their communities (see example on Mareko Berbere, 7.2.4).

Conclusion/recommendation

Advancing farmer cooperatives to work on red pepper will contribute to poverty reduction for member farmers, and potentially generate spillovers for the wider farmer community (thus, the non-member farmers). However, local traders and brokers might experience smaller quantities of pepper offered at local markets, and potentially see their income levels decline[77].

7.4 Discussion on applicability of the framework

The aim of the upgrading framework is to show that upgrading strategies are politically driven. The 'who gets what?' question is particularly interesting. The framework identifies who wins and who loses as a result of the intervention. It is, however, up to the individual that implements an upgrading strategy to decide what is acceptable and what is not. This framework creates the possibility to adapt the strategy according to the outcome, so that a maximum number of actors can win with the new strategy.

Is the framework applicable to all upgrading strategies? As it turns out, some strategies are more difficult to put in the framework than others. In the case of the factory, when a new value chain is created, it might be more sensible to discuss equity at a different unit of analysis. The focus could shift for example to the way the land is acquired or to how potential employees are recruited. Another strategy, not discussed so far, is to enhance local demand of paprika capsicum by introducing a new blend of berbere. This strategy appeared to be too hard to discuss within the framework, since too many variables were unknown.

This suggest that the framework is most applicable to adjustments in pre-existing value chains. When a new product is part of the intervention, or the intervention is not directly related to an adjustment in a value chain, the framework appears to need further development.

Hence, the framework has proven to be applicable to most of the upgrading strategies posed. It helps to identify ethical questions and the framework makes clear what potential outcomes can be expected for different actors involved in the chain. Whether efficiency or equity is the highest goal, the framework generates interesting answers.

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[77] One could argue that for the non-member farmers, intra-chain equity will decrease. If traders are making less profit there is a possibility that local traders and brokers will squeeze the non-member farmers even further to maintain their previous income levels.

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8. CONCLUSION/DISCUSSION

This study of the "supply side constraints on Ethiopian red pepper and paprika capsicum production and exports" aimed to find the causes behind the current problems of insufficient output, and irregular and low quality supply. The approach taken, based upon Global Value Chain analysis, is to map the configuration of the chain for the domestic and export market, to identify constraints, to assess the governance structure and to pose relevant upgrading strategies in order to answer the following research question:

- **"Which supply side constraints are impeding a continuous supply of high quality red pepper and paprika for export?"**

The underlying assumption of this research is that the chains outcome (insufficient output, irregular and low quality supply) is related to chain governance, constraints, and the institutional environment. Each of these elements is hampering or constraining upgrading strategies in some way. This assumption is captured in the following hypothesis:

"It is anticipated that small-scale farmers, who are mainly producing for the domestic market are positioned in a market governance structure, and farmers who are producing for the international market are part of a vertically integrated structure. In the vertically integrated structure upgrading is more likely to be driven by an internal stakeholder, while the market governance structure needs facilitation from an external stakeholder. The farmers producing red pepper and paprika can be divided into successful and unsuccessful farmers of which the first derive more benefits from upgrading."

By means of the Global Value Chain approach (GVC) this research provides an answer to the central question and hypothesis. The GVC approach combines a firm oriented focus (constraints) with inter-actor relations (governance) with the underlying assumption that constraints and governance determine possibilities for upgrading. Besides, the GVC approach, theories from New Institutional Economics have been used to analyse the institutional environment and social-economic relations between actors.

- **"What is the basic structure of the red pepper/paprika chain in Ethiopia?"**

First, as is made clear in the hypothesis that it was expected to find small-scale farmers cultivating red pepper *and* paprika capsicum. The research findings indicate that small-scale farmers do not grow both of these products. While red pepper is grown by small and large scale farmers alike, paprika capsicum is solely grown by large scale commercial farmers. For small-scale farmers who had heard about the variety of paprika capsicum, producing it was perceived as too risky. "*Domestically, there is just one buyer, the Ethiopian Spice Extraction Factory*", the farmers reasoned. "*Moreover*", they continued "*when the price plummets, or when the factory decides not to buy, there is no other outlet for our products*". Hence, farmers are reluctant to plant this new variety. Secondly, as predicted by the hypothesis, the red pepper chain can indeed be grouped into two different strands. The first strand is supplying pepper for the domestic market, and the second is exporting pepper to the international market.

This study's intent is to address the constraints of the supply chain in which small-scale farmers are the main producers, in order to support all inclusive growth, which means

that large scale farmers are excluded from the process. As has been mentioned before, paprika capsicum is not grown by small-scale farmers currently, nor are they willing to produce it in the future, therefore most attention in this study is devoted to the red pepper chain, in which small-scale farmers are presented.

- **"Which supply side constraints do farmers, traders, exporters, the Ethiopian Spice extraction factory, and other institutional stakeholders face in producing and trading red pepper/paprika?"**

In the domestic chain not all stakeholders are hampered by insufficient output, low quality and irregular supply. While, on the one hand, the Spice Extraction Factory and Baltinas need to explore new ways, by means of vertical integration, to become competitive businesses on the international market, large wholesalers, on the other hand, can benefit from the current circumstances by buying and selling at the right time. Further upstream actors such as local traders, and farmers are hampered by a multitude of constraints - traders lack working capital, and farmers have insufficient water structures, problems with plant diseases, and many others - of which most are beyond their control or ability to solve. As a result, in some years, local traders and especially farmers are deprived of their income, and see their livelihoods degenerate.

- **"What type of governance can be found in the red pepper/paprika supply chain? And to what extent is the institutional environment hampering or constraining the pepper/paprika chain?"**

Since the chain is characterised by insufficient output, low quality and irregularity of supply, the focus of attention lays at the production site, in this case, the farm. While the constraints mainly focused on production, governance is primarily concerned with product exchange. The research findings indicate that the majority of pepper transactions take place at the local markets. Before indicating how governance is organised in the domestic and international chain, attention is given to the embedding of the local market in the wider institutional environment.

As of late, the Ethiopian government has pursued an agenda of agricultural market liberalisation with the objective of increasing agricultural production through improving the economic incentives of farmers and the participation of the private sector in economic activities (Getnet, 2008). The evidence suggests that the liberalized pepper marketing system lacks important institutions to reduce risk and high transactions costs. The absence of formal institutions allows people to behave in ways that undermine the principles of the market economy: corruption, malpractices, and rent seeking behaviour.

The research findings indicate further that the local market suffers from institutional failures, such as a lack of market oversight, absence of a formal grade system and incompatible measurement of transaction. All these failures result in distrust and lack of cooperation between different stakeholders.

Gereffi (2005) constructed a five-type typology[78] which is supposed to capture most empirically found governance types. The domestic chain's governance structure fits clearly in the typology's class of the market type. In this type of governance transactions are characterised as on spot market transactions, with multiple actors present, and a relative easiness of

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[78] Market, modular, relation, captive, and hierarchy

shopping around. Moreover, the domestic chain shows hardly any signs of a formal governance structure. This means that there is no cooperation on quality characteristics, lead times, and other value chain related issues between farmer and trader. Although informal means of cooperation are found (regular customers, etc.) these do not result in chain improvements or institutionalization of best practices.

Hence, the domestic market chain follows a governance structure that is similar to an arms length market. The export chains, Baltinas and the Spice Extraction Factory, show a different picture in terms of cooperation between them and suppliers. Within these chains a formal flow of information (advice, transaction characteristics) between stakeholders is observed, and inputs (improved seeds, and in some cases fertilizers and chemicals) are in some cases distributed. These findings suggest that more possibilities are likely to emerge from within the value chain. Provided that these export firms are willing to invest, farmers might see their position within the chain improve, however a note of caution is necessary, since importers are increasingly demanding strict monitoring and evaluation and this can drive out unsuccessful farmers.

The typology given by Gereffi (2005) does not provide the possibility to classify the difference between the domestic chain and the export chains. This is perceived as problematic since the results have shown that the different chain configurations have a major influence on upgrading possibilities.

- **"Which variables have a significant influence on success (regular supply) of small-scale farmers?"**

Before bringing constraints, governance and upgrading together, it is important to analyse the group of small-scale farmers. GVC literature employs a rather simplistic view of different type of farmers, using only one variable: farm size. This study has aimed to contribute to typology research by analysing farmer characteristics that help to explain farmers' success, in terms of production in consecutive years, within the red pepper supply chain. By carrying out a multiple regression analysis it is determined which variables are significant in relation to the dependent variable. The following variables were significant: age, distance to market, non-pepper income, the geographical location and other work[79].

These findings are particularly interesting for people that undertake interventions in value chains. Up to now, most value chain studies differentiate farmers primarily upon land size. This study's results indicate that besides farm size, multiple factors determine the success rate. As the answer to the next sub-question will show, it is of utmost importance to know exactly which farmers are selected and included in the intervention, since the composition of recipients determine if the important goal of poverty reduction is met or not.

- **"What are feasible upgrading strategies for enhancing improvements in terms of efficiency and equity for the various stakeholders in the red pepper/paprika value chain?"**

All the previous given results on constraints, governance type and indicators of farmers' success are necessary input for the debate on upgrading. Upgrading refers to improving an individual company, strand of a chain or an entire chain. The main research question, "Which supply side constraints are impeding a continuous supply of high quality red pepper and paprika for exports?" is now to be answered. The fact that farmers are severely constraint

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[79] All with a significance of 0.05%, except for other work, with a significance of 0.10%.

by unpredictable weather, have limited access to capital, fertilizer and improved seeds, and are severely constrained by the current land law gives them little space to manoeuvre and adapt to a changing environment. A common strategy, to cope with the previously mentioned constraints, is to form farmer cooperatives. However, the research results indicate that farmers are either not fond of these cooperatives, or are unwilling to start without outside assistance, in the form of NGOs or government officials. Most farmers' reluctance to cooperate in the stage of marketing is due to the urge to keep control of when and for how much to sell their product. This unwillingness to cooperate in the marketing stage is particularly striking when considering that in the production stage most farmers cooperate intensively in a system locally known as *Geza*. This leads to the conclusion that social capital, defined by Fukuyama as "*an instantiated informal norm that promotes co-operation between two or more individuals. In [in order to] reduce transaction costs*"(2001), is highly context specific.

Moreover, the fact that local traders lack sufficient working capital and the evidence that Addis Ababa wholesalers benefit from irregularity and price fluctuation suggests that change from within the supply chain is unlikely. Furthermore, the finding that the domestic chain is functioning basically without a formal type of governance, but depends mostly on informal forms of governance suggests that significant improvements are unlikely to materialise. The inability of farmers and local traders, the unwillingness of wholesalers, and the absence of formal governance are all considered to be the main contributors to this situation. As a result, the emergence of endogenous improvements is highly unlikely.

Because it is not likely for endogenous improvements to be made, public-private initiatives are needed. This study proposes five upgrading strategies (adjusting market failures, downstream actors start insourcing, investments in small-scale farmers, leapfrogging of traders, and assisting farmer cooperatives to work on red pepper), all of which are thought to improve the supply side constraints of Ethiopian pepper for exports.

Each of these upgrading strategies is scrutinized based upon potential outcomes in terms of efficiency and equity. It is noted that insufficient research has been done to clarify the effect of upgrading strategies for different stakeholders. Therefore this study proposes to use the upgrading framework, presented in chapter 7, when developing an intervention strategy.

One of these upgrading strategies is to introduce a common measurement for transactions throughout Ethiopia. Around 60% of the farmers measure the weight of their product by means of different types of sacks, while at the market transactions take place in kilograms. The idea of the upgrading strategy is to strengthen the negotiation power of farmers at the local market, in as such to enable them to receive a fair price. Analysing this upgrading strategy through the upgrading framework shows that some parties are worse off, while others will gain from the intervention. The farmers, who were previously scammed because they were unknowledgeable about the measurement used in the market, are thought to run a more efficient business since they can now charge more for the same product then they could before. Moreover, these farmers will see their position vis-à-vis other farmers, who were already knowledgeable of kilograms, improve resulting in a more equal society. Local traders and brokers who previously scammed the farmers by manipulating the weight will now see their income drop as farmers become more aware of the fair value of their product. The upgrading framework makes these elements explicit and recommends this upgrading strategy over the others as the only ones who lose are presently not adding value to the product.

Why is investment needed in this specific crop? First of all, in the research area, most farmers' livelihoods depend significantly on the earnings produced by it. Secondly, investing in this crop makes sure that small-scale farmers are included, since the crop is labour-

intensive. Thirdly, according to PASDEP, Ethiopia needs to diversify its reliance upon a few selected high profitable products to make sure that a constant flow of foreign exchange is generated. Thus, upgrading of the spice sector and in particular red pepper and paprika capsicum is important because it would improve the livelihoods of farmers, and in addition, the product has the potential to strengthen the relation between the agricultural sector and the industrial sector. As this study has shown, improving the export chains of both products has the potential to improve the position of small-scale farmers, provided that the institutional environment is functioning properly and enables small-scale farmers to enjoy the benefits of export.

This study has touched upon several subjects, though obviously not every issue has been explored fully. First of all, further research is needed to identify issues related to red pepper's diseases. A range of diseases is causing *Adric*, which is severely hampering a sustainable flow of products. Secondly, it could be highly beneficial to farmers if more research is done to the unwillingness and inability of farmers to work in farmer cooperatives. Finally, a possible relation between Spice Extraction Factory and commercial farmers that produce paprika capsicum needs to be explored, since it could effectively improve Ethiopia's foreign exchange generation.

From a scientific point of view, it is considered important that GVC analysis conceptualizes farmer typologies from a value chain perspective. In addition, further research could be done to extend the upgrading framework to make the discussions on upgrading in relation to efficiency and equity more fruitful.

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Websites:

http://www.intracen.org/

Appendix

APPENDIX A. Questionnaire

!!!!!ALL DATES ARE IN ETHIOPIAN CALENDER. CURRENT YEAR: 2002!!!

ID		Number: ⊖¼Y		
00	Do you normally produce red pepper for home consumption or cash generation? አብዛኛውን ጊዜ በርበሬን የሚያመርቱት ለቤት ውስጥ ¼ i N ነው ወይም ለገቢ ም ምንጭ?	1. Home consumption ለቤት ውስጥ Δ	2. Cash consumption ለገንዘብ ምንጭ Δ	3. Both ሁለቱም Δ
		If 1. Thank respondent	1 Quintal = KG _____ 1 Tkka = quintal _____	
01	Full Name enumerator £ L T± \n]lŧ LŧEŧ ^N	Name:... ስም		
02	Date of interview Ethiopian Calender L°¨e £pªTµlrd¿	1.Day: ቀን	2. Month: ወC	3. Year: አመት
03	Zone ዞን	1. Siltie ^G°ŧ Δ		2. Gurage µiWµi Δ
04	Wereda 'T«	1. Lanfuro Fn×Z Δ	2. Dalocha Δ «Eɵu	3. Merekko MTj Δ	4. Meskan L^g¿ Δ
05	Kebele ⊡lEi	1. Warisha Shanka Δ	3. Abott Tirora Δ	5. Kuno Alemena Δ
		2. Rapi Δ	4. Metayahu Denge Δ	6. Gota Mendifa Δ
06	Full Name of Household head £†m'W'ŧ LŧEŧ ^N	Name: ስም		
06:1	For how long have you been primarily responsible for farm management? I^Ya ^W F¨ EN¿ ¦CG µɵSI p\MYpC }'ŧ £\WA'ŧ	Years: I†Lr		
07	Language of the interview L°¨e £pªTµlr k¿k	1. Amharic †MYf Δ	2. Silte ^G°ŧ Δ	3. Merekina MTff Δ	4. English ^¿ Eŧśf Δ
08	Signature enumerator £ L T± \n]lŧ ÖYM			
09	Signature Thijs Rutgers			

1. DEMOGRAPHICS

A1#	Sex ፆታ	1. Male: ወንድ Δ		2. Female: ሴት Δ	
A2	What is your age? ^ Ml•r ^¿r ነው?	Years:... አመት			
A3	What is your highest completed educational level? የትምህርት ደረጃ	1. None ምንም Δ	2. Primary School የመጀመሪያ ደረጃ Δ	3. Secondary school ሁለተኛ ደረጃ Δ	4. Higher ከዚያ በላይ Δ
			(If 2,3 or 4, go A6)		
A4	Can you read? ማንበብ ይችላሉ?	1. Yes: አዎን Δ	2. Little bit: ትንሽ ትንሽ Δ	3. No: አልችልም Δ	
A5	Can you write? LÑÙ ¨vFEŧ? መፃፍ ይችላሉ?	1. Yes: አዎን Δ	2. Little bit: ትንሽ ትንሽ Δ	3. No: አልችልም Δ	
A6	What is your marital status? £¶nu Al}iq?	1. I am married አ nuEAi Δ		2. I am divorced ፈትቻለሁ Δ	
		3. I am single አላገባሁም Δ		4. I am widowed መበለት Δ	
A7	What is your religion? ሃይማኖት ምንድን ነው?	1 Islam ሙስሊም Δ		2. Orthodox Christian ኦርቶዶክስ Δ	
		3. Protestant ፕሮቴስታንት Δ		4. Other, specify... ሌላ ከሆነ ግለጹ	
A8	How many children do you have that live at home? ከእርሶ ጋራ የሚኖሩ ምን ያህል ልጆች አሎት?	Number: በቁጥር:-			
A9	How many of them help you on the farm? ምን ያህሉ G´v በ^Ya ^W ላይ እርሶን ይረዳዎታል?	Number: በቁጥር:-			
A11	How many months per year do you spent on farm activities? I†Lr 'i^¼ N¿ ¦CG 'Wsv I^Ya ^W F¨ µɵSI•r¿ ¦ 'ŧFEŧ?	.... 'Y I†Lr months per year			
A10	What do you do if not working on the farm?	Paid work:		1. Yes: አዎን Δ	
		No other work		1. Yes: አዎን Δ	

A12	Do you sometimes produce twice or more harvests of red pepper for cash per year? L † L r ʼɨ^¼ Š†¿ µ⌀ʂⅠ ⅠF¨ †NypAG	1. Yes: △ አዎን	2. No: △ አላውትም		
A13	Do you manage to harvest every year more red pepper from one timad? £ⅠYⅠX NYr NYqM}p‖ Ⅰ£† L p‖ Š¼M F¨ ˆ£¾ L T L¼pG¿	1. Yes: △ አዎን	2. No: △ አላውትም		

B. TOTAL LAND and RED PEPPER PRODUCTION

B1	What is your total farm size in 2002? Ⅰ2002 ¦E⌀r የእርሻ ስፋት ምን ያህል }ʼⅰ?	1. My own: የራሴ የሆነ /የግል/		Timad: Ⅰ ጥማድ፦-		Hectare: ⅠBŒqY
		2. Rent: የተከራየሁት		Timad:		Hectare:
		3. Total አጠቃላይ		Timad:		Hectare:

B2 ∧	How many timad, quintals, and revenue of red pepper did you had in the last three years? mE×r _^r † L q r ʼɨ^¼ ምን ያህል ጥማድ †T\ⅰ፣ ኩንታል እና ገቢ †µ′ж?	YEAR EC አመት	TIMAD ጥማድ	QUINTALS (SELL) £p`° Ⅰኩንታል		average Price /per Kg †M<„ ¨¶ ⅠŠ⌀E⌀ WN	REVENUE (birr) ገቢ /በብር/
				Harverst	Sell		
		1) 2001 (C)					
		2) 2000 (B)					
		3) 1999 (A)					

B3	How many timad will you (Have you) allocate (d) this year (2002) for red pepper cultivation? በ2002 ለበርበሬ ምርት ምን ያህል ጥማድ መሬት ነው ያዘጋጃችት?	Timad:… ጥማድ፦-
B4	Can you give an estimate of total yield in quintals you expect for this year? (Red pepper) በዚህ አመት በጣምት ምን ያህል ኩንታል በርበሬ አመርታለው ብለው ያስባሉ //	Quintals:…. በኩንታል፦-

B7	Why don't you produce the same quantity of red pepper every year?		
0	1. The land cannot give similar quantity in consecutive years በተከታታይ አመታት መሬቱ ተመሳሳይ ምርት ስለማይሰጥ	1. Yes: አዎን △	2. No: አላስብም △
	2. I expect a lower price, so I allocate less land to pepper ዝቅተኛ ዋጋ በርበሬ ይኖረዋል ብዬ ስለማሰብ አነስ ያለ መሬት እጠቀማለሁ	1. Yes: አዎን △	2. No: አላስብም △
	3. When I produce different crops, I spread the risk የተሰያዩ ሰብሎችን ሳመርት አስጊ ሁኔታዎችን ይቀንስልኛል	1. Yes: አዎን △	2. No: አላስብም △
	4. It is very hard to get all the required seeds, fertilizer, chemicals year after year እንደ ዘር፣ ማዳበሪያ፣ ኬሚካል ያሉ አስፈላጊ ነገሮችን በየአመቱ ማግኘት በጣም ከባድ ስለሆነ	1. Yes: አዎን △	2. No: አላስብም △
	5. The weather does not allow pepper production every year የአካባቢ አየሩ በየአመቱ በርበሬን እንድናመርት ያግደናል	1. Yes: አዎን △	2. No: አላስብም △
	6. My harvest gets affected by disease	1. Yes: አዎን △	2. No: አላስብም △

B8	What makes you decide to produce red pepper? በርበሬን ለማምረት እንዲወስኑ ያረጉት ምክንያት የትኛው ነው E		
0	1. The price of last year ባለፈው አመት በነበረው ዋጋ	1. Yes: አዎን △	2. No: አላስብም △
	2. Your future expectation of price ለወደፊቱ ይኖራል ብ§ የገመrŠⅰት ዋጋ	1. Yes: አዎን △	2. No: አላስብም △
	3. Extension agent advise to produce pepper በGMr ባለሞያዎች ምክር /በርበሬን እንዲያመርቱ/	1. Yes: አዎን △	2. No: አላስብም △
	4. The amount I produce this year is based on the disease from last year የዚህ አመት ምርቴ የሚወሰነው ባለፈው አመት በነበረው Ⅰ ሽታ ነው?	1. Yes: አዎን △	2. No: አላስብም △
	5. The rainfall before decision to plant red pepper ዘሩን ከመዝራት በፊት ይመጣል ብለው የሚገምቱት በዝናብ መጠን	1. Yes: አዎን △	2. No: አላስብም △
	6. Perception of future rainfall ለወደፊቱ ይመጣል ብለው የሚያስቡት የዝናብ መጠን	1. Yes: አዎን △	2. No: አላስብም △

C1	Can you name the quality characteristics your buyer is looking for? lμ¦ F¨ ገጎኮዎች ከእር_ L ïTn የሚፈልገውን የጥWት መጠን /አይነት/ ያውቂታል? **Do not give the possible answers!! Give the respondent some time to memorise. Continue asking until you have three characteristics or more.**	0. No I Cannot Δ አላውትም		
		1. Name of variety የአይነቱ ስም	1. Yes: Δ አውቃለው	2. No: Δ አላውትም
		2.Taste ጣእም	1. Yes: አውቃለው Δ	2. No: Δ አላውትም
		3. Size መጠን /ልክ/	1. Yes: አውቃለው Δ	2. No: Δ አላውትም
		4. Texture ቅርፅ	1. Yes: አውቃለው Δ	2. No: Δ አላውትም
		5. Pungency level (hotness) የሚሰነፍጥበት /የሚያቃጥልበት ልክ/	1. Yes: Δ አውቃለው	2. No: Δ አላውትም
		6. Colour unit መልኩ /ቀለሙ/	1. Yes: Δ አውቃለው	2. No: Δ አላውትም
		7. Moisture level እርጥብ የሆነበት ልክ	1. Yes: Δ አውቃለው	2. No: Δ አላውትም
		8.Capsaicin content ያካተተው የንጥረ ነገሮች መጠን	1. Yes: Δ አውቃለው	2. No: Δ አላውትም
		9. Clean from other material ከላላ ንጥረ ነገሮች ነፃ መሆኑ	1. Yes: Δ አውቃለው	2. No: Δ አላውትም
		10. Other, specify.. ሌላ ከሆነ ግለፅ		
C2 $	How do you measure the weight of your red pepper?	1. I use (a) Mizan that I own/friends/market Δ		1. I use (a) Mizan from buyer Δ
		4. Other, specify EIF ‹E ¨µE Î		
C3 $	How do you know if the red pepper is of high or low quality? በርበሬዎ ምርጥ /ጥራት ያለው/ መሆኑንና አለመሆኑን እንዴት ያውቁሉ?	1. I compare my red pepper with my neighbours' Δ ከጎረቤቶቼ ካሉት ጋር በማስተያየት		2. Get advise from the association Δ ከመህበር በሚሰጠኝ ምክር መሰረት
		3. I get advise from extension workers ከGMr ሰራተኞች በሚሰጠኝ ምክC Δ		4. The buyer tells me Δ ገዥዬ ይነግረኛል
		5. I can tell myself Δ በራሴ አውቀዋለው		6. Other, specify… ሌላ ‹E ¨µE Î
C4	In 2001, what was the quality of your harvest, in comparison to previous years? በ2001 የምርቶ ጥራት ከዚህ በፊት ከነበሩት አመታት ሲነፀር እንዴት ነበር?	1. Low quality: (Foose) ጥራቱ የወረደ ነው Δ		2. High quality: (Mamia) Δ ጥራቱ ከፍተኛ ነው

5	Has your 2001 harvest of red pepper been affected by: በ2001 የበርበሬ ምርት ያገኙት ሰብል በየትኛው ተጠቅቶ ነበር ?					
)	1. Disease በበሽታ	1. Yes: Δ አዎን		2. No: Δ አልተጠቃም (If 2, go C5:5)		
				Receive treatment?		**Did it help?**
	2. By what type of disease? በየትኛው በሽታ?	1. Wagga Δ	1. Yes: አዎን Δ	2. No: አይደለም Δ	1. Yes: Δ	2. No: Δ
		2. Dryit Δ	1. Yes: አዎን Δ	2. No: አይደለም Δ	1. Yes: Δ	2. No: Δ
		3. Rot Rots ሮጥ ሮጥ Δ	1. Yes: አዎን Δ	2. No: አይደለም Δ	1. Yes: Δ	2. No: Δ
0		4. Other, specify… ሌላ ከሆነ ግለፁ				
	5. Did you have storage problems? የማከማጫ ችግር አለቦት?	1. Yes: Δ አዎን		2. No: Δ አይደለም (If 2, go C5:7)		
	6. What storage problem did you have? የትኛው የማከማጫ ችግር ነው ያለቦት?	1. Pest attack ምርቶ በአይጥ ወይም በነፍሳት መጠቃት	1. Yes: አዎን Δ	2. No: አይደለም Δ		
		2. Fungus ፈንገስ	1. Yes: አዎን Δ	2. No: አይደለም Δ		
		3. Pepper turned white በረበሬው ወደ ነጭ ቀለሙን ይቀይራል	1. Yes: አዎን Δ	2. No: አይደለም Δ		

0	4. Theft		ሌቦች	1. Yes: አዎን △		2. No: አይደለም △
	5. Other, specify ሌላ ከሆነ ግለጽ					

	7.Do you have transport problems? የመጓጓቆ ችግር አለቦት?		1. Yes: △ አዎን		2. No: △ አይደለም (If 2, go C5:9)	
	8. What transport problems did you have? የትኛው የመጓጓቆ ችግር ነው ያለቦት?	1. The road was inaccessible የመንገድ ችግር		1. Yes: አዎን △		2. No: አይደለም △
		2. I did not have a mode of transport ምንም አይነት መጓጓቂ የለኝም		1. Yes: አዎን △		2. No: አይደለም △
		3. Other, specify ሌላ ‹E ¨μE Î ...				

	9. How much of your harvest was affected by the above mentioned problem? (Specify problem!) N¿ ¦CEi £NYrC L°¿ Ip°d\ir v Zv pIFbpG	PROBLEM: KGS:		Where happened disease?		
				SEEDLING △	ON FIELD △	IN STORAGE △

C7	Do you allocate more than 80 % of your best fertile land to red pepper? አብዛኛውን /80%/ ጥሩ ለምነት ያለውን መሬትዎን የተጠቀሙት ለበርበሬ ነው?		1. Yes: △ አዎ (If, 1, go C9)		2. No: △ አይደለም	
C8 $	If not, to which crop do you allocate your best land? ካልሆነ፣ ለየትኛው ሰብል ነው ጥሩ ለምነት ያለውን መሬት የተጠቀሙት?	1. Maize △ በቆሎ			2. Teff △ ጤፍ	
		3. Wheat △ ስንዴ			4. Other, specify.. ሌላ ከሆነ ግለፅ	
C9 0	How do you rate the weather conditions For Red Pepper in 2001? l2001 የነበረውን የአየር ሁኔታ እንዴት ያዩታል?					
	1. Temperature የሙቀት መጠን			1. Good ጥሩ △	3. Not good △	
	2. Rainfall የዝናብ መጠን			1. Good ጥሩ △	3. Not good △	

D. FARM PRACTICE

!	LAND PREPARATION የመስክ ዝግጅት	SEWING መዝራት	GROWING ማሳደግ	HARVESTING ምርት መሰብሰብ	STORAGE + TRANSPORT ምርት rW¿^ÞYr
D1	How was your land prepared for red pepper in 2001? l2001 የምርት ዘመን ለበርበሬ ምርት ያዘጋጁትን መሬት እንዴት ነበር?	1. Good ጥሩ △ (D3)		3. Not good △	
D2	Why wasn't it prepared properly? በትክክል ለምን አላሰተካከሉትም ነበር?	1. I didn't have access to fertilizer ማዳበሪያ ማግኘት አልቻልኩም		1. Yes: △ አዎ	
		2. I didn't have enough labour to prepare the land በቂ የሰው ሀይል አልነበረኝም /መሬቱን ማስተካከል/		1. Yes: △ አዎ	
$		3. There has been insufficient rain በቂ ዝናብ አልነበረም		1. Yes: △ አዎ	
		4. Other, specify... ሌላ ከሆነ ግለፅ			
D3	Which sowing method did you use for production in 2001? l2001 የምርት ዘመን የትኛውን የመዝራት ዘዴ ተጠቀሙ ነበር?	1. I sowed a small plot, and later transplanted the seedlings to the field ቁራጭ መሬት ላይ /የችግኝ ማፍያ ቦታ/ ዘርቼ ከዚያም ወደ ዋናው መሬት ወስጄ ነው የዘራሁት △		2. I sowed directly on the field △ ቀጥታ ዋናው መሬት ላይ ነው የዘራሁት (If 2, go D5)	
D4 $	Which type of irrigation did you use for the small plot? ለቁራጭ መሬቱ /ለችግኝ ማፍያ ቦታው/ የተጠቀሙት የመስኖ አይነት የቱ ነው?	1. Well (groundwater/water pump) △ የጉድጓድ ውሀ /የከርሰምድር ውሀ/ በውሀ መሳቢያ		2. Well (collected rainwater)△ ጉድጓድ /የተከማቸ የዝናብ ውሀ/	
		3. Lake △ ሀይቅ		4. River △ ወንዝ	
		5. No Irrigation: rain fed: △			

D6	How do you qualify your **seedlings** of 2001? በ2001 የተጠቀሙብትን ዘር እንዴት ያዮታል?	1. High Δ		2. Low Δ
D7	Do you have an irrigation scheme for the main field of red pepper? በርበሬውን የሚያመርትበት ለዋናው መሬት የመስኖ እቅድ አሎት?	1. Yes: Δ አዎን		2. No: Δ የለኝም (If 2, go D9)

D8 $	Which type of irrigation do you have access to? በቀላሉ ሊያገኙ የሚ√ሉት የመስኖ አይነት የቱ ነው?	1. Well (groundwater/water pump) Δ ጉድጓድ (የከርሰ ም√ድር/ ውሀ መሳቢያ መሣሪያ)	2. Well (collected rainwater) ጉድጓድ /የተከማቸ ውሀ/ Δ
		3. Lake Δ ሀይቅ	4. River Δ ወንዝ
		5. Other, specify ሌላ ከሆነ ግለፅ	

D9 $	Do you feel you need training on the following activities? በሚከተሉት እንቅስቃሴዎች መሰልጠን ያስፈልገኛል ብለው ያስባሉ?	1. Digging በቁፋሮ	1. Yes: አዎ Δ	
		2. Shading ከለላ መስራት	1. Yes: አዎ Δ	
		3. Weeding አረም በማረም	1. Yes: አዎ Δ	
		4. Harvesting NYr I L \n\n	1. Yes: አዎ Δ	
		5. Storage NYr IMŠMu	1. Yes: አዎ Δ	
		6. Selling Process ^E b¦Ã Bªr	1. Yes: አዎ Δ	
		7. Other, specify…		

D10	Which harvesting method did you use for the production of 2001? በ2001 የትኛውን የምርት የመሰብሰብ ዘዴ ነው የተጠቀሙት?	1. I Picked the pepper one by one: Δ በርበሬውን አንድ በአንድ በመልቀም		2. I picked the whole plant at once: Δ ሁሉንም በርበሪ አንድ ግዜ ነው የሰበሰቡኩት
D11	When did you pick the pepper? መቼ ነበር ምርትን የለቀሙት?	1. When dark red Δ ጥቁር ቀይ ሲሆን	2. Mainly red Δ ከሞላ ጎደል ቀይ ሲሆን	3. Red/Green Δ ተያማ~ አረንጓዴ ሲሆን
D12	Did you need additional labour for pepper production in 2001? በ2001 የበርበX ምርት ዘመን ተጨማሪ የሰው ሀይል አስፈለገዎት ነበር?	1. Yes: Δ አዎን		2. No: Δ አላስፈለገኝም
D13	Did you hire labour? የሰው ሀይል ቀጥረው ነበር ?	1. Yes: Δ አዎን (If 1 go, D15)		2. No: Δ አልቀጠርኩም

D14 $	Why didn't you hire extra labour? ተጨማሪ የሰው ሀይል ለምን አልቀጠሩም ነበር?	1. High wage rate/labour shortage Δ ከፍተኛ የሰው ሀይል ክፍያ/ የሰው ሀይል እጥረት		2. Children are ready to work Δ ልጆቹ ለስራ ዝግጁ ስለሆኑ
		3. Other, specify ሌላ ከሆነ ግለፅ		

D15	Do you store pepper? በርበሬ ማከማቻ ውስ ያስተምባሉ?	1. Yes: Δ አዎን		2. No: አላስቀምጥም Δ (If 2, go D20)
D16	On average, for how long did you store the majority of your harvest? በአማካይ፣ አብዛኛውን የሰበሰቡትን ምርት ለምን ያህል ግዜ በማከማቻ ያስቀምጡታል?		Days:… ቀናት	

D17 $	How did you store your pepper? እንዴት ነበር ያከማቹት?	1. Filling in sack & placing in 'kot' Δ በማዳበሪያ በመሙላት j¼ F¨		2. In store/ 'gotera' Δ ጎተራ ውስጥ
		3. Inside house IIIr '1^¼ Δ		4. Basement Δ በትንሽ ቤት ውስጥ
		5. Other, specify… ሌላ ከሆነ ግለፅ		

D18	Do you share the store with other farmers? £ማከማቻ L¶s¿ ከሌላ ሰው ጋር በጋራ ነው £M¦ºd Lïr?	1. Yes: Δ አዎን		2. No: Δ አላስቀምጥም
D19	Why did you store? ለምንድን ነበር ሽከማቹት?			

D19 $	1. Expecting a higher price: ዋጋ ሊጨምር ይችላል በማለት	1. Yes: አዎን Δ	
	2. Lack of market demand: የገበያ ፍላጎት አናሳ ስለሆነ	1. Yes: አዎን Δ	
	3. Saving strategy ቁጠባ ስለሆነ	1. Yes: አዎን Δ	
	4. Transportation problem: የመጓጓዣ ችግር	1. Yes: አዎን Δ	
	5. Other, specify… ሌላ ከሆነ ግለፅ	…	

D20 $	How do you transport your product? £IYIX NYrC¿ ˆ¿¬r }´ı £Nq ¹µıś´ı	1. Sisal sack 'teka' q g Δ		2. Sisal sack 'jonia' I ´¿¦ Δ	
		3. Plastic sack (Madaberya) Δ M«IV¦		4. Basket I iYÁr Δ	
		5. Other, specify ሌላ ከሆነ ግለፅ...			

D21 O	Which of the following processes do you perform? ከሚከተሉት የተዘረዙ አካሄድ ይጠቀማሉ?	1. Do you dry your raw pepper? በርበሬ በˆˆr}p¦ ማድረት?	1. Yes: አዎን Δ	2. No: Δ አልጠቀምም (If 2, go D21:2)	
		1:1 How did you dry red pepper? IYIX ˆ¿¬r }´ı £M¦¦ªYer	1. In the sun covered ተሸፍኖ ፀሐይ ላይ IM^»rr Δ	2. In the sun uncovered]¨ˋÖ¿ ÐH¨ F¨ IM^» Δ	
		1:2 Where did you dry red pepper? IYIX £r }´ı £M¦¦ªYer	1. On the field Δ MI« F¨	2. On concrete †´ı M Δ	
		2. Do you sort the dried pepper by colour, size, etc? በመልክ & በቅርፅ በአ� መለዋር?	1. Yes: አዎን Δ	2. No: አልጠቀምም Δ	
		3. Do you clean the pepper? በርበሬውን ማፅዳት?	1. Yes: አዎን Δ	2. No: አልጠቀምም Δ	
		4. Do you grind the pepper for cash generation? በርበሬውን መፍጨት /ለገቢ ም⁴ት /?	1. Yes: አዎን Δ	2. No: አልጠቀምም Δ	
		5. Other, specify... ሌላ ከሆነ ግለፅ			

E. IMPROVEMENTS

E1	Are you looking for ways to improve your farm practise and/or red pepper crop? የእርሻ እንቅስቃሴዎ እና ወይም የበርበሬ ሰብሎ እንዲሻሻል የሚያስችል መንገ$ ˆ£ÖEµ¡ }´¡¿?	1. Yes: Δ አዎን (If 1, go E3)		2. No: Δ አልፈልግም	
E2 $	Why not? ለም⁴ ?	1. No reason NŒ¿¦r £E„N	1. Yes: አዎን Δ		
		2. Lack of time የሰአት እጥረት	1. Yes: አዎን Δ		
		3. Lack of money የገንዘብ እጥረት	1. Yes: አዎን Δ		
		4. Lack of training የስልጠና እጥረት	1. Yes: አዎን Δ		
		5. Other people deliberately obstruct my improvement efforts ባትት መሻሻል ሌሎ⁴ ስም⁴ና በ⁴ ብቅ ስለሚ;ቃወሙ	1. Yes: አዎን Δ		
		6.Other, specify ሌላ ከሆነ ግለፅ			
E3 $	What do you do to realise improvements? መሻሻልን ለማምጣት ምን እሸፈረጉ ነው?	1. I go to trainings ስልጠና እወሰዳለሁ	1. Yes: አዎን Δ		
		2. I ask for help from advisors ከአማካሪዎና እርዳታ እጠይቃለሁ /በአውቀት ዘሪ²/	1. Yes: አዎን Δ		
		3. I try to get improved seeds የተሻሻለ (ምርጎ) ዘር ለማግኘት እ⁴ራ⁴ሁ	1. Yes: አዎን Δ		
		4. I am looking for ways to cooperate with others ከሌሎ⁴ ጋር ተቀናጅ⁴ ለመስራ⁴ ፈቃደ⁴ ነኝ	1. Yes: አዎን Δ		
		5.Other, specify... ሌላ ከሆነ ግለፅ			
E4	Do you save money to invest in your farm? በእርሻዎ ላይ መዋለነዋይ ለማፍሰስ ይቆጥባሉ?	1. Yes: Δ አዎን		2. No: Δ አልቆጥብም	
E5 $	What are your plans to invest in? ጾሚጸተሱ⁴ በተዘጋው ላይ መዋለ ነዋይ ለማፍሰስ እ⁴ድ አሎ⁴?	1. Technology ዘመናዊ መሳሪያ	1. Yes: አዎን Δ	2. No: አይደለም Δ	
		2. Fertilizer ማዳበሪያ	1. Yes: አዎን Δ	2. No: አይደለም Δ	
		3. Improved seeds የተሻለ ዘር	1. Yes: አዎን Δ	2. No: አይደለም Δ	
		4. Other, specify.... ሌላ ከሆነ ግለፅ			
E6	Do you have a possibility for expansion into extra land? ተጨማሪ መሬት IM }r ˆYa¿ M^××r £MiuGIr መንገድ አለ?	1. Yes: Δ አዎን (If 1, go F1)		2. No: Δ £ለም	
E7 $	If not, why? ካለሆነ ለም⁴ ?	1. All land is already in use ሁሉም መሬት በጥቅም ላይ ስለዋለ Δ	2. The land is not for rent መሬቱ ስለማ¨ከራይ Δ	3. The rent of the land is too high ኪራዮ´ı ስለሆነ Δ	
		4. The land is of no use መሬቱ ምንም ጥቅም የለውም Δ	5. Other, specify.... ሌላ ከሆነ ግለፅ		

F. SEEDS, FERTILIZER and TOOLS

F1	Which of the following did you use for red pepper cultivation in 2001? በ2001 የበርበሬ እርሻ ላይ ከሚከተሉት የትኞቹን ተጠቀሙ ነበር?				
0	1. Insecticide ተባይ መከላከያ		1. Yes: ተጠቅሜያለሁ Δ		2. No: አልተጠቀምኩም Δ
	2. Pesticide ተባይ ማጥፊያ		1. Yes: ተጠቅሜያለሁ Δ		2. No: አልተጠቀምኩም Δ
	3. Herbicide አረም ማጥፊያ		1. Yes: ተጠቅሜያለሁ Δ		2. No: አልተጠቀምኩም Δ
	4. Fungicides ፈንገስ ማጥፊያ		1. Yes: ተጠቅሜያለሁ Δ		2. No: አልተጠቀምኩም Δ
F2	Do you use fertilizer for red pepper production? ለበርበሬ ምርት ማዳበሪያ ተጠቀሙ ነበር ? (If 1, go F4)		1. Yes: Δ ተጠቅሜያለሁ		2. No: Δ አልተጠቀምኩም
F3 **$**	Why don't you use fertilizer? ማዳበሪያ ለምንድን ነው የማይጠቀሙት?	1. I cannot afford it Δ የመግዛት አቅም የለኝም		2. I think the risk is too big to use it አስጊ ሁኔታዎች ስላሉብት የመስለኛል Δ	
		3. There is no fertilizer available የማዳበሪያ አቅርቦት የለም Δ			4. Other, specify
		(If 1,2,3,4 go F7)			
F4 **0**	What type of fertilizer? ምን አይነት ማዳበሪያ ነበር የተጠቀሙት ?	1 DAP /ዳፕ /	1. Yes: አዎን Δ		2. No: አይደለም Δ
		2 UREA /ዩሪያ/	1. Yes: አዎን Δ		2. No: አይደለም Δ
		3 Organic ብስባሽ	1. Yes: አዎን Δ		2. No: አይደለም Δ
F5	What is the source of your fertilizer? ማዳበሪያውን የሚ¦ሠኙት ከየት ነው ?	Number:… ቁጥር			
	(Put number at the question) 1: Market place 4: Ethiopian Spice Extraction Factory 7: Melkassa ከገበያ o q የኢ.ትዮ ቅመማ ቅመም ማሰሪ.ጫ ፋ-ብሪካ ከመልካሳ 2: Bureau of agriculture 5: Other Development Research centre 8: Private seed pro ducer ከግብርና ቢሮ ሌላ የልማት ምርምር ማእከል የግል ዘር አምራች 3: Own production 6: Farmer Cooperation 9: Other, specify…… በግል በማምረት ከሌላ ገበሬዎች /አርሶ አደሮች/ ሌላ ከሆነ ግለፅ				
F6	How much fertilizer did you use on your farm? PER TIMAD	DAP			
		UREA			
F6_1a	Why didn't you use more?	1. Not available Δ		2. Too expensive Δ	
		3. Other, specify Δ			
F6_1b	Did you receive the fertilizer on time for optimal production in 2001? M«IV¦ I\†p¦ E2001 NYr † „qv¦G		1. Yes: አዎን Δ	2. No: †Fµ„N Δ £d~r œ £q †E **Days delay:**	
F7	Which variety of seeds do you use? የራኛውን አይነት ዘር ነበር የተጠቀሙት?				
	1. Mareko Fana: ማሬቆ ፋና		1. Yes: አዎን Δ		2. No: አይደለም Δ
0	2. Backo Local የአገር ወስጥ ባከ		1. Yes: አዎን Δ		2. No: አይደለም Δ
	6. Don't know the name of the seeds. ባዝራት ስም አላውቅም		1. Yes: Δ አዎን		2. No: Δ አይደለም
	7. Other variety ሌF ከሆነ አብራራ		Specify… ግለጽ		
	Do you use factory pepper?				
	4. Paprika King: (melka Dima) መልካ ዲማ		1. Yes: አዎን Δ		2. No: አይደለም Δ
	3. Paprika Queen: (melka Eshet) መልካ እሸት		1. Yes: አዎን Δ		2. No: አይደለም Δ
	5. If not, Paprika King and/or Queen, why not? መልካ እሸት እና መልካ ዲማ ካልሆነ ለምን?	1. No demand ፈላጊ የለውም		1. Yes: አዎን Δ	2. No: አይደለም Δ
		2. No available seeds የዘር አቅርቦት የለም		1. Yes: አዎን Δ	2. No: አይደለም Δ
		3. Not a good price ዋጋው ጋሩ አይደለም /አያዋጣም/		1. Yes: አዎን Δ	2. No: አይደለም Δ
		4. Never heard about		1. Yes: አዎን Δ	
		Other, specify,… ሌF ከሆነ ¨µለፁ			

F8	What is the source of your seeds? (see options under question F5) ዘር የሚያገኙት ከየት ነው / F5 ላይ ካለው ምርጫ ምረጉ/		Number:... ቁጥር	
F9	How much pepper seeds did you use on your land in 2001? በ2001 ምን ያህል የበርበሬ ዘር ነው በመሬቱ ላይ የተጠቀሙት?		Kg/per timad: በኪሎ ግራም ¼M :	
F10	How do you rate the quality of the seeds? ዘሩን የጥራት መጠን እንዴት ይለኩታል?	1. Good ጥሩ Δ			2. Bad መጥፎ Δ
F11	Were your seeds treated with chemicals? ይNrsUr sY በኬሚካል ይps¶‾ }'ı?		1. Yes: አዎን Δ	2. No: Δ †¨ᵃEN
F11_1	Did you receive the seeds on time for optimal production in 2001? sY I\†p| E2001 NYr † „qv|G		1. Yes: አዎን Δ	2. No: †Fµ„N Δ £d~r œ £q †E Days delay:
F12 0	What kind of tools do you own?	1. Plough ማረሻ		1. Yes: አዎን Δ	2. No: Δ አይደለም
		2. Animal cart የእንስሳት ተጎታች ጋር		1. Yes: አዎን Δ	2. No: አይደለም Δ
		3. Hand tools (mofer, kenbar, maresha) ምፈር&ቀንበር እና ማረሻ		1. Yes: አዎን Δ	2. No: አይደለም Δ
		4. Oxen በሬዎች		1. Yes: አዎን Δ	2. No: አይደለም Δ
		5. Tractor ትራክተC		1. Yes: አዎን Δ	2. No: አይደለም Δ
		6. Combiner £ምC‑ት L\n\I‹¦ ኮምባይነC		1. Yes: አዎን Δ	2. No: አይደለም Δ
		7. Other, specify... ሌላ ከሆነ ግለፁ			

G. MARKETING RED PEPPER

G1	When do you normally receive price information on red pepper? አብዛኛው ግዜ ስለ IYIX ዋጋ ሻለውን መረጃ የሚደርሶት የት ነው?	1. While still at home ቤት እያለው Δ			2. At the market Δ በገበ¦ ቦታ
G2 0	What devices do you use to acquire price information on red pepper? ስለ ዋጋ ሻለውን መረጃ የሚሰሙብት /የሚያገኙበት/ መሣሪያ አለ?	2. Mobile phone በተንቀሳቃሽ ስልክ		1. Yes: አዎን Δ	2. No: አይደለም Δ
		3. Radio በሬድዮ		1. Yes: አዎን Δ	2. No: አይደለም Δ
G3 $	What means of transport do you normally use for transporting your product to the buyer? ምርቶን ’ደ ገቢያ ሲወስዱ አብዛኛው የሚጠቀሙት የመጓጓዣ መንገድ የቱ ነው?	1. On foot በእግር Δ	2. Carts በ¶V Δ	3. Motor vehicle Δ በሞተር ሳይክል	4. Animal Δ በእንስሳት	5.Public transport Δ በህዝብ መጓጓቆ
G4	Did you sell red pepper in 2001? በ2001 በርበሬ ሸጠው ነበር?	1. Yes: አዎን (If 1, go G6)		Δ	2. No: Δ አልሸጥኩም
G5	Why not? ለምን ?	1. I did not planted this year በዚህ አመት አGpŠGŠiN }IY		1. Yes: Δ አዎን	
	$	2. My crop was affected by disease ሰብሌ በበሽታ ተጠቅቆ ነበር		1. Yes: Δ አዎን	
		3. The crops quality was too low የNYp| ጥራት ዝቅተኛ ነበር		1. Yes: Δ አዎን	
		4.Other, specify ሌላ ከሆነ ግለፅ (If 1,2,3,4 go G15)			
G6	Did you sell your red pepper harvest in one batch in 2001? በ2001 የበርበሬ ምC ን በእንድ ዙር ነበር የሸጡት?	1. Yes: አዎን (If 1, go G8)		Δ	2. No: Δ አይደለም
G7	In how many batches did you sell? (majority) በስንት ዙር ነው የሸጡት?	Number of batches: ... በቁጥር			

G8 0	To whom did you sell red pepper in 2001 EC? የበርበሬ ምርቶን ለማን ነበር የሸጡት? 1 = First batch የመጀመሪያ ዙር 2 = Second batch ሁለተኛ ዙር 3 = Third batch	ENTERPRISE የንግድ ድርጅት	BATCH NO ዙC
		1. Market place የገበያ ቦታ NAME OF MARKET!	
		2. Small collector (Broker) ለ†}^pf \n]I‹•v ደላሎች	
		3. Farmer Cooperative ለMCIWr	
		4. ESEF ለኢ.ትዮጵያ ቅመማ ቅመም ማᵃW± ×nV‹	
		5. Miller በርበሬ ለሚፈጩ ድርጅቶች ‘ÜÄ IIsv	
		6. Retailer የችርቻር ነጋዴ	

	_^pf siY	7. Wholesaler የጅምላ ነጋዴ		
		8. Government enterprise ለመንግስት ድርጅት		
		9. Other, specify… ሌላ ከሆነ ግለፀ		
G9	How long does it take you to get to buyer number 1? የመ¯መሪያውን ገዥ ጋር ለመድረስ ምን ያህል ግዜ ይፈጅቦታል?	Measure in minutes walking:… የእግር ጉዞ በደቂቃ፡-		
G10	How did buyer 1 qualify your red pepper in 2001 on average? በ2001 አንደኛ ገዥዎ በበርበሬው NYr ¼Wr ªT± ላብ ምን አስተያየት ሰጠ /በአማካኝ/?	1. Low quality: (Foose) Δ ዝቅተኛ ጥራት	2. High quality: (Mamia) Δ ከፍተኛ ጥራት	
G11	When did you receive the payment? ክፍያዋትን የተቀበሉት መቼ ነበር?	1. Before the actual delivery of the red pepper በርበሬውን ከማቅረቤ በዋት /ትድመ ክፍያ/ Δ (If 1,2 go G13)	2. At moment of delivery ልክ ባቀረብኩበት ግዜ Δ	3. After the delivery ካስረከብኩ(ካቀረብኩ-ጋ) በኋላ Δ
G12	How many days after? ክስንት ቀናት በኋዋላ?	Days:… ቀናት		
G13	In 2001, did you sell on average for a price which is acceptable to you? በ2001 በአማካይ የሸጡበት ዋጋ መጠን በእርሶ ዘንድ ተቀባይነት ነበረው?	1. Almost Never Δ ተቀባይነት ኖሮት አያውቅም ማለት ይቻላል	2. Sometimes አንደንዴ Δ	3. Almost always Δ አብዛኛውን ግዜ ተቀባይነት አለው (If 3, go G15)
G14	If not, what reasons compelled you to sell? ካልሆነ በየትፎ ሁኔታ ተገፋፍተው /ተገደው/ ነው በማሽፈልጉት ዋጋ ሊሸጡ የቻሉት? (2 most important) $	1. Had to pay Taxes ግብር መክፈል ስላለብኝ		1. Yes: አዎን Δ
		2. Pressure of buyer የገዥዎች ጫና		1. Yes: አዎን Δ
		3. Repay Loan fertilizer £M«IV¦ ብድር ለመክፈል		1. Yes: አዎን Δ
		4. Product is perishable ምርቴ ሊበላሽ ስለሚችል		1. Yes: አዎን Δ
		5. Storage problem የማከማቻ ጣት(ኖ C)		1. Yes: አዎን Δ
		6. I have no negotiating power የማስማማት ስልጣን ስለሌለኝ		1. Yes: አዎን Δ
		Other, specify… ሌላ ከሆነ ግለፅ		
G15	Do buyers visit you at the farm? ገዥዎ /ደንበኛዎ/ በእርሻዎ ^ÙW L¼p'i ብኝቶዎት ያውቃል?	1. Yes: Δ አዎን	2. No: Δ አያውቴም	
G16	How do you rate your position in the negotiation process? በማስማማት ሂደት ላይ የእርሶ ተሳታፊ ምን ያህል ነው?	2. Good ጥሩ Δ	4. Bad መጥፎ Δ	
G17	How do you normally sell your pepper? አብዛኛውን ግዜ በርበሬውን የሚሸጡት	1. As an individual በግሉ ነው? Δ	2. With an informal group በቡድን ነው? Δ	3. With farmer association ጸገበሬዎች ማህበር C ነው? Δ

H. SERVICES

H1 0	From which institution did extensions workers come to visit you? ባለሙ¦ዎች እርስዎን ለመጎብኘት የሚመጡት ከየትኛው ድርጅት ነው ? (People from NGO's Private are also considered ext. worker!)	1. NGO: መንግስታዊ ያልሆኑ የበጎ አድራጎት ድርጅት	1. Yes: Δ አዎ	2. No: Δ አይደለም
		2. Government ከመንግስት	1. Yes: Δ አዎ	2. No: Δ አይደለም
		3. Private ከግል (If, 1,2,3 go H3)	1. Yes: Δ አዎ	2. No: Δ አይደለም
H3 0	How many times per month did you have contact with the extensions workers, from cultivation to harvest? በወር ምን ያህል ግዜ £GMr \Wp…v ¦µ„ • qG /ከ አዝመራ እስክ ምርት መሰብሰብ ባለው ወቅት/?	1. NGO መንግስታዊ ያሎት ድርጅቶች Number, …..	2. GOVERNMENT ከመንግስት Number,….	3. PRIVATE ከግል Number,…..

H5	Did you follow their advise, properly? ምክሩን Ir Œ€G ተጠቅመውበታል?	1. Yes: አዎን Δ (If 1, go H7)	2. No: Δ አልተጠቀምኩም
H6	If not, why (Name the Organisation!) ካልሆን ለምን ?	Specify,.... አብራራ:-	
H7	How do you qualify the advice received? የተተበሉትን ምክር እንዴት ያዩታል?	2. Good ጥሩ Δ	4. Bad መጥፎ Δ

H8	What else do the organisation(s) do for you? ድርጅቱ /ቶቹ/ ሌላ የሚያሽደርጉላችሁ ነገር አለ?	1. Providing fertilizer ማዳበሪያ መግዛት	1. Yes: አዎ Δ	2. No: Δ አይደለም
O		2. Providing technologies ዘመናዊ መሳሪያ በማቅረብ	1. Yes: አዎ Δ	2. No: Δ አይደለም
		3. Providing treatment for plant diseases ለተክሎች በሽታ መድሀኒት በማቅረብ	1. Yes: አዎ Δ	2. No: Δ አይደለም
		4. Other, specify ሌላ ከሆነ ግለፁ		

H9	Did you have training on red pepper production? በርበሬን †LWTr¿ በተመለከተ ስልጠና ወስተዋል?	1. Yes: Δ አዎን	2. No: Δ አልወሰታጹም
H10	Was the training helpful?	1. Yes	2. No

K. SOCIAL CAPITAL

K1	Is there a farmers cooperative/association/union for red pepper in your area? በአካባቢዎ የበርበሬ አምራች ማህበር አለ?	1. Yes: Δ አዎ	2. No: Δ የለም (K7)
K2	Are you a member? እርሶ አባል ኖት?	1. Yes: አዎ Δ (If 1, go K4)	2. No: አይደለሁም Δ

K3	Why not? ለምን?	1. I did not meet the requirements የተጠበቀብኝን ማሟላት ስላል ናልኩኝ Δ	2. I don't want to Δ ስላልፈለኩኝ
$		3. Other, specify ሌላ ከሆነ ግለፁ (If,1,2,3 go K7)	

K4	Name of cooperative/association/ union የመህበሩ ስም	Name: ስም:-	

K5	What is your role in the cooperative? ማህበሩ ውስጥ ምት ሚ አሎ'ኒ?	1. I am a member አባል ብቻ ነኝ Δ	2. I am in the board of Δ directors: የቦርድ አባል	3. I am a manager ሊቀመንበር Δ
$		4. General assembly Δ አስተባባሪ	5. In controlling committee Δ ተቆጣጣሪ ኮሚቴ	6. Other, ... ሌላ

K6	Do you feel that the cooperative is working in your benefit? ማህበሩ ለእርሶ ጥቅም የሚሰራ ይመስሎታል?	1. Yes: Δ አዎን	2. No: Δ አይደለም
K6_1	Do you sell pepper to the cooperative? IYIX NYrC¿ EMCIWr r`»EC	1. Yes: Δ †•¿	2. No: Δ †G`¼N
K7	Do you cooperate with other farmers in production of red pepper? ሌላ በርበሬ ከሚሸመርቱ ገበሬዎች ጋር ትብብር አሎት?	1. Yes: Δ አዎን	2. No: Δ ባለገም (If 2, go K8)
K7_1	With how many other farmers do you cooperate? Š^¿r µIX•v ¶Y IMCIY r\WFvAι	Number: Ie¼Y (Go, K9)	
K8	Why not? ለምን	Specify:... ግለፁ (Go K10)	

K9	What kind of things do you share? በምን በምን ትተባበራላችሁ? **O**	1. Labour በሰው ሀይል	1. Yes: አዎን Δ	2. No: አይደለም Δ
		2. Land (sharecropping) በመሬት /አብር በመዝራት/	1. Yes: አዎን Δ	2. No: አይደለም Δ
		3. Information (price) £"¶ መረጃ	1. Yes: አዎን Δ	2. No: አይደለም Δ
		4. Tools በመሳሪያ	1. Yes: አዎን Δ	2. No: አይደለም Δ
		5. Inputs (seeds, fertilizer, etc) በምርት ግብአት /ዘር, ማዳበሪያ ወዘተ/	1. Yes: አዎን Δ	2. No: አይደለም Δ
		6. Other ሌላ	1. Yes: አዎን Δ	2. No: አይደለም Δ

K10	What is your position in the community? ICnTp\lι 'ι^¼ N¿ ¿ }'ι¦E®r £^W Ya	1. Chairman Δ E¢l L¿IY	2. Religious leader የሃይማኖት መሪ Δ	3. Edir £^ Y \n]lι Δ
$		4. Elders/Mediators £†µY bM Eι Δ	5. Teacher LNCY Δ	6. Office worker £lΈZ \Wpf Δ
		7. Farmer µIX Δ	8. Other, specify EIF ‹E ¨µEÉ	

L . CREDIT ACCESS

L1	Did you need additional money to run your business in 2001? በ2001 ስራዎን ለማንቀሳቀስ ተጨማሪ ገንዘብ አስፈልጎዎት ነበር?	1. Yes: አዎን △		2. No: አያስፈልገኝም △	
L2	Did you take additional money that you needed? ያስፈለጎትን ተጨማሪ ገንዘብ አግኝተው ነበር ?	1. Yes: አዎ △		2. No: አላገኘሁም △	

L3	What was the purpose of the credit? የብድሩ አላማ ምንድን ነበር? $	1. Working capital ለስራ ማስኪያጃ		1. Yes: አዎ △
		2. Buying fertilizer ማዳበሪያ ለመግዛት		1. Yes: አዎ △
		3. Hiring labour የሰው ሀይል ለመቅጠር		1. Yes: አዎ △
		4 .Buy new technologies አ _ስ ዘመ ዊ መሳሪኽ ለመ ዛፒ		1. Yes: አዎ △
		5. To rent land መሬት ለመከራየት		1. Yes: አዎ △
		6. Pay off loans, taxes ብድርና ቀረጋ ለመክፈል		1. Yes: አዎ △
		7. Purchase animals እንስሳቶችን ለመግዛት		1. Yes: አዎ △
		8. Investments E L ″E ¿″ ¨		1. Yes: አዎ △
		9. Other, specify....... ሌላ ከሆነ ግለፁ		

L4	From whom did you receive the credit? ብድርን ከማን ነበር የወሰዱት? $	1: Relative ከዘመድ △	2: Traders ከነጋዴ △	3: Bank ከባንክ △
		4: Ngo ከመንግስት አልባ የበ አድራጎት ድርጅት △	5: Microfinance institution ከጥቃቅን እና አነስተኛ ተቋም △	6: Cooperative ከመህበር △
		7: Friends ከጉዋደኛ △	8: Informal money lender ከአራጣ አበዳሪ △	9: Other, specify...... ሌላ ከሆነ ግለፁ

M. FINAL QUESTIONS

M1	How much was your non-pepper income in the year 2001 EC? (BIRR) (farm + Non-farm activities) በ2001 ከበርበሬ ምርፒ ውጭ ያገኙት ገቢ ምን ያህል ነበር / ከግብርና እና ከግብርና ውጭ /	EXACT FIGURE:	
			12) Don't want to say △
	Do you receive remittances?	1. Yes	2. No
M2 &	Do you want to participate in a group discussion on the results of the research? የጥናቱን ውጤት በተመለከተ ለሚኗረው ስብሰባ ተሳታፊ ይሆናሉ?	Yes: አዎ 1. Abot Tirora △ 2. Kuno Alemena △ 3. Tora △	4. No: △ አልፈልግም
M3	Do you have any suggestions and, or want to say something? ማንኛውም ተጨማሪ አስተያያት አሎት ?		

Thank you very much!!!!   ANONIMITY!!!! አመሰግናለሁ!!!!

APPENDIX B. Multicollinearity

Colliniarity

		The age of the respondent	ZZNewEducation	A10OtherWork	ZZINPUTS	Minutes	Exact figure	L2TakeMon	Total farm size HA	The zone
The age of the respondent	Pearson Correlation	1	-,389**	-,122*	-,037	-,138*	-,169**	-,014	,024	,151*
	Sig. (2-tailed)		,000	,050	,553	,029	,008	,827	,698	,014
	N	263	258	260	262	249	249	231	260	263
ZZNewEducation	Pearson Correlation	-,389**	1	,144*	,103	,153*	,258**	-,043	,110	-,069
	Sig. (2-tailed)	,000		,020	,094	,015	,000	,519	,073	,258
	N	258	268	263	267	252	251	232	265	268
A10OtherWork	Pearson Correlation	-,122*	,144*	1	-,035	-,044	,045	,098	,013	-,102
	Sig. (2-tailed)	,050	,020		,567	,483	,478	,137	,839	,097
	N	260	263	268	267	253	251	233	265	268
ZZINPUTS	Pearson Correlation	-,037	,103	-,035	1	,136*	,028	,031	,034	-,425**
	Sig. (2-tailed)	,553	,094	,567		,029	,661	,636	,574	,000
	N	262	267	267	272	256	255	236	269	272
Minutes	Pearson Correlation	-,138*	,153*	-,044	,136*	1	,170**	-,023	,297**	-,100
	Sig. (2-tailed)	,029	,015	,483	,029		,008	,734	,000	,111
	N	249	252	253	256	257	243	226	254	257
Exact figure	Pearson Correlation	-,169**	,258**	,045	,028	,170**	1	,088	,339**	-,051
	Sig. (2-tailed)	,008	,000	,478	,661	,008		,185	,000	,413
	N	249	251	251	255	243	256	227	253	256
L2TakeMon	Pearson Correlation	-,014	-,043	,098	,031	-,023	,088	1	,039	-,038
	Sig. (2-tailed)	,827	,519	,137	,636	,734	,185		,550	,562
	N	231	232	233	236	226	227	237	236	237
Total farm size HA	Pearson Correlation	,024	,110	,013	,034	,297**	,339**	,039	1	-,163**

	Sig. (2-tailed)	,698	,073	,839	,574	,000	,000	,550		,007
	N	260	265	265	269	254	253	236	270	270
The zone	Pearson Correlation	,151[*]	-,069	-,102	-,425[**]	-,100	-,051	-,038	-,163[**]	1
	Sig. (2-tailed)	,014	,258	,097	,000	,111	,413	,562	,007	
	N	263	268	268	272	257	256	237	270	273

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX C. One way anova:

ANOVA

TOTAL INCOME

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3,103E8	6	5,172E7	5,294	,000
Within Groups	2,306E9	236	9770594,470		
Total	2,616E9	242			

APPENDIX D. Hetroscedesticity

Histogram

Dependent Variable: ZZgem2
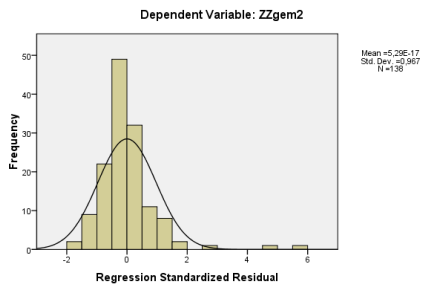
Normal P-P Plot of Regression Standardized Residual

Dependent Variable: ZZgem2

Scatterplot

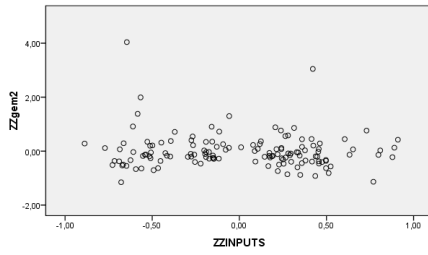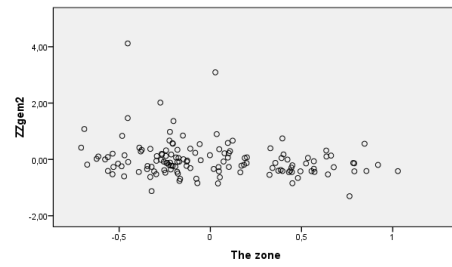Dependent Variable: ZZgem2

Partial Regression Plot

Dependent Variable: ZZgem2

Partial Regression Plot

Dependent Variable: ZZgem2

Partial Regression Plot

Dependent Variable: ZZgem2
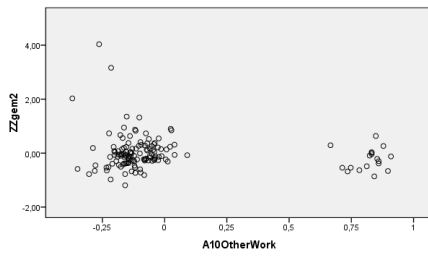
Partial Regression Plot

Dependent Variable: ZZgem2

Partial Regression Plot

Dependent Variable: ZZgem2

Partial Regression Plot

Dependent Variable: ZZgem2

Partial Regression Plot

Dependent Variable: ZZgem2

Partial Regression Plot

Dependent Variable: ZZgem2

Partial Regression Plot

Dependent Variable: ZZgem2