Perceptions and Governance of Food Insecurity Risks among Family Farmers in Southwestern Ethiopia

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Dedicated to my late son Yomiyu Getachew

Wahrnehmung und Governance von Risiken der Ernährungsunsicherheit bei kleinbäuerlichen Familienbetrieben im Südwesten Äthiopiens

Zusammenfassung

In Äthiopien sichert die Familienlandwirtschaft 81 Prozent der Bevölkerung ihren Lebensunterhalt und macht über 96 Prozent der gesamten landwirtschaftlichen Produktion aus. Diese Familienbetriebe sind jedoch häufig komplexen Bedrohungen und Risiken durch soziopolitische, ökologische, wirtschaftliche und institutionelle Rahmenbedingungen ausgesetzt, was zu ihrer strukturellen Ernährungsunsicherheit beiträgt. Hauptziel der vorliegenden Studie ist es, empirische Nachweise über Wahrnehmung und Governance der sich entwickelnden Risiken der Ernährungsunsicherheit landwirtschaftlicher Familienbetriebe in Äthiopien zu liefern. Die Studie wurde in drei Verwaltungsgebieten (Kersa, Omonada und Bako-Tibe) im Südwesten Äthiopiens zwischen Mai 2015 und April 2016 durchgeführt. Daten wurden im Form von Haushaltsumfragen, Fokusgruppendiskussionen und eingehenden Experteninterviews gesammelt. Die Datenanalyse bestand zum einen in einer thematischen Analyse qualitativer Daten und zum anderen aus deskriptiven Statistiken, darunter Hauptkomponentenanalysen, multivariater und geordneter Probitmodelle für quantitative Daten. Den theoretischen Rahmen für die Analyse und Erklärung der empirischen Ergebnisse lieferte die Evolutionäre Governance-Theorie. Die Ergebnisse der Studie offenbaren starke Pfadabhängigkeiten in der Bodenpolitik, im Agrarmarketing- und in der Kreditpolitik sowie Interdependenzen zwischen diesen Politikfeldern,. Ferner wurden Interdependenzen zwischen den unterschiedlichen Entstehungsgründen von Ernährungsunsicherheitsrisiken festgestellt, die ihre Wirkungen gegenseitig verstärken. Auch bei Entscheidungen für Strategien der Lebensunterhaltssicherung als Reaktion auf Ernährungsunsicherheitsrisiken wurden Interdependenzen beobachtet. Beispielsweise ergänzten sich Pflanzenproduktion und Nutztierhaltung mit außerlandwirtschaftlichen Einkommensstrategien. Darüber hinaus erhöht die Wahl einer Kombination aus Nutztierhaltung, außerlandwirtschaftlichen Einkommensstrategien und Transfereinkommen die Wahl der Strategien des Anbaumanagements. In Bezug auf lokalisierte Risiken schätzten unterschiedliche Akteure die gegebenen Risiken je nach eigener Perspektiven anders ein, was unterschiedliche riskscapes bildet. Zwischen diesen riskscapes können jedoch Abhängigkeiten oder Widersprüche bestehen. Zusammengefasst verdeutlicht die Analyse mit Hilfe eines evolutionary risk governance framework das Vorhandensein von Interdependenzen in verschiedenen Bereichen. Daher wird empfohlen, bei Plänen und Strategien zur Bewältigung von Risiken der Ernährungsunsicherheit ganzheitliche Ansätze in Betracht zu ziehen, um die breitere Perspektive und die Vernetzung von verschiedenen Risikofaktoren zu verstehen. Auch sollten Lehren aus dem Handeln früherer Regierungen in Äthiopien gezogen werden, um Misserfolge der Vergangenheit nicht zu

wiederholen und rechtzeitig angemessene Maßnahmen gegen ähnliche Risiken in der Zukunft zu entwickeln.

Abstract

In Ethiopia, family farming provides livelihood for 81 percent of the population, and accounts for over 96 percent of total agricultural production. However, family farmers often operate under continuous threats of complex sets of risks associated with unfavorable socio-political, ecological, economic, and institutional environments. Consequently, family farming households suffer from structural food insecurity. The major objective of this study, therefore, was to generate empirical evidence on the perception and governance of evolving food insecurity risks among family farming households in Ethiopia. The study was conducted in three *woredas* (Kersa, Omonada and Bako-Tibe) located in the southwest of the country. Data were collected in May 2015-April 2016 through household surveys, focus group discussions and in-depth interviews. Data analysis followed thematic analysis for qualitative data, and descriptive statistics, principal component analysis, multivariate and ordered probit models for quantitative data. Evolutionary governance theory provided the framework through which to analyze and explain the empirical findings. The results of the study reveal strong path dependencies in land policies, agricultural marketing, and credit policies, and interdependences among these policies putting the food security and livelihood of family farming households at stake. Interdependencies were found between different sources of food insecurity risks, with one exacerbating the effect of the other. Interdependence was also observed in the decisions made in relation to major livelihood strategies in response to food insecurity risks. For instance, crop and livestock production and livestock and off-farm income strategies complemented each other. Moreover, the choice to combine livestock, off-farm, and transfer income strategies increased the choice of crop production strategies. Regarding localized risks, different actors perceived a given risk differently from their own perspectives, forming different 'riskscapes', though there could be interdependencies or contradictions among these. In a nutshell, results of the analysis using the evolutionary risk governance framework showed the presence of dependencies in different aspects. It is thus recommended that design of plans and policies in response to food insecurity risks, consider holistic approaches to understanding the broader perspectives and interconnectedness of different sources of risk. Lessons from past governances should also be taken into consideration, in order not to repeat past failures and instead to develop appropriate and timely interventions against similar risks in the future.

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List of Acronyms

ADLI	Agricultural Development-Led Industrialization
AISCO	Agricultural Inputs Supply Corporation
AMC	Agricultural Marketing Corporation
ARDU	Arsi Rural Development Unit
BARDU	Bale-Arsi Rural Development Unit CASCAPE
BC	Before Christ
CADU	Chill Agricultural Development Unit
CASCAPE	Capacity Building for Scaling up of Evidence-based Best Practices in Agricultural Production in Ethiopia
CFS	Committee on World Food Security
COMDESKS	Community Development and Knowledge Management Project for Satiyova
CSA	Central Statistical Agency
DPPA	Disaster Prevention and Preparedness Agency
DPPC	Disaster Prevention and Preparedness Commission
DRMFS	Disaster Risk Management and Food Security Sector
EELPA	Ethiopian Electric Light and Power Authority
EGB	Ethiopian Grain Board
EGC	Ethiopian Grain Corporation
EGTE	Ethiopian Grain Trade Enterprise
EMTPS	Extension Management Training Plots
EPRDF	Ethiopian People's Revolutionary Democratic Front
ETB	Ethiopian Birr
EGT	Evolutionary Governance Theory
EPID	Extension and Project Implementation Department
ERGF	Evolutionary Risk Governance Framework

FAO	Food and Agriculture Organization
FDRE	Federal Democratic Republic of Ethiopia
FGD	Focus Group Discussion
FTF	Feed the Future
GG-I	Gilgel Gibe One
GLFV	Grey Leaf Spot Virus
GTP-I	Growth and Transformation Plan one
GTP-II	Growth and Transformation Plan two
Intr.	Interview
IPPC	Intergovernmental Panel on Climate Change
IWM	Integrated Watershed Management
KII	Key Informant Interview
MLND	Maize Lethal Necrotic Disease
MoA	Ministry of Agriculture
MoANR	Ministry of Agriculture and Natural Resources
MPP-I	Minimum Package Program one
MPP-II	Minimum Package Program two
MVP	Multivariate Probit Model
MLND	Maize Lethal Necrotic Disease
MVP	Multivariate Probit Model
NEIP	National Extension Intervention Program
no.	Number
NPDPM	National Policy for Disaster Prevention and Management
NPSDRM	National Policy and Strategy on Disaster Risk Management
PA	Peasant Association
PADEP	Peasant Agriculture Development Program
PADETES	Participatory Demonstration and Training Extension System

PASSDEP	Plan for Accelerated and Sustained Development to End Poverty
PES	Participatory Extension Program
PGE	Provisional Government of Ethiopia
PSNP	Productive Safety Net Program
RRC	Relief and Rehabilitation Commission
SIDA	Swedish International Development Agency
SDPRP	Sustainable Development and Poverty Reduction Program
SG-2000	Sasakawa Africa Association and Global 2000 for the Carter Center
SLF	Sustainable Livelihood Framework
SNNPR	Southern Nations and Nationalities and Peoples Region
T&V	Training and Visit
TLU	Tropical Livestock Unit
TVET	Technical and Vocational Education Training Center
UN	United Nations
USD	United States Dollar
WFP	World Food Program
WPE	Workers Party of Ethiopia

1. Food Insecurity Risks in Ethiopia

1.1 Introduction

In Ethiopia, family farming provides livelihood for 81 percent of the total populationand and accounts for over 96 percent of total agricultural production (CSA, 2016). Family farming is understood as "*a means of organizing agricultural, forestry, fisheries, pastoral and aquaculture production systems that are managed and operated by a family and predominantly reliant on family labor including both women's and men's*" (FAO, 2013, p.2). However, despite the immense socioeconomic changes promoting agricultural transformation in the country (Stellmacher, 2015), Ethiopian family farmers are operating under the continuous threats of complex sets of risks, as a result of often unfavorable socio-political, ecological, economic, and institutional environments (Von Braun & Olofinbiyi, 2009) and leading to hunger and structural food insecurity among these households (Dorosh & Rashid, 2012).

Since the 1960s, Ethiopia has suffered from recurrent droughts, and nearly all famines and food insecurity problems have happened in subsequent years following these events. For instance, following the regional drought that affected the Sahelian countries, Ethiopia experienced severe famines in 1973 and 1984, which resulted in a depletion of the livelihoods of households and caused excess mortality, estimated at over 250,000 people in 1973 and about one million in 1984 (Rahmato, 2009; Webb & Von Braun, 1994). Since recurrent droughts threaten at least one part of the country over short intervals (See Annex 1), Ethiopia suffers from more localized and less popularized food crises that leave millions in need of emergency food aid.

In addition to drought, other factors have contributed to a lack of resilience and the high vulnerability of victims of food insecurity. The agricultural marketing policies which were pursued by successive governments are among the most important factors in this regard (see Chapter 4), as they discouraged farmers' use of improved agricultural technologies through their effect on output and input prices (Desalegn Rahmato, 2008; Rahimato, 2009; Rashid, Getnet, & Lemma, 2010; Rashid, Negassa, & others, 2011; Webb & Von Braun, 1994). For example, market restrictions, grain supply quotas, and centrally fixed prices, which were obstacles to the inter-regional distribution of food within the country, fueled the 1984 famine (Franzel, Colburn, & Degu, 1989; Degefe & Tafesse, 1990; Rahmato, 2009). The land policies which kept land in the hands of the

Ethiopian states also played key roles in the livelihoods of smallholder family farmers and their level of vulnerability to food insecurity risk (Tecle, 1975; Rahmato, 1984, 2009; Cohen, 1987). Moreover, disregard for smallholder family farmers during successive governments re-enforced food insecurity problems. For instance, the focus of the *Dergue* government on producers' cooperatives and state farms in supply of agricultural inputs and technical backstopping contributed to poor resilience in this regard (Kassa, 2003; Besha & Park, 2014).

Family farmers' perceptions of food insecurity risks are rooted partly in how past generations and regimes addressed and managed related shocks, which makes it important to understand how the past affects the present and the future. This should enable one to draw lessons from strengths and failures of the past, in order not to repeat shortfalls in plans, policies, and strategies, and instead build on what was successful. Understanding the past in this context means looking into not only these past plans, policies and strategies, but also social organizations and administrative structures. Some of the social organizations have endured and been adapted to current situations (see Chapter 5). Some informal institutions with significant linkages to the past also deserve careful consideration, not only because of their influence on current informal institutions, but also because of their potential for uptake and influence on formal institutions (Tridico, 2004). Coherence and synergies between formal and informal institutions may also help in better understanding the governance of food insecurity risks and livelihoods faced by family farming households (Stellmacher, 2007).

Rural governance is a critical cross-cutting issue in the development discourse in general and for farming households in Ethiopia in particular. Family farmers, who make up the vast majority of the population in rural Ethiopia, are exposed to diverse sources of risk (Webb & Von Braun, 1994; Von Braun & Olofinbiyi, 2007; Bewket, 2009; Taffesse et al., 2012; Hill & Porter, 2017), and rural governance involves understanding and addressing these webs of risks. However, most of these sources of risk have become recurrent and rooted in the past. Therefore, an evolutionary dimension of risk is important in helping understand the impact of shocks (risks that affected people in the past) and management strategies taken in response to these shocks on their perception of similar risks and how they intend to manage them (see Chapter 6). Understanding family farming households' strategies in relation to food insecurity risks, and drawing important conclusions and recommendations, requires knowledge of how history and governance have

evolved, because risk management derives from risk perception and assessment, which in turn come from evolving community narratives and values. Moreover, different actors create risk, assess, and manage it in a manner that originates from a particular history in a particular location. This means that both problems and their answers are the constructs of a community.

Risk management is not only a matter of family choices, but also of larger-scale, current, and older interventions and institutions (policies and plans). Old attempts at managing risk do indeed shape family farmers' options in this regard. Moreover, their perception of risk is the result of their exposure to different types of shock (Barrett et al., 2000; Doss et al., 2008; Sulewski & Kłoczko-Gajewska, 2014). Since people behave according to their perceptions, risk assessment and their ultimate response to risks are considered for farmers the result of their risk perception. In other words, risk perception influences the choice of what livelihood strategy farmers choose, to achieve their livelihood goals (see Chapter 8), including ensuring their food security (Jansen et al., 2006; Adato and Meinzen-Dick, 2002; DFID, 1999; Ellis, 1998).

Food insecurity risk is the result of local, national, and global factors affecting the livelihoods of people in different ways. There are different layers of risk in a given space (Müller-Mahn & Everts, 2013), and different actors may understand the same source in different ways, depending on their own perspectives (see Chapter 7) – often without considering the 'real cause' of the problem. Such responses may end up creating new risks, the consequences of which might outweigh the initial source thereof. Taking this into account, Müller-Mahn & Everts (2013) suggest a holistic approach that centralizes the perspectives of local people.

The purpose of this study is to examine – from an evolutionary perspective – risk governance in rural Ethiopia in the last four regimes and reveal its implications on the livelihoods and food security of family farmers in southwestern Ethiopia. The study is based on a literature review and empirical evidence collected in the field.

1.2 Statement of the problem

Agriculture that depends mainly on family farming is the main driver of the Ethiopian economy. However, over 40 percent of the family farming households in the country are food insecure (CSA & WFP, 2014). The reasons are manifold, but the literature most often mentions consecutive droughts, policy, institutional and organizational failures, and low agricultural productivity. These factors limit the capacity of family farmers to cope with different internal and external shocks (Dorosh and Rashid, 2012; von Braun and Olofinbiyi, 2007).

A review of evolutionary paths in the last five decades in Ethiopia shows that efforts made to save lives during incidences of drought and food insecurity have varied among respective governments. For instance, the attempt made by the imperial government to 'hid the news' about the 1973 famine in northern Ethiopia caused the loss of thousands of lives, due to severe delays in emergency relief efforts (Pankhurst & Rahmato, 2013; Rahmato, 2009). The *Dergue* military government tried to address the shortfalls of the imperial regime through land reform and efforts to increase food production through state farms and producers' cooperatives (Von Braun & Olofinbiyi, 2007). However, these efforts did not bring the desired increase in food production to achieve the food-self-sufficiency objective of the government, and the 1984 famine was even worse than the crisis in the 1970s. The *Dergue* government had no better preparation except for an early warning system in place to inform the world about the situation (Rahmato, 2009; Van Uffelen, 2013). The *Dergue* government was also blamed for delays in announcing the famine in order to celebrate the 10th anniversary of the revolution and the establishment of the Workers Party of Ethiopia (WPE). The current government, under the Ethiopian People's Revolutionary Democratic Front (EPRDF), has implemented different policies and strategies to increase crop production and productivity, and to ensure 'food-self-sufficiency'. However, despite increases in crop production and large price falls in high potential areas in 1995/96 and 2002, millions of people in drought-prone areas of the country still suffer from frequent and chronic food shortages (Rashid et al., 2010). A policy objective to free the majority of beneficiaries from dependence on food aid was set after the 2003 food crisis. According to this policy objective, the country was expected to be free from foreign food aid in 2015 (MOARD, 2009). However, the most serious drought of 2015/2016 led to over 10 million people in desperate need of food aid (NDRMC, 2015). The challenge here is to understand interdependencies between the food insecurity risks that have threatened the country for over the last five decades.

As indicated in the previous paragraphs, several studies have been conducted on the cause of famines and food insecurity in Ethiopia (Devereux, 2000; Berhanu, 2001; Sisay and Tesfaye, 2003; Haile et al., 2005; Von Braun, 2007; Von Braun & Olofinbiyi, 2009; Van der veen and Tagel, 2011; Dorosh & Rashid, 2012). However, they have focused on prevailing situations and the shortcomings of existing or immediate past governments in managing the problem at hand, and none of the studies has paid due attention to the role of evolving institutions, actors, narratives, and resources in relation to these issues. In other words, there is a gap in studies linking the perceptions, assessment, and management of risk to the evolutionary perspective. The evolutionary path in the governance of food insecurity risk, and its influence on the perceptions and current actions of family farmers in terms of how they manage similar risks, has not been addressed. This study employs a mixture of approaches to capture the different dimensions of risk in addressing these problems.

1.3 Objectives of the study

The overarching objective of this study is to generate empirical evidence on the perceptions and governance of food insecurity risk among family farming households in Ethiopia.

The specific objectives are:

i. To evaluate critically the evolution of rural governance systems in the study areas.
ii. To analyze how family farming households perceive, assess, and manage different sources of food insecurity risks.
iii. To evaluate the perspectives of different actors in perception of local risks and their implications for family farmers' food security and welfare.
iv. To investigate the linkages between perceptions on sources of food insecurity risk and the choice of livelihood strategies among family farming households.
v. To contribute to the theoretical approaches used in analyzing the risk perceptions of family farmers.

1.4 Research questions

The major research question of this study is: How can the risk that family farmers faced in the past, as well as the different policies and strategies implemented in response to these shocks, the actions of different actors to overcome these shocks, and the evolving bio-physical and socio-political environment, influence family farmers' perceptions of food insecurity risk and their response strategies?

The study addresses the following specific research questions:

i. How did rural governance evolve in the study areas? What are the implications of this on the perceptions, assessment, and management of food insecurity risk among family farmers?
ii. What are the major sources of food insecurity risk to family farming households?
iii. How do family farmers perceive, assess, and manage sources of food insecurity risk?
iv. How do different actors perceive different risks? How does this influence the response of the different actors? What are the implications of such perceptions of a specified source of risk by different actors to its governance?
v. What is the impact of risk perception on the choice of livelihood strategies of family farming households?

1.5 Thesis organization

The thesis is organized into ten chapters. The introductory chapter provides the overall summary of the research so that readers can grasp the core theme of the dissertation. The introductory chapter also introduces readers to the problem statement, objectives of the study, and research questions addressed throughout the thesis. The second chapter describes the study areas and presents the design of the whole research process, including the sampling procedures, the different tools used in data collection, and methods of data analysis. The third chapter presents the conceptual and theoretical framework used in the research process, which is followed by a review of rural development policies and strategies in Chapter 4. The fifth chapter presents the evolution of rural governance, focusing on cases from three *woredas* in southwestern Ethiopia. This is followed by analysis of the perceptions and governance of food insecurity risk in Chapter 6. Chapter 7 presents the riskscapes of landlessness, food and energy insecurity, and siltation in the southwest of the

country, with special focus on the case of the Gilgel Gibe-I hydroelectricity dam. Chapter 8 presents the influence of risk perceptions on the choice of livelihood strategies. The synthesis of the theoretical contribution of this research is presented in Chapter 9. Finally, the tenth chapter presents the conclusions drawn from thesis research and makes a number of overall recommendations.

2. Methodology and Ethics

2.1.The study areas

This study is based on an empirical fieldwork conducted in three *woredas* (districts) in southwestern Ethiopia, namely Kersa and Omonada *woredas* in the Jimma zone and Bako-Tibe *woreda* in the West Shewa zone, all of which are located in Oromia Regional State (Figure 1). The three *woredas* lie in the focus area of the BIOMASWEB[1] project. Kersa and Omonada *woredas* host the reservoir for the Gilgel Gibe-I hydroelectricity dam. The other *woredas*, whose lands are located in the reservoir site of the Gilgel Gibe I hydropower project, are Sokoru and Tiro Afata. Households relocated from the reservoir site of the GG-I project in 2001 were resettled in different villages in the Kersa and Omonada *woredas*. Seven out of the nine resettlement villages are now located in Kersa *woreda*, while the remaining two villages are found in Omonada *woreda*.

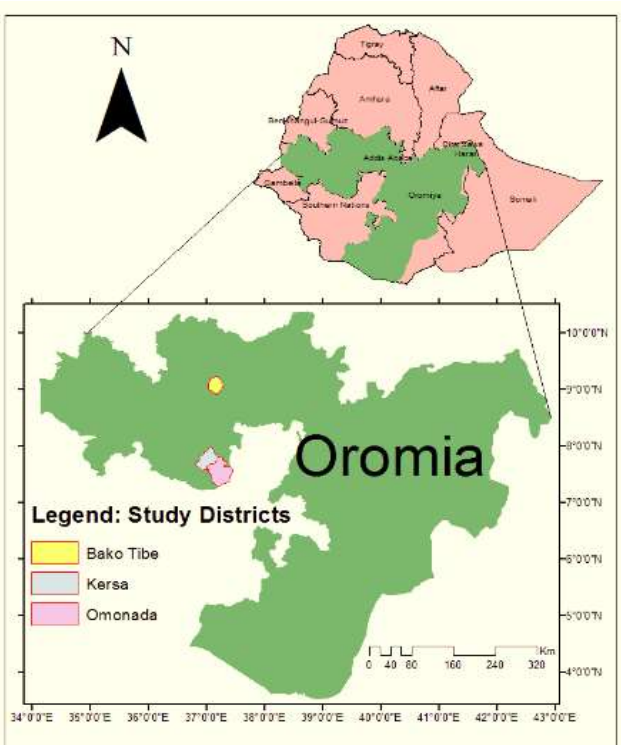


Figure 2.1: Map of the study areas

Agro-ecological zones in Ethiopia are traditionally classified into five categories, with Amharic names assigned to each one based on altitude, temperature, and rainfall amounts and

[1] This study is supported by the interdisciplinary BiomassWeb Research Project: Improving food security in Africa through increased system productivity of biomass-based value webs (BiomassWeb) at the Center for Development Research (ZEF), University of Bonn, under the work package 2.2: Family farms. (www.biomassweb.org). BiomassWeb is financed by the German Federal Ministry of Education and Research (BMBF) and the German Federal Ministry for Economic Cooperation and Development (BMZ).

distribution. These agro-ecological zones are named *berha*[2], *Kola*[3], *weinadega*[4], *dega*[5], and *wurch*[6] (Hurni, 1998). The study sites fall under three of these five agro-ecological zones. Kersa *woreda* is located between 1,740 and 2,660 meters above sea level (m.a.s.l.) and consists of 10 percent *dega* (highlands) and 90 percent *woinadega* (mid-altitude areas). Omonada is located between 880 and 3,344 m.a.s.l. and consists of 24 percent *dega*, 63 percent *woinadega*, and 13 percent *kola* (hot lowlands). The lowlands of Omonada are found in the Gibe valleys and host the reservoir for the Gilgel Gibe II and III hydroelectricity dams. The altitude of Bako-Tibe *woreda* ranges from 1,500-2,200 m.a.s.l and consists of 51 percent *kola*, 37 percent *weinadega*, and 12 percent *dega*.

The main rainy season in the Kersa and Omonada areas is from March to September. The areas receive an average annual rainfall of 900-1300 mm. Temperatures are moderate, from 20-28°C, with variations across altitudes. Bako-Tibe receives average annual rainfall of 1,266 mm, and its temperature ranges from 13-28°C.

The main language spoken in the study areas is Afan Oromo, and there is a spatial difference in the religious denomination in the study areas. In Kersa and Omonada, almost 99 percent of the sample households are Muslim, while in Bako-Tibe 75 percent are Protestants, 20 percent Orthodox Christians, and 5 percent Muslims. The average family size in the study areas is seven persons per household.

Family farmers often face labor shortages, especially during the weeding and harvesting seasons. To overcome temporary labor shortages, they use different arrangements to gain access to non-family labor. The most common labor arrangements are *dado/dugde*, *debo*, and hiring labor. *Dado/dugde* is the labor-pooling arrangement through which farmers help each other to accomplish their farming activities in groups of up to eight people on a rotational basis. *Debo* is also a labor-pooling mechanism; however, this might not be reciprocated with labor.

[2] Berha is a dry, hot area found at altitudes ranging from 500 to 1500 m.a.s.l. and receives mean annual rainfall of less than 900 mm and has an average temperature of about 22ºC.

[3] Kola is a sub-moist area found at altitudes ranging from 500 to 1500 m.a.s.l. and receives mean annual rainfall of 900-1000 mm and has an average temperature of 18-24ºC.

[4] Weinadega is a moist-cool area found at altitudes ranging from 1500 to 2300 m.a.s.l. and receives mean annual rainfall of over 1000 mm and has an average temperature of 18-20ºC.

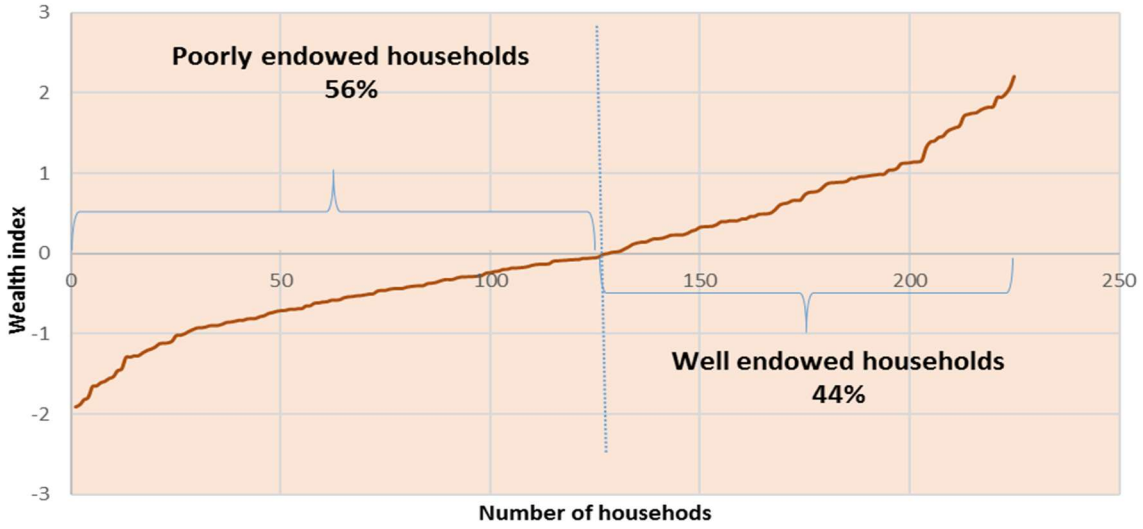
[5] Dega is a cold area found at altitudes ranging from 2300 to 3200 m.a.s.l. and receives mean annual rainfall of over 1000 mm and has an average temperature of 10-14 ºC.

[6] Wurch is a very cold or alpine area found at altitudes of over 3200 m.a.s.l. and receives mean annual rainfall of above 1000 mm and average temperatures below 10ºC.

Most houses in the study areas are built from wooden walls plastered with mud and covered with grass roofs or corrugated sheets of iron, depending on the affluence of the household. The floor is usually soil, but some well-off farmers coat the floor and the base of their houses with concrete. The most important sources of energy for rural households in the study areas are wood for fuel and kerosene for light. Fuel wood is collected either from nearby forests (if available) or crop residues (maize and sorghum stover).

Maize is the dominant crop produced in the study areas, with results from the household survey showing that this is the case in Kersa *woreda*, followed by Omonada and Bako-Tibe *woredas*, respectively, covering 74 percent, 68 percent, and 47 percent of the total cultivated land of these areas in the 2014/15 cropping season. The second most dominant crop is *Tef* (*Eragrostis tef)*, followed by sorghum, pepper, *khat (Catha edulis*), and coffee. Cattle, sheep, goats, donkeys, horses, mules, poultry, and honeybees are reared in the study areas. The average livestock holding in the study areas is 5.2 Tropical Livestock Units (TLU). Oxen are among the most important assets for Ethiopian family farmers; however, over 16 percent of the households in the study areas do not own them.

Family farming households are endowed with different assets, including physical capital, financial capital, natural capital, social capital, and human capital. Aggregation of these different types of capital can be used as a good indicator of household wealth status. However, they are measured in different ways and therefore may not be simply aggregated. With the purpose of simplifying the categorization of households according to their wealth endowment, I built a wealth index from 24 selected household wealth indicators (the five livelihood capitals), using principal component analysis following Filmer and Pritchett (1998), Zeller et al. (2003), Langyintuo et al. (2006), and Legese et al. (2011). Those households with a positive wealth index are categorized as ‘well-endowed households’, while those with a negative wealth index are categorized as ‘poorly endowed households’ (Figure 2).



Source: Computed from household survey data

Figure 2.2: Distribution of households by wealth category

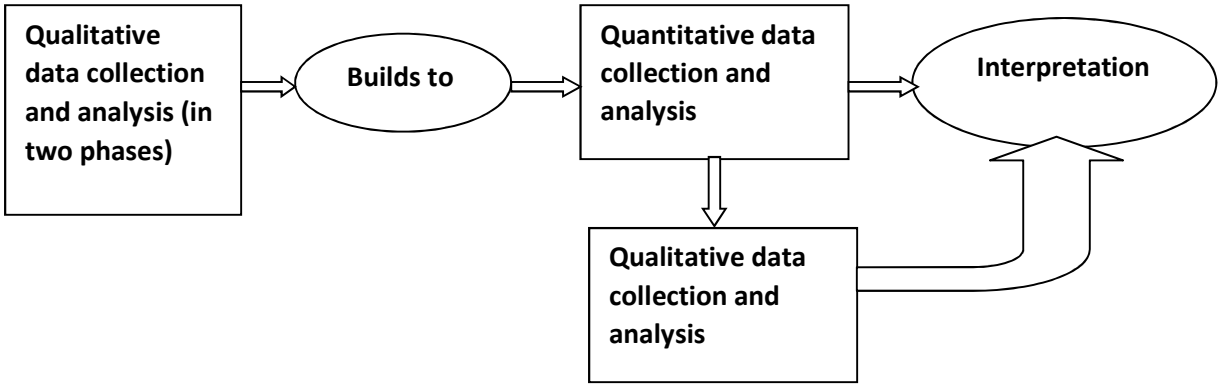
As indicated in Figure 2, about 56 percent of the farm households in the study areas can be defined as 'poorly endowed', and 44 percent as 'well-endowed' households. Evidence obtained through focus group discussions and the household survey reveals that well-endowed farmers are those that own more than a pair of oxen, cultivate their own land, and tend to receive additional parcels of cropland, either through share-cropping or informal lease (rent) from other farmers. Well-endowed farmers have better access to extension services and credit, and so they can afford to hire non-family labor and buy agriculutural inputs such as fertilizer and improved seeds for cash.

2.2. Methods of sampling and data collection

In this study, I employed a combination of techniques called the 'mixed methods' procedure (Creswell, 2014), which is defined as an intellectual and practical synthesis based on qualitative and quantitative research (Johnson et al., 2007) and involves combining these two strands and data in response to respective research questions (Creswell, 2014). Many different terms, such as integrating, synthesis, multi-method, and mixed methodology, are used to describe this approach, but recent writings tend to use the term 'mixed methods' (Johnson, 2007; Creswell, 2014 after

Bryman, 2006; Tashakkori & Teddie, 2010). Johnson (2007) reviewed the definition of the approach among leading authors in different disciplines and also suggested the use of the term. I selected this procedure because it offers a powerful third paradigm choice that often provides the most informative, complete, balanced, and useful research results (Johnson et al., 2007).

As indicated in Figure 2.3, I used the exploratory sequential mixed methods design in the collection of the primary data, which begins by exploring and analyzing qualitative data and then using these findings in the second, quantitative, phase (Creswell, 2014). The quantitative phase then builds on the results of the initial qualitative database.



Source: Creswell (2014)

Figure 2.3: Exploratory mixed methods

Following the exploratory mixed methods design, the field data collection for this study was conducted in four phases. The first phase occurred over a three-month period (May-July 2015) as an exploratory phase to understand the study setting and prepare for detailed qualitative data collection and analysis. Basically, I started the field research in Ethiopia with a visit to the relevant federal, regional, and zonal offices. During these visits, my major task was to explain the purpose of my research and seek the support of relevant authorities. Accordingly, I obtained support letters from the Oromia Bureau of Agriculture, to agricultural development offices in Jimma and West Shewa zones, which in turn did the same to *woreda* offices of agriculture. This was in order to follow proper bureaucratic procedures and avoid potential complications that may arise in the field in relation to the legitimacy of my data collection process. In addition to these support letters, I obtained some basic information on historical trends in food insecurity and government policy,

along with strategy documents from different federal and regional offices. Once I arrived at the respective *woredas*, I discussed my research topic with the heads of the *woreda* offices of agriculture and asked for their assistance in the provision of background information about the profiles of the *kebeles*[7] in their *woreda*. Since it was not possible to reach all the *kebeles* in the *woredas*, I selected potential *kebeles* for my research with the assistance of *woreda* experts and researchers from Bako Agricultural Research Center in Bako-Tibe *woreda* and a researcher from Jimma University in Kersa and Omonada *woredas*. In addition, I made a visit to the selected *kebeles* in the researchers' respective *woreda*.

During the exploratory visits, for two to three days, I had informal discussions with different individuals and groups of people to get a general overview of the areas. I also made transect walks in the *kebeles* to observe and take note of general features of the areas. The informal discussions, observations, and background information obtained from *woreda* offices helped me in the final selection of my case study *kebeles* in the three *woredas*, which were used for qualitative and quantitative data collection through a household survey.

A multi-stage random sampling procedure was used to select *kebeles*[8] from each *woreda* and farming households from each *kebele*. In the first stage, based on their maize production potential, two *woredas* from Jimma zone and one *woreda* from West Shewa zone were selected from Oromia region within the domain of the BiomassWeb project. Second, using a proportional random sampling procedure, three to six *kebeles* were selected from each *woreda*, and finally 16-24 households were randomly selected from each *kebele*. This made for a total sample of 228 family farming households in the household survey. It is difficult to get good representation of the required types of households through a random sampling procedure. As a result, the focus group and semi-structured interviews were conducted with the randomly selected households and other households not selected through this method.

After I selected the case study *kebeles*, I asked the *woreda* office heads to provide me with support letters that I could take with me to the selected *kebeles* and different offices I would be visiting for my field research. I handed these letters to the respective *kebeles* and continued with my observations and interviews. Finally, I was able to modify my interview guidelines following the informal individual and small group interviews and discussions, develop rapport with people

[7] The lowest administrative structure in Ethiopia.
[8] The lowest administrative structure in Ethiopia.

in the study areas, including extension agents, and select research assistants (one person in Bako and two in Jimma areas) for the next detailed works.

Having modified my discussion guides and semi-structured questionnaires, respectively, for the focused group discussions and key informant interviews during the first phase, I conducted these in the second phase of data collection (August-mid-October 2015). The selection of people for focus group discussions was made with the help of the research assistants, extension agents, and knowledgeable people in the area. The criteria for selection of group members were developed based on information obtained during the first phase of the data collection. The key informants were selected based on the information I obtained during the focus group discussions and with the help of knowledgeable people, extension agents, and focus group participants.

The third phase of data collection (mid-October-mid-November 2015) focused mainly on conducting the household survey. I amended the questionnaires based on information generated during the first two phases of data collection. Moreover, I repeatedly (three times) pre-tested the survey questionnaires in order to come up with a manageable option before hiring enumerators, which were selected for this study with the assistance of a CASCAPE project at Jimma University. The project staff helped me throughout the whole enumerator recruitment process, starting from announcing the position, through screening competent candidates from the large number of applicants. The selection process involved both written and oral examinations. I selected five Masters students, who were at the stage of completing their thesis work, as enumerators. I trained these enumerators for three consecutive days and finally pre-tested the questionnaire in a village near to Jimma town. I employed the same enumerators throughout the survey in the three *woredas.* The household survey was conducted over a period of one month (mid-October-mid-November 2015). Due to a series of mass protests across the Oromia region, starting from mid-November 2015, it was not possible to return to the study areas for almost four months. However, I used this as an opportunity to concentrate on data entry and data cleaning.

The fourth phase of data collection (March-April 2016) was conducted to validate some of the data collected during the first three phases and to fill the information gap during these phases. During the fourth data collection phase, I conducted in-depth interviews with 48 informants and 11 mini-focus groups (with three to five farmers in a group) involving 35 farmers. I will provide details of the data collection process and tools used in the four phases of the fieldwork in the following paragraphs.

During the entire fieldwork, I applied different tools, as indicated in Figure 2.3. The first phase involved informal individual and group discussions, observations, and transect walks in the study areas. According to Bernard (2011), informal group discussions at the beginning of field research are useful to building rapport with the local community and understanding local contexts. I conducted informal interviews with different people in rural villages, markets, churches, and mosques, as well as with farmers while they were going about their daily farming activities. These were opportunistic discussions with people whom I met in different scenarios and who were willing to talk with me. Since newcomers are usually welcome to rural Ethiopian villages, it was a matter of greeting people in their local language and getting into a discussion about general issues with respect to farming, the weather conditions, markets, natural calamities, and other shocks observed in their areas. I found it mostly smooth and easy to develop a rapport with people in most of the areas, since they readily understood me and were open to sharing their views. My knowledge of the local language and prior understanding of the culture also helped me in the process of entering into the field.

Source: Pictures taken during the fieldwork

Figure 2.4. Discussion with farmers during transect walks in Amerti Gibe *kebele*, Bako Tibe *woreda* (left) and Bulbul *kebele*, Kersa *woreda* (right)

Besides the informal discussions that I had with different people upon my arrival, I also used semi-structured interviews with individuals and groups of people gathered for their own purposes. The strategy I used in this regard was to choose places where I could get access to people. One of the convenient locations was the office of the rural *kebele* administration, as there were specific dates on which farmers gathered at the *kebele* office to discuss issues related to peace and other

community matters. The important thing in this case was to gain permission from the administrators, which I managed to do at all the locations I visited. The next step was to choose six to ten farmers from different categories. Since it was not easy to identify people or ask them directly about his/her wealth status, I relied on the *kebele* leadership, extension agents, and my field assistants. I also used groups of people gathered around churches and mosques and marketplaces as well as those who were gathered for their own purposes. In all cases, I tried to get a good representation of different types of farmer. I also had opportunities to talk to groups of extension agents that were gathered from different stations to meet with their supervisors. In total, I conducted 12 semi-structured group discussions involving 60 people.

After I developed a good rapport with the local communities and understood the overall situation in the area, I started organizing the focus group discussions. According to Krueger (1994), focus group discussions are appropriate for collecting in-depth information from past, current, or potential participants in social interactions, consumers, and victims of different shocks and different activities. Since the focus of my research was past events, shocks, and their governance, and their linkage to the present and future, I found this tool very useful to gather appropriate data for my research. The members of my focus group discussion were representatives of different farmer categories: Youth and elders, model farmers (Type A farmers), intermediate farmers (Type B farmers) and poor farmers (Type C farmers). In all study areas, I conducted male and female focus group discussions separately. I made the selection of farmers in consultation with research assistants, extension agents, and knowledgeable people in the area. Following Krueger (Krueger, 1994), I made focus group discussion with both small (3-5 farmer) and larg groups (6-10 farmer). The large focus group discussions took place during the second phase of data collection, when I was in need of diversified information from the perspective of a larger number of people. However, in the latter stage of my field research, when I was at about the saturation stage with most of the information (Onwuegbuzie, Dickinson, Leech, & Zoran, 2009), I diverted to small focus groups. I conducted small focus group discussions during the fourth phase of data collection, in order to fill the information gap from the earlier phases and clarify further any issues before the end of the fieldwork.

Source: Pictures taken during the fieldwork

Figure 2.5: Focus group discussions with women group in Omonada *woreda* (top left), Bako-Tibe *woreda* (bottom left), men groups in Kersa *woreda* (top right) and Omonada *woreda* (bottom right)

I conducted in-depth interviews throughout the four data collection phases. Indepth interviews involved interviewing different people, including knowledgeable farmers (key informants), experts, and officials in federal, regional, zonal and *woreda* government offices, the management of the Gilgel-Gibe I hydroelectricity project, *kebele* leaders, *Idir/reji* leaders, traders, extension agents, leaders of basic cooperative societies, and cooperative unions and elders. In total, I conducted in-depth interviews with 60 people throughout the one-year fieldwork in different locations. The informants were family farmers and people affiliated to different organizations located in different places, including the three study *woredas*, Addis Ababa, and the Gilgel Gibe-I project offices in Deneba and Jimma town. Accordingly, I had to travel to the respective locations of the informants, in order to conduct the interviews.

I conducted the household survey from October through November 2015. A structured questionnaire was prepared, and experienced enumerators interviewed the sampled respondents under my close supervision. The questionnaire was composed of questions focusing on household composition, education, household assets, social networks, trusts, major crops produced, inputs

use, access to credit, herd structure and size, crop and livestock marketing, income sources and expenditure, membership of different groups and organizations, land tenure, food consumption habits, exposure to different shocks during the ten years prior to the survey time, risk communication, the risk perceptions of households, and coping strategies. I also included in the questionnaire a real pay-off risk preference game, in order to capture more dimensions of the risk-taking behavior of households. As a result, the data provides a unique opportunity for the analysis requiring different household characteristics, crop, and livestock system components.

2.3.Methods of data analysis

Different data analysis methods were employed in this study. For the qualitative data, I applied the thematic analysis, "the method that involves discovering, interpreting and reporting patterns and clusters of meaning with in the data" (Ritchie, Lewis, Nicholls, & Ormston, 2003). This method enabled me to identify different themes within textual data that I collected using different approaches. These themes were re-grouped and organized into broader themes, in order to answer the key research questions (Ritchie et al., 2003; Thomas & Harden, 2008; Joffe, 2012). The transcribed data were coded into different themes (codes) and broader themes (families) using ATLAS.ti software, in order to simplify the process of analysis.

I analyzed the quantitative data using descriptive statistical tools, principal component analysis, and multivariate and ordered probit regression models. I used descriptive statistical tools throughout the study where I made use of the data from the household survey, and used principal component analysis in the construction of the wealth index in Chapter 5. The regression models were used to identify the influence of family farmers' perceptions of different risks on their choice of livelihood strategies. Detailed descriptions of these models are presented in respective chapters, where the results are discussed. I used SPSS version 24, STATA 15 and Microsoft Excel to analyze the quantitative data.

2.4. Ethical considerations in the research process

According to Berg (2001), "the social scientist should ensure that the rights, privacy and welfare of the people and communities that form the focus of their studies are respected," because social

science research delves deep into the social lives of subjects and unethical practices can harm their safety and welfare. Taking this into account, I tried to consider the principles of 'respect for autonomy', the principle of justice, and the principle of beneficence (Thompson & Chambers, 2012). The principle of respect for autonomy demands respect for the individual's right to provide informed consent to participate in research. With respect to this principle, I took due care in explaining who I was and the purpose of my research to all the subjects in my study, and I made clear their implicit right to refuse to participate in the research. I also indicated clearly the output of the research, in order to avoid unrealistic and unnecessary expectations. For those individuals who were willing to participate, they signed their names to express their informed consent. The issue of seeking the informed consent of respondents was an important section in the introductory page to the questionnaire I prepared for the household survey. I also trained the enumerators on how to approach the farmers, and it was only in rare cases that I came across farmers who refused to provide information and were therefore excluded from the sample.

Sound recording was one of the issues that needed to be done with the informed consent of the subjects. In this regard, I recorded most of the indepth interviews and group discussions after informing the subjects that I would be recording them during the entire discussion. Once I had explained why I needed to record the sound, and outlined the confidentiality of the information, I did not come across any resistance from the subjects.

I undertook extensive discussions with and made repeated visits to the rural communities and relevant experts and government officials, in order to get satisfactory evidence to answer my research questions. Some of the discussions I had with informants were very sensitive, and it was difficult to get into direct discussions, especially in the beginning, so I had to win the trust of these subjects through expressing the purpose of my research and its implications on their livelihoods and welfare. I also had to make clear the level of ethical obligation I had to protect the confidentiality of the information collected from different actors. This being the case, I respected the promises I made to the subjects of my research as much as possible in data management, data analysis, and while writing up the empirical findings. I hope the presentation of the cases throughout the empirical chapters invites policy dialogue and positive development interventions rather than negative implications for the subjects of my study, since they are entirely anonymous.

3. Concepts and Theories

This chapter presents the theoretical and conceptual framework that will serve as a foundation and guiding principle of the whole study. The initial sections of the chapter deal with basic concepts of food security and risk that will be used as building blocks for the theoretical framework. The final sections focus on the theoretical framework on which the analysis in this thesis is based.

3.1. Food security

The most recent and operational definition of food security is provided by the Committee on World Food Security (CFS, 2014, p.7), which states "*Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life*." According to this definition, the most important components of food security are food availability, access to food, and the proper utilization of food.

With respect to food availability, Webb and Von Braun (1994) note that it is a function of two key issues: Available resources and production levels. They define resources as natural, physical, and human and note that improvements in food availability can be achieved in part through improvements to these resource bases. Furthermore, improvements in educational opportunities and health services for people, responsible husbandry of the soil, water, and plants, and sustainable use of productive assets will also contribute to the capacity to improve the availability of food. The second key issue is that of production, and so improvements to both the farm and non-farm production of food and non-food products not only to improve food availability, but also to increase access to it.

Food access implies adequate resources to obtain level of appropriate food required to maintain consumption of adequate amount and nutritional level (Negin et al., 2009). In the context of food security, access is a question of whether individuals and households (nations) are able to acquire sufficient food (Maxwell & Frankenberger, 1992). Utilization indicates proper feeding patterns and appropriate health and hygiene practices, and food utilization is about "*proper biological use of food, a diet providing sufficient energy and essential nutrients, potable water and*

adequate sanitation, as well as knowledge of food preparation. Food utilization is also related to basic principles of nutrition, proper child care and illness management" (Negin et al., 2009 after USAID 1992). Health is an important element in food utilization, too, because adequate income and food intake can be converted into adequate nutrition, albeit if and only if an individual is in proper health (Webb and Von Braun, 1994).

Food security is also about the perceptions of concerned individuals or households regarding their current situation and uncertainties about the future (Wolfe and Frongillo, 2001). While the dietary intake of individuals indicates some aspects of food insecurity, such as calorific insufficiency and nutrition inadequacy, they do not show the cognitive and affective components of uncertainty (expressed as anxiety) about unacceptability of the food, or the unsustainability of its supply and access. For example, the current intake may be adequate, but food insecurity is still experienced due to concerns over future intake. Alternatively, intake may be inadequate but only temporarily, in order to protect supplies and prevent future insecurity (ibid).

3.2.Risk

Different scientific and professional disciplines have tried to define the term 'risk' in their own different ways (e.g. Hardaker, 2000; Kates and Kasperson, 1983; and Knight, 1921). However, all approaches have one common assumption, namely the distinction between reality and possibility (Zinn, 2008). Zinn argues that the concept of risk is tied to the possibility that the future event could be altered—or at least perceived to be altered—but the outcome is still *uncertain*, since the future may or may not be controlled by human activities. Some authors (e.g. Siegel and Alwang, 1999) use the terms "risk" and "uncertainty" interchangeably, while others try to make a clear distinction between the two (e.g. knight, 1921). According to Knight, risk implies numerical, objective probabilities, whereas uncertainty implies uncertain outcomes with unknown probabilities. However, these distinctions are not operative as such, since the probabilities are very rarely known.

In this study, risk is understood as exposure to uncertain events that may have unfavorable consequences on human health, life, and wellbeing, as well as the built and natural environment (Hardaker, 2000). Risk can also affect financial assets, economic investment, cultural heritage, and social institutions through its effect on the physical assets of the victims. It is important to make

clear the distinction between risk and hazards. According to Renn (2008), hazards are the internal characteristics of the risk agent (source of risk) that cause potential negative consequences, while risk is the potential effect that might happen to humans, their assets, and the environment. On a practical level, the potential effect (consequence) may happen or it may not, depending on the level of exposure of the victims to the hazard, the vulnerability of the target victims, and their level of resilience. In this case, the term 'exposure' describes the contact of the hazard-carrying agent with the subject/victim, while 'vulnerability to risk' describes the quality of being hurt or attacked by the hazard (Aven & Renn, 2010). Resilience implies the capacity of the target or subject to protect himself or the system against the consequences of exposure to the hazard or source of risk (ibid).

Risk perception refers to the intuitive/subjective judgement of the probability of a specified type of accident happening and how concerned we may be with the consequences (Slovic, 1987; Sjöberg, Moen, & Rundmo, 2004). This means perceiving risk includes evaluating the probability of the risk happening and making an intuitive judgement on the consequences of the risk factor/accident (Sjöberg et al., 2004). According to Renn (2009), risk perception is "*the result of the processing, assimilation and evaluation of the past experience of the subject or information and different narratives about risk by individuals or groups in the society.*" At the rural household or community level, risk perception is the basis for assessing the severity and consequences of risk and the management strategies taken in response to any potential risk.

3.3. The concept of risk from different perspectives

There are debates on the concept of risk, its causes, and approaches to analysis. This section focuses on the debates between positivists and constructivists on how risk should be conceptualized as well as the difference between the concepts of risk society and riskscapes in terms of their approaches to analyzing this matter.

3.3.1.Social constructivism/relativism versus realism perspectives of risk

There is a debate about whether risk should be conceptualized as an entity that has objective existence on the one hand and a social construct whose interpretation depends on the socio-cultural background of the interpreter on the other (Bradbury, 1989; Zinn, 2008). From a realist's

perspective, risk is thought of as a real event or danger that can be verified objectively, without being confused by subjective and social factors. This is applicable in actuarial, toxicology, engineering, probabilistic analysis, and economics of risk (Renn, 2008). Realists believe that individuals observe their environment, collect signals, and provide structure to their perceptions of different real events, while social constructivists/relativists consider risk as a mental model rather than a real phenomenon (Renn, 2008; Zinn, 2008). The link between risk as a mental model and reality is forged through the experience of actual harm (Renn, 2008a). According to Renn, a social constructivist's view of risk as a mental model implies differences in how people perceive different events. For instance, something that is considered a risk to one person may be considered an opportunity to another person. As a result, the ways people respond to different events vary according to their perceptions of these events. These two positions represent extremes in a spectrum of risk perspectives (Renn, 1996).

3.3.2.Risk society versus riskscapes

The risk society concept was coined by the German sociologist Ulrich Beck in 1986, in that "*the modern society has become a risk society in the sense that it is increasingly occupied with debating, preventing and managing risks that itself has produced*." Furthermore, according to Beck, in advanced modernity, the social production of wealth is accompanied by the social production of risk(Beck, 1992), and "*modernity is faced with its own destructive potential of social and technological development without having adopted adequate answers*" (Beck, 2008).

The other important concept worth mentioning at this point is that of the 'world risk society', in that "*global anticipation of global dangers and catastrophes rocks the foundations of modern societies*" (Beck, 1992, 2002, 2006, 2008; Beck, Bonss, & Lau, 2003). The world risk society concept was coined to capture global risks such as the side effects of nuclear technology, mad cow disease, avian influenza, and terrorism. These risks are the consequences of decisions made in modern societies and their global impact, regardless of national states and boundaries. According to Beck (2008), global risks have three important characteristics: Delocalization, un-calculability, and non-compensability. Global risks are delocalized in the sense that they are present everywhere (omnipresent). Un-calculability of global risk implies their consequences are un-calculable and

unknown, while the non-compensability of global risk implies the irreversible nature of its consequences, which may not be compensated in monetary terms.

According to Renn (2008), the three characteristics of global risk imply three important dimensions: The knowledge and non-knowledge created within society because of global risk, spatial variations in terms of their impact on the ultimate victims of these risks, and the inequality of the costs and benefits of the risk. Delocalization exposes the temporal, spatial, and social delocalization of global risks.The temporal delocalization shows the long-term effects of global risks. This dimension of global risks shows a lack of knowledge about the anticipated form of the danger, as well as its extent, timing, and duration. It also demonstrates the fact that non-knowledge could be greater than knowledge in relation to the impact of global risk to take precautionary measures at all levels and reduce potential dangers (Beck, 2002, 2006; Hornidge & Scholtes, 2011). Spatial delocalization of global risk displays its transcending nature beyond national bounderies and on to different nations and regions (Beck, 2006). However, in explaining the concept of spatial delocalization, Beck does not go beyond the spread of risks across nations or illustrate spatial differences in terms of the level of impact within a given sub-locality in a given country. This was rather captured by the concept of riskscapes coined by Detlef Müller-Mahn and Jonathan Everts (2013).

Riskscapes highlight the overlapping risks in a given space, along with different levels of influence on different actors in that space. Riskscapes are also about the perception of the different dimensions of risk in a given space by different actors, which varies with spaces. The theory of riskscapes asserts that while many risks appear global by their very definition, they are still embedded in particular landscapes and produce locally perceptible effects. The authors suggest using a common framework to analyze risks that happen simultaneously in one location, in order to understand better how collectively they shape life and space. Müller-Mahn and Everts (2013) argue that different actors with different perspectives can view riskscapes differently from others, and there can be a multitude of riskscapes. They explain the fact that "*riskscapes viewed by different actors from their own perspectives could partially overlap and these riskscapes are intrinsically interrelated/connected. These riskscapes could also be conflicting and may create controversial socio-spatial images of risk."* Based on this notion and earlier works of Bickerstaff and Simons (2009) and November (2004), Müller-Mahn and Evers (2013) criticize Beck's risk society, in that it has less focus on the multiplicity of risks related to the same topic and/or the

same place. They also criticize the approaches in which people from different disciplinary backgrounds and interests pick a certain aspect of risk out of the multiplicity of risks happening in one location and analyze them from their own perspective.

3.4. Evolutionary risk governance framework

In this study, I developed the concept of evolutionary risk governance framework (ERGF) based on the evolutionary governance theory (EGT) (Van Assche et al., 2013). Governance in general is usually defined as a form of coordination in taking collectively binding decisions within a certain community, involving formal and informal institutions and diverse groups of government and non-government actors (Beunen et al., 2015; Nye & Donahue, 2000; Van Assche et al., 2013). Evolutionary governance theory (EGT) is a theoretical framework for explaining governance from evolutionary perspectives (Van Assche et al., 2013). EGT considers governance and its elements as constantly changing and emphasizes the co-evolution between discourses, actors, and institutions. According to Van Assche et al. (2013), EGT offers a perspective on the ways in which institutions, markets, and societies evolve. ERGF is the application of the basic ideas and principles of EGT to the perception, assessment, and management of risks at household and community levels. Furthermore, it takes note of the fact that family farming households are exposed to several ecological and socioeconomic shocks (Suess-Reyes & Fuetsch, 2016). ERGF also underscores the fact that risk perception is the result of exposure to shocks/past risks (Gloede et al., 2015), as well as socio-cultural, historical, and political factors. These factors could be the results of the actions of global or local actors, institutions, or discourses (Figure 3.1). The perceptions and social concerns created in such a way influence the ways people assess or judge different sources of risk. Depending on the level of access to resources, the knowledge and power relation, and the prevailing institutional settings, response strategies against the different sources of risk may also follow the perception and assessment of respective sources thereof. When risk management is a matter of community governance, of collectively binding decision-making extending beyond a small circle, we speak of risk governance. If we consider governance as a set of co-evolving configurations of actors, institutions, and forms of knowledge, we speak of evolutionary risk governance. If we see governance as co-evolving governance configurations, risk governance has to be understood as evolving, too, i.e. one has to understand current perceptions- assessments-

management forms as deriving from pre-existing sets of actors, institutions, and forms of knowledge. Knowledge includes here both local and expert knowledge, knowledge structured as narrative, and knowledge subtly embedded in narratives. At the center of the evolutionary governance framework is risk communication, whereby a farmer needs information at each stage of evolving risk governance.

In communities marked with a high risk of events close to core values and pertinent to survival, risk itself is likely to become a topic of controversy and a discursive staple of governance. Both the understandings of risk and proposed responses thereto are structured by current actors in governance and in the institutional tools they own, in that both are discursive products, the result of a narrative, and are interpreted, used, and coordinated by means of other narratives. Since actors, institutions, and narratives (as forms of knowledge) co-evolve, this introduces dependencies in risk governance. This means that one cannot simply jump from one understanding to another one, from one tool or solution to a new one, just as one cannot copy 'best practice' from other places, without considering contextual issues.

In order to understand the past, which may have an influence on current and future scenarios, ERGF involves the analysis of dependencies (path dependences, interdependences, and goal dependences), power/knowledge, and actor/institution configurations.

Path dependencies refer to the legacies of the past that influence the current (North, 2005; Van Assche & Hornidge, 2015). This means the current actors, institutions, knowledge, power relations, and access to resources are influenced to some extent by their respective past. Interdependence on the governance path refers to interdependence between actors, different institutions, and actors and institutions in a governance process (Van Assche et al., 2013). Goal dependence, on the other hand, is dependence in the future. It can be considered as a shared vision among different actors and different institutions with the aim of achieving a certain common goal, which could be ensuring food security, attaining a certain level of per capita income, and so on (North, 2005; Van Assche & Hornidge, 2015).

In this study, institutions are considered a system of established and embedded social rules that structure social interactions (Hodgson, 2006). Institutions in this case can be formal, informal, or dead (Van Assche et al., 2013). "Formal institutions are the rules that are considered as the ones that are supposed to govern interaction in a given situation" (Van Assche & Hornidge, 2015).

According to North (1991), informal institutions are "social codes of conduct and socially acceptable behaviors that are transmitted through generations involving cooperation, collaborative learning and self-organization." Informal institutions are the results of an evolutionary process in which society develops its own codes of conduct, in order to overcome different challenges that may not be addressed fully by formal institutions. Tridico (2004) describes informal institutions as "carriers of history that have passed the test of historical time." According to Van Assche et al. (2013), formality is the result of power relations in a society in which the most powerful actors define the social rules of the game which should be enforced in the overall system. Formal institutions are rather "imported" from outside, while informal institutions are self-organized and intrinsic to local communities (Stellmacher, 2007). Since formality is the result of power relations, a once formal institution may turn out to be informal, and vice versa (Stellmacher, 2007; Van Assche & Hornidge, 2015).

The reality on the ground in Ethiopia shows that rural governance interplays between formal and informal institutions (Stellmacher, 2007; Stellmacher & Mollinga, 2009; Stellmacher & Nolten, 2010; Stellmacher, 2013). In rural contexts, informal institutions may play a much greater role in setting norms and social values, i.e. codes of conduct that guide social interactions and peace and stability, than in urban contexts. However, this does not mean that informal institutions are substitutes for formal institutions (ibid). In legal pluralism, they can complement each other. However, because of power relations in society, formal institutions have a high tendency to suppress their informal counterparts or actors implementing the formal institutions abusing the informal institutions. This in turn signifies the presence of several different actor-institution and power-knowledge configurations that influence local livelihoods and social interactions in rural areas. Since these configurations are the results of macro- and micro-level social and administrative structures, it is mandatory to understand social organizations and the way they have evolved over time.

The need to understand the evolution of social organizations' structures is not to give a simple name, path dependency. Instead, we need to understand how human groups have operated in the past and which 'positive' aspects have been carried over. It is also vital to understand what weaknesses have been felt in the past organization and its functioning, and how it has been reshaped in the current organization or which of these negative aspects taken from the past is still

influential. Accordingly, in order to paint a clear picture of evolving rural governances, this study (in Chapter 5) provides a brief analysis of administrative structures since pre-imperial Ethiopia (the *Gada* administration) in the study areas and up to the current government. This includes interactions between different institutions within these systems, the nature of power relations, and their implications for the current and future governance.

The ERGF considers the perceptions and understanding of global and local risks as results of evolution (Figure 3.1). In terms of the ERGF, global risks such as climate change are the results of the evolutionary process in the society that created them in the first place. The influence of global risks on family farmers also depends on the evolutionary processes within the victim's community that enhance the vulnerability of the community and individual households to such risks. Furthermore, the ERGF considers the fact that the perceptions of individual households and communities are the result of evolution of the knowledge system, in a community being shaped by the power/knowledge configuration in that society.

Additionally, the ERGF understands the local contexts in which communities operate, including social structures, institutions and actors, discourses, political and cultural settings of the society, household resources (human, natural, social, financial, and physical resources), technologies, and capabilities of family farmers from an evolutionary perspective. Due to the exposure of farmers to different shocks in the past, and the different risk management strategies in response to these different shocks, the ERGF underscores that risk governance strategies co-evolve with the different institutional and political settings the society undergoes. This means that the perceptions of individual farmers about different risks are the result of lessons acquired over time, due to their exposure to similar shocks in the past and the way these shocks were managed. Perceptions set in such a way continue to influence farmers' assessments, which in turn influence their management strategies of similar risks in the future (Figure 3.1).

Source: Own sketch based on Renn (2009)

Figure 3.1: Evolutionary risk governance framework

The risk management strategies of farmers include their 'choice of livelihood' strategies in response to perceived risks. Taking this into account, I argue that the perceptions of family farming households in Ethiopia for different risks influence their choice of different livelihood strategies. This being the case, the ERGF injects pathways of influence of risk perception of households on their choice of livelihood strategies in the sustainable livelihoods framework (SLF) (Scoones, 1998).

According to the SLF,[9] the choice of livelihood strategy is influenced mainly by a household's access to livelihood assets (Norton & Foster, 2001a; Scoones, 1998). The SLF also stresses the importance of the vulnerability context in which people's livelihoods and the availability of assets are affected by critical trends, shocks, and seasonality over which they have

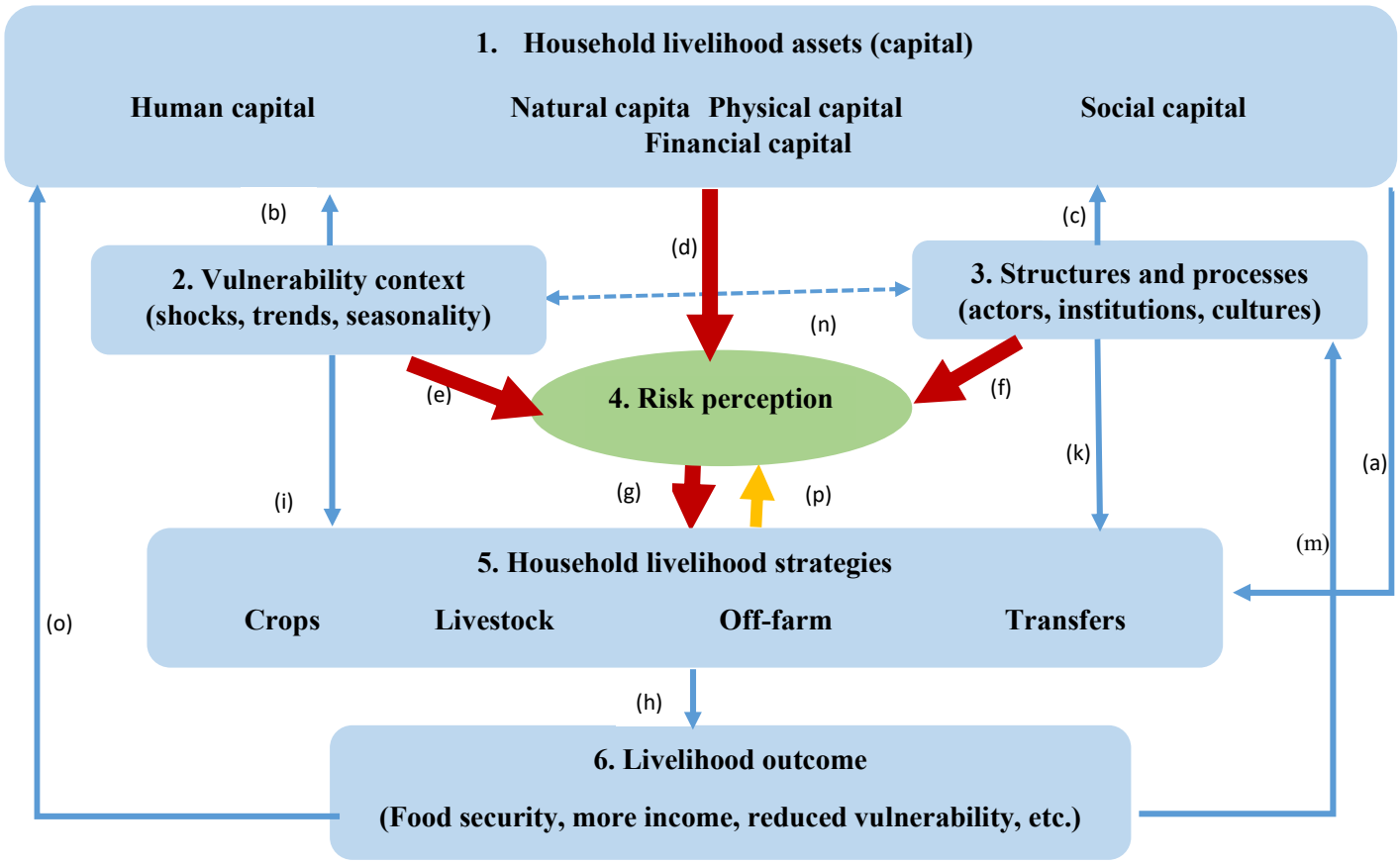
[9] The schematic outline of the SLF and its modification using ERGF are presented in Appendix 2.

limited control. The SLF underscores the role of transforming structures and processes (actors, institutions, and culture) in shaping livelihoods by determining access to different forms of capital, terms of exchange between capitals , and returns on any given livelihood strategy. However, the SLF does not indicate the role of these shocks, trends, seasonality, actors, institutions, and access to resources on the perceptions of risks that people may face and how they intend to manage these risks, including their choice of different livelihood strategies. From the ERGF perspective, I argue that trends indicated in the SLF (population trends, resource trends, national/international economic trends, governance, and technological), shocks, and seasonality form the basis of the risk perception of households. The risk perception of households in turn plays a key role in household's choice of different livelihood strategies, which form their risk management strategies, in order to achieve their livelihood outcomes, reducing food insecurity in this case.

As indicated in Figure 3.1, risk communication is at the center of the evolutionary governance process. This shows both the day-to-day communication of the perceived risk of food insecurity within the community and references to past events in terms of the historical experiences, how they were assessed, and coping strategies. The community tends to scan national, regional, and global issues to its best ability and associate them with their livelihoods and food security.

Figure 3.2 presents the conceptual framework showing how different factors influence the risk perceptions of households and the later in turn affect household's choice of livelihood strategies. The picture that I want to portray in this conceptual framework is the causality between boxes 4 (risk perception) and 5 (the choice of livelihood strategies) and their linkage to other elements of the sustainable livelihoods framework. As stipulated in the DFID's sustainable livelihoods framework, a household's choice of livelihood strategy is affected by its access to the five livelihood capital (arrow a). The vulnerability context (box 2) affects households access to this livelihood capital (arrow b), and structures and processes (box 3) affect a household's access to resources, the terms of exchange between the different forms of asset and return on the livelihood strategy (arrow c). The heart of our argument lies in risk perception (box 4). Access to resources (arrow d), exposure to different shocks (arrow e), and institutions and actors in place to mitigate the different shocks (arrow f) shape the perceptions of people over time. One of these perceptions could be about sources of food insecurity risk (box 4), which in turn influences the

choice of different livelihood strategies (arrow g), in order to achieve livelihood outcomes (arrow h). The level of achievement of livelihood outcomes at larger scale in turn endogenously influences the types of institutions and actors in place (arrow m) and the level of access these households have to capital (arrow o) (Babulo et al., 2008).



Source: Adapted from DFID's sustainable livelihood framework (Norton & Foster, 2001b)

Figure 3.2: Modified sustainable livelihoods framework from an evolutionary risk governance perspective

4. Rural development policies and strategies in Ethiopia

This chapter presents a review of rural development policies and strategies in Ethiopia since the imperial regime (1880s to 1974). The information in this chapter is used as a springboard for issues related to risk governance in subsequent chapters. Despite the fact that rural development includes all development activities, including agriculture, rural health and education services, water supply, and other rural infrastructures, this study focuses on issues related to agricultural development, such as land tenure and land use, agricultural input supply, credit and extension services, agricultural marketing, and food security policies and strategies.

4.1. Land policies and strategies during the different regimes

4.1.1. The imperial regime (1890s to 1974)

The complex land tenure system during the imperial governments of Ethiopia can be broadly categorized into the communal land tenure system, or *rist*, the 'private' tenure system, or *gult*, the church and state-owned lands (Rahmato, 1984; Rahimato, 2009; Stahl, 1974).

The rist system

Rist is a tenure system in which individual members of a community gain access to land according to their blood ties to the founding fathers of that community (Allen Hoben, 1973; Jemma, 2004; Stahl, 1974). The *rist* system was commonly practiced in the northern part of the country, including Gojam, Gondar, Tigray, Wello, and North Shewa. In the *rist* system, members of the living generation had a usage right to parcels of land they inherited from their parents, but they could not sell or use the plots to mortgage them, since actual ownership was vested in the founding father (Stahl, 1974). In return for using the land, each user was required to pay different forms of tax, including tribute and tithe (Daiel Weldegebriel, 2012). The *rist* system encouraged the extreme fragmentation of agricultural lands, since land was redistributed whenever new, legitimate kin members made a claim over the land. Consequently, tenancies were not widespread in the northern part of the country (Rahmato, 1984).

The gult system

Gult is a private form of land tenure arrangement that flourished after the expansion of the Ethiopian empire to the south during the second half of the 19th century, which involved confiscating the land holdings of native peasants and leaving them landless tenants and servants of the new landowners (Weldegebriel, 2012). Unlike the *rist* system, *gult* was not the right to hold land but the right to collect tribute from users of that land (tenants). The *gult* right was usually granted to those who provided loyal services to the crown. It was a form of salary/*maderia* or recognition for loyal services, with recipients empowered to collect taxes or tribute from people on *gult* property and to exercise administrative and judicial authority in the area (Rahmato 1984; Rahmato 2009). The *gult* estates were worked by peasants who paid tribute to use the land. The owners of the *gult* right had the right to transfer this right to their heirs but were not given the right to sell or mortgage it. However, through land grant arrangements, the imperial government granted free *gult* (which could be sold or mortgaged) in 1942 to different members of society such as the military, i.e. those who provided special services to the crown, public servants, and landless loyal citizens (Stahl, 1974).

Though gult and land obtained through the imperial land grant arrangement were known as private lands, the ultimate power over the land remained with the crown. The owner of the land exercised ownership rights as long as she/he remained loyal to the crown, even when the land was obtained through the land grant arrangement. Rahmato explains the ultimate power of the state over this land as follows:

> "*Land under private tenures was private not in the strictly capitalist but in the specifically Ethiopian term. What the state has granted and virtually all land under private tenures was originally state property. The state could take away land so far as the authority of the state was concerned, the, the latter had the right to claim land held under private ownership, and to dispossess any person or landholding institution*"(Rahmato, 1984, p.19).

Tenants were peasants that cultivated gult land on a rental basis. Rent paid by these tenants to landowners varied from one-third to two-thirds of the total production on the land according to the contribution of the landowner in terms of farm implements, inputs, and oxen. In addition to land rent, tenants were expected to pay tithe as compensation for the land tax that the landowner paid to the government and the provision of labor services (Stahl, 1974). Tenants were also

expected to visit the landowners during the holidays and provide gifts (sheep, chicken, butter, etc.). Tenants were not compensated for improving the value of their leased land by planting trees or using other conservation methods. Rather, landowners would increase the land rent because of increased fertility (ibid).

Semon/church land

Semon is the vast area of land that belonged to the Ethiopian Coptic Church during imperial times. The church distributed *semon* land to its clergies and others that supported its services (Rahmato, 1984, 2009b; Stahl, 1974), and these in turn were allowed to lease it to others. The holders of the church land could transfer their use right to their heirs but could not sell or mortgage it. The holder of the church land and their heirs continued using the church land as long as they accepted the terms of the church and continued serving it. Church land was estimated to make up 10-12 percent of the total land area in the country (Rahmato 1984, 2009).

State land

State held vast tracts of agricultural land throughout the country and especially in the southern regions. All land in the southern part of the country was state-owned before it was distributed to people in the form of *madeira*/salary or other forms (Weldegebriel, 2012). Apart from the distribution of land for political purposes, to buy support and loyalty and to threaten and discourage opposition by dispossessing and evicting them from the land, the state was the major actor in leasing to tenants (Rahmato, 1984; Stahl, 1974). This means that land during the imperial regime was used as a means to run the state machinery in two important ways. The first method involved giving out land to buy the loyalty of influential people or as recognition of the loyal service given to the crown. The state also leased out land to tenants and collected taxes on it. This means that land was the major source of state power and wealth.

Land reforms during the imperial regime and efforts at modernization

Along with the land grant arrangement, the imperial government introduced successive tax legislations in 1942 and 1944, the objectives of which were to convert in-kind taxes into cash and raise government revenue. The legislation was successful in raising some amount of tax; however, the amount did not grow as much as government expenditure, mainly because the legislation was effective only in the southern parts of the country. The church and government holdings were free from tax. However, the legislation increased the burden of the tenants, because landowners transferred the tax obligation to them (Stahl, 1974). The 1967 tax reform also failed, because the government was not able to pressurize the landlords due to the fear of losing their loyalty (Rahmato, 1984a; Rahmato, 2009; Stahl, 1974; Daiel Weldegebriel, 2012). In general, being the major owner of agricultural land on its own, and through its loyal figures, the government could not implement any land reforms because of the conflict of interest in implementing them (Weldegebriel, 2012).

As a result of the failure to implement tax reforms to collect local revenue, the government had to resort to external sources to finance its development projects in the form of loans and foreign direct investment. The government was successful in securing external financial and technical supports that were implemented through the three successive five year plans (Cohen, 1987; Stahl, 1974). The details of the plans and their controversies in agricultural development will be discussed in the next subsection.

The first and second five-year development plans

The first five-year plan (1957-1962) focused on investments in transportation, communication, electric power, manufacturing, housing, and education (Aredo, 1990; Rahmato, 2009a; Shiferaw, 2014). The strategy of this plan for agriculture focused on surveying the irrigation potential of the country's major rivers, developing a sugar factory, improving farm labor productivity on commercial farms, and stimulating the export-oriented livestock industry (Cohen, 1987). The second five-year development plan (1963-1968) gave priority to investment in manufacturing, mining, and electricity. The proposed investment in the agricultural sector during the second five-year plan was intended largely to promote commercial farming, but the plan document called for

progressive tenancy and landownership reforms acknowledging at least the major constraints hampering the development of smallholder production (Cohen, 1987).

The development of peasant agriculture was neglected in the first and second five year plans, mainly because of the prevailing theories of dual economy models which consider agriculture as a means for growth in other sectors (Aredo, 1990a; Cohen, 1987; Stommes & Sisaye, 1979; Tecle, 1975). The dual models suggest the development of large-scale commercial farms to feed the urban population, provide raw materials for industry, and release capital to other sectors through the production of export commodities. As a result, the peasant agriculture was totally overlooked. A small proportion of investment allocated to the agricultural sector during this period was allocated to development of large-scale commercial farms producing export commodities and raw materials for domestic industries. Hence, the first two development plans focused on investment in infrastructure, manufacturing and technology, and plantation agriculture (Aredo, 1990; Cohen, 1987; H. Kassa, 2008). The important point here is that the content of the plans was dictated by the prevailing global development discourses and the interests of donors, which highlights the role of actors and institutions in development governance. In this case, global actors, mainly donors and discourses, influenced the plans and guided the country's development in their own direction.

The third five-year development plan (1968-1973)

The third five-year development plan (1968-1973) saw a marked difference to the first two five-year plans, in that it recognized the importance of the agricultural sector and introduced a relatively clearer agricultural development strategy. However, this plan also continued to consider large commercial farms as key to agricultural progress (Shiferaw, 2014; Stommes & Sisaye, 1979) until donors and development partners fought hard to write into the plan that priority be given to smallholder agriculture (Cohen, 1987; Stommes & Sisaye, 1979). Thus, the shift of policy with regard to the development of smallholder agriculture was the result of i) changes in global development theories regarding the role of smallholder agriculture, ii) experience gained from implementing the first two five-year plans, and iii) changes in donor policies which resulted in pressure from development partners such as United States agencies, the World Bank and FAO

(Aredo, 1990; Cohen, 1987; Kassa, 2003). Thus, the third five-year development plan gave priority to agricultural development and tried to promote both smallholder and large commercial farming.

4.1.2. The *Dergue* regime (1974 to 1991)

Following a mass uprising, due to the repressive land tenure system, the 1973 famine, and other causes, the military junta, '*Dergue*', overthrew the imperial regime in 1974. Coming to power in the wake of mass starvation, the *Dergue* government attempted to address the issue of hunger through increased production. To achieve this aim, it introduced three important reforms aimed at state-led growth in agriculture: land reform, collectivization, and a narrow sectoral and geographical concentration of investment (Webb & Von Braun, 1994). In an attempt to respond to the basic grievances of the peasants, redistribute income, and stimulate agricultural growth, proclamation number 31 of 1975 abolished the private ownership of land, thereby granting smallholder farmers access to a maximum of 10 hectares of land under the auspices of peasant associations (PAs). The reform restricted the land market in all forms, including mortgages, and no-one was allowed to transfer land use rights to others except when the holder of the land use right (father or mother) died, in which case the children inherited it. This reform also restricted the labor market, in that no-one was allowed to hire agricultural labor except when the owner of the land use right was sick or could not accomplish any farming activities due to old age, or if widows could not accomplish the farming activity. The land proclamation also included provisions for the establishment of the PAs, which were low-level government bodies administering up to 800 hectares of land with a membership of 250 to 270 households. Some of the mandates of the PAs were to distribute land, establish marketing and service cooperatives, undertake villagization programs, and administer and conserve public properties within their area. Though land reform resolved tenant-landlord relations and ensured land use rights to millions of landless poor, it was not successful in increasing food production and eradicating famine from Ethiopia, mainly because of policies surrounding grain marketing, collectivization, and other related strategies (Stellmacher 2007; Rahmato, 2009).

4.1.3. The Current regime (1991 to present)

Land tenure policies of the current regime are more or less similar to those devised by the *Dergue* regime (Rahmato, 2004). The peculiar feature of current land policy, however, is that it is enshrined in the constitution of the country, with Article 40 stating that "Ethiopian farmers have the right to obtain land without payment and the protection against eviction from their possession." Land still belongs to the state, and peasants have only the usufruct right over land in their possession but cannot sell it or exchange it for a mortgage. The current land policy allows for the transfer of the land use right to heirs and the use of hired labor for farming activities. In addition, it maintains the periodic redistribution of land, in order to address landlessness among the younger generation. However, regional legislations limit redistribution of land to irrigable lands, and some regions like Oromia have specified that a person cannot have more than 0.5 hectares of irrigable land. Holders of a rural land use right maintain it if and only if they conserve it and continue using this land. If a land use right holder is absent from the *kebele* for more than two consecutive years, the local administration considers that she/he has willingly left the land and transfer the use right of it to other landless residents (Rahmato, 2004).

The major divergence of the current land policy from that of the *Dergue* regime is its shift towards large commercial farming. The current government supports the development of smallholder farmers through its intensive agricultural extension program. However, following the issuance of more elaborate rural policies and strategies in 2002 (EFDR, 2003), the government showed interest in expanding large commercial farming concerns. The assumption made was based on the availability of non-utilized agricultural lands in lowland areas of the country. However, when it came to implementation, the huge demands for agricultural land in the highland areas competed for plots occupied by smallholder farmers (Rahmato, 2004, 2008, 2009). As stipulated in the land legislation, the government had the right to evict holders of land user rights when a certain land was found to be more important for public services or large investments. The government issued and enacted proclamation numbers 455/2005 and 456/2005 to determine the amount of compensation to be paid to farmers, to be evicted from their holdings. However, there was a complaint that the amount of compensation was far too small and that this would endanger their livelihoods. This is believed to be one of the causes of the mass protests in the Oromia region in 2015/2016.

4.2. Agricultural extension policies during the different regimes

4.2.1. The imperial regime

The formal agricultural extension in Ethiopia was started in the early 1950s with the establishment of the Imperial Ethiopian College of Agriculture and Mechanical Arts (IECAMA, the current Haramaya University) with the assistance of the United States of America under the Point Four Program (Kassa, 2003). When the college was founded, it was given the mandate to develop and deliver a national program in agricultural extension. With the restructuring of the system and the establishment of the Ministry of Agriculture in 1963, the mandate for agricultural extension was transferred from the college to the Ministry of Agriculture (Kassa 2008). This made organizing the extension service as one of the departments in the ministry at the national level, and the ministry assigned extension agents and supervisors at the provincial level (Kassa 2003; Kassa 2008).

As mentioned above, the third five-year development plan (1968-1973) promoted the development of smallholder agriculture. However, given the limited financial and trained human resources to cover the whole country at a time, the government decided to use comprehensive package approaches. This involved promoting intensive agricultural development in strategically selected, promising areas where results could be achieved easily so that these results and technologies could be disseminated to other farmers through demonstrations and social networks (Aredo 1990; Cohen 1987; Kassa 2003).

The comprehensive package programs

The first comprehensive package program implemented in Ethiopia was the Chillalo Agricultural Development Unit (CADU), which was later expanded into the Arsi Rural Development Unit (ARDU) and finally included the Bale region and became the Bale-Arsi Rural Development Unit (BARDU). CADU started in 1967 with funding from the Swedish International Development Agency (SIDA). The major objectives of CADU and similar comprehensive package projects were to raise the real incomes of smallholders, elicit their participation and that of local government officials in rural development efforts, generate additional employment opportunities, and narrow prevailing income disparities in rural areas (Tecle, 1975). CADU was an integrated rural development program aimed at the integration of crop and livestock production, agronomic

research, the dissemination of research results, the provision of modern farm inputs, marketing and credit facilities, the development of rural infrastructure (such as roads), input supply (improved seeds and fertilizer), home economics, and the promotion of cooperative societies (Cohen, 1987). CADU was an overarching socioeconomic development designed to draw lessons for scaling out to other parts of the country. The program trained farmers through field days on demonstration plots, managed by extension agents, and through model farms (Cohen 1987; Kassa 2003; Kassa 2008). Based on the experiences of CADU, other autonomous comprehensive package projects, with varying objectives and approaches, were established during the third five-year plan period, though only CADU was fully operational until it phased out in 1986 (Kassa, 2008; Kelemework & Kassa, 2006).

The minimum package program

Based on the experiences of CADU, the imperial government of Ethiopia realized that comprehensive package programs were too costly in terms of finance and trained human resources for expansion at the national level (Kassa 2008). As a result, the first nationwide agricultural extension program, the Minimum Package Program I (MPP-I), was launched in 1971. MPP-I was prepared for the period 1971-1979 with the financial assistance of SIDA and was designed to provide smallholder farmers with services considered to be the minimum essential elements for agricultural development, including credit, marketing, and the dissemination of innovations such as improved seed, fertilizer, and the provision of extension advice (Tecle 1975; Kassa 2003; Kassa 2008). It was planned that MPP-I should cover the whole country by the end of the 1970s. Ten project areas, each addressing 10,000 households within a 10km radius of all-weather roads, were to be covered each year (Aredo, 1990). An implementation structure for MMP-I, namely the Extension and Project Implementation Department (EPID), was established in the Ministry of Agriculture. EPID had the mandate to administer both comprehensive projects and MPP-I and gradually phase out the comprehensive programs (Kassa 2003). Similar to the comprehensive packages, MPP-I used demonstration plots and model farmers to train farmers.

MPP-I established 55 minimum package areas, with 346 development centers in 280 *woredas* out of the total 580 *woredas* in the country (Mengisteab 1990). However, it failed to bring

about intended improvements in the agricultural sector because of the failure of the government to reform the restraining land tenure system, tenant-landlord relationships, and other administrative bottlenecks in government bureaucracy (Mengisteab 1990; Kassa 2003). As a result, MPP-I gave minimum attention to the livestock sector, did not benefit smallholders, and was not able to reach the vast majority of farmers (Kelemework & Kassa, 2006).

Though the government initiated the comprehensive package and minimum package projects during the third five-year plan to reach smallholder farmers, the land tenure system in place diverted the intended course of the projects, and the major clients of the extension became landlords and smallholder farmers only around the project areas (Kassa 2003; Kassa 2008). Tenants were required to provide the official land lease agreement and the consent of the landowner in order to gain access to the package projects' credit program. However, since the landlords were reluctant to take responsibility, they were not willing to provide their consent, and so this excluded smallholder peasants from accessing technology and credit facilities. As a result, the package projects benefited the landed big farmers and the landlords instead of the smallholder farmers that were the major targets of the package projects (Kassa 2008; Tecle 1975).

4.2.2. The *Dergue* regime

In 1978, the *Dergue* enacted cooperative legislation and demanded farmers be organized in service and producers' cooperatives. This shifted the focus of government interventions, including extension activities that used model individual smallholder farmers as focal points for service and producer cooperatives when introducing innovations (Kassa, 2008). The Minimum Package Program-I continued during the post-revolution period for four years, but its implementation and further expansion were constrained due to political instability, which resulted in government change and the reluctance of donors to release funds according to the schedule (Aredo, 1990). This reluctance also affected the launching of the Minimum Package Project-II (MPP-II 1981-1984), which was delayed by the World Bank for two years and finally came into action in 1981 (Kassa 2008).

Affected by the socialist ideology of the new government, MPP-II was ambitious in terms of its objectives and geographical coverage (Besha and Park 2014; Kassa 2008). It was expected

to co-ordinate various government activities, such as establishing farmers' organizations, improving crop and livestock productivity, and developing rural infrastructure in 440 *woredas* across the nation. With the advent of MPP-II, EPID was dissolved and the responsibility for coordinating extension services was given to commodity-based departments in the newly re-organized Ministry of Agriculture, such as crop production and protection, livestock production, forestry development and cooperative promotion departments. This resulted in the fragmentation of efforts, weak integration, multiple chains of command and the proliferation of administrative staff, bureaucratization, and confusion regarding the management, coordination, and supervision of extension activities (Kassa 2008). MPP-II was not successful, mainly because of a shortage of extension personnel to cover all parts of the country, budget constraints, and the overloading of extension agents with extra activities such as collecting tax and loan repayments and promoting farmers' cooperatives (Besha & Park, 2014; Kassa, 2003; Kassa, 2008).

In 1986, MPP-II phased out and replaced by a new program, the Peasant Agricultural Development Program (PADEP). PADEP classified the country into eight development zones but was successful in securing foreign funding for high potential (surplus producing) areas of northwestern Ethiopia, eastern and southeastern Ethiopia, and central Ethiopia, and was implemented in 148 *woredas* in these areas (Kassa, 2003; Kassa, 2008). PADEP used the modified Training and Visit (T&V) extension approach that was piloted in six *woredas* in 1983, based on India's experiences and adopted by MOA as an extension management system in major surplus-producing areas of the country. In this system, an extension agent was assigned to serve 1,300 households through contact farmers in surplus-producing areas, and 2,500 households in non-surplus-producing areas (Kassa, 2003; Kassa, 2008).

The major objectives of PADEP were increasing food production (at least to the level of self-sufficiency), increasing the production of cash crops for export and raw materials for domestic industries, increasing employment opportunities in rural areas, promoting rural cooperatives, and environmental protection for sustainable development. Since poor linkages between research and extension systems was considered one of the major constraints for the success of the extension work, PADEP established research-extension liaison committees at national and zonal levels in 1986 (Kelemework & Kassa, 2006). However, because of the ideological orientation of the Marxist government, PADEP gave priority to producers' cooperatives in the dissemination of

inputs and extension services, and smallholder farmers were left out (Besha & Park, 2014; Kassa, 2003).

4.2.3. The current regime

The Transitional Government of Ethiopia (TGE) adopted the Agricultural Development Led Industrialization (ADLI) as its development strategy in 1994. ADLI is the umbrella strategy, with the main goal of attaining fast and broad-based economic growth, using agriculture as the major engine of growth by generating necessary resources for industrial development. ADLI was later rationalized in the form of the Sustainable Development and Poverty Reduction Program (SDPRP), 2002/03-2004/05; a Plan for Accelerated and Sustained Development to End Poverty (PASSDEP), 2005/06-2009/10); the Growth and Transformation Plan-I (GTP-I), 2010-2015; and Growth and Transformation Plan-II (GTP-II), 2016-2020.

With regard to the extension program of the country, PADEP continued to serve for four years until ADLI was adopted, and it was replaced by a new extension program in 1995. The initiative that created the foundations for the new extension program started in 1993, when Sasakawa Africa Association and Global 2000 (SG-2000) of the Carter Center initiated a pilot extension service program on 160 farmers' maize and wheat extension management training plots (EMTPs) in Oromia and in SNNPR regional states (Kassa, 2008). The pilot EMTPs projects of SG-2000 demonstrated the possibility to double or triple maize and wheat yields through intensive input use and the proper management of crops. In 1994, the SG-2000 pilot project expanded to the Tigray and Amhara regional states, and technologies for maize, wheat, *tef*, and sorghum were demonstrated to 1,600 farmers (Kassa, 2003). The success of the SG-2000 pilot project convinced the TGE to adopt its Participatory Demonstration and Training Extension System (PADETES) as a national extension intervention program (NEIP), which was launched in 1995 (Kassa, 2003; Kassa, 2008; Kelemework & Kassa, 2006). Unlike all of the earlier extension programs implemented in Ethiopia, the government financed PADETES.

The major objectives of PADETES included increasing agricultural production to ensure food self-sufficiency, increasing the production of industrial and export crops, improving the productivity and incomes of the rural population, conserving and developing natural resources,

and empowering farmers to participate actively in the development process (Kassa, 2003). PADETES was based on the package approach promoting the research-extension and input-credit linkages (Kassa, 2003; Kassa, 2008; Kelemework & Kassa, 2006; Quiñones et al., 1997). Initially, it promoted cereal production packages in high-rainfall areas of the country, but the packages were diversified to address farmers in all agro-ecological zones over many years, with the intention of providing smallholder farmers with the menu of technology packages (ibid).

The number of participating farmers increased from 35,000 at the beginning of PADETES to 5.1 million at the end of the initiative in 2009/10 (MoANR, 2017). Understanding the fact that a shortage of extension agents would limit the success of PADETES, their training was conducted through technical and vocational education training centers (TVETs). As a result, the number of extension agents increased from 2,500 in 1995 to 55,000 in 2013 (Besha & Park, 2014). The ratio of extension agents to farmers also declined from 1:1200 in the MPP-II era to 1:120 (Kelemework & Kassa, 2006). In general, PADETES reached many farmers equitably and increased the number of participant households in extension packages, the use of fertilizer and improved seeds, and the production and productivity of grains in some areas (Davis et al., 2010). However, it is criticized for its supply-driven approach, with the majority of the packages focusing on crop production, and its narrow focus on cereals while limiting its attention to cash crops and livestock. Despite its wider coverage, the incomplete use of packages with 75 percent dis-adoption and limited participation of women farmers, is also mentioned as a limitation (ibid).

In 2010, a new extension program, known as the Participatory Extension System (PES), was introduced following the commencement of the first Growth and Transformation Plan (GTP-I). PES was a modification of PADETES in which the community was organized in one-in-five and development groups. These social organizations were pursued in the agricultural extension with the motive of ensuring the adoption of the full package of technologies through closer follow up, using a command post of experts in each *kebele* and strong social networks. Accordingly, the number of participants in the extension program increased from 5.1 million farmers at the beginning of PES in 2009/10 to 13.8 million in 2014/15(MoANR, 2017).

4.3. Agricultural marketing policies and strategies during different regimes

4.3.1.The imperial regime

During the imperial regime, markets were characterized by a high share of marketed cereals in total production, limited government intervention, and high transportation costs (Rashid & Negassa, 2012). The high share of marketed cereals during this regime was due to the land tenure system, which kept most of the land in the hands of large landlords, the church, and government authorities. Smallholders leased land from owners and paid rent in kind or cash. As a result, the marketed 'surplus' was higher than what had been observed during the other two regimes (Holmberg, 1977; Rashid & Negassa, 2012).

The imperial government established the Ethiopian Grain Board (EGB) in 1950. The EGB functioned as a regulatory body with a primary emphasis on export licensing, quality control, supervision of the marketing intelligence, and the regulation of domestic and export purchases and sales. The EGB did not hold stocks, since it was not involved in buying and selling activities. In 1960, the Ethiopian Grain Corporation (EGC) was established with the mandate to stabilize grain prices and engage in imports and exports. It was established to facilitate the grain export trade particularly, since Ethiopia was a net grain exporter up to the beginning of the 1960s (Aredo, 1990; Holmberg, 1977; Tecle, 197). The main focus of the government on the export market was indicated in a proclamation for the establishment of the corporation, which stated "EGC encourages the production of agricultural products throughout the country by providing an assured market where such products may find ready sale at prevailing world prices" (PGE, 1976). The objectives of the EGC, as stipulated in the legislation, also highlighted the intent of the government to be involved in the stabilization of grain markets. However, the EGC could not deliver fully its expected services, since it suffered from a shortage of working capital, a lack of adequate market information, and profitability problems (Rashid & Negassa, 2012).

4.3.2.The *Dergue* regime

In line with the prevailing socialist ideology, markets during the *Dergue* regime were controlled by the state. To this end, the government effected different measures to control all production and

marketing activities in the country. According to Franzel et al. (1989), drives to take control of the agricultural markets were both ideological and pragmatic. Ideologically, the state believed that traders exploited producers and urban consumers, so intervention was needed to get rid of this practice. The pragmatic aspect was the declining grain supply, which in turn resulted in higher prices for urban consumers and triggered the eventual establishment of the Agricultural Marketing Corporation (AMC) in 1976.

The principal objective of the AMC was to execute the government's policy in the fields of grain marketing, the procurement and distribution of inputs, and the maintenance of national grain reserves (The Provisional Militrary Government of Ethiopia (PGE), 1976). The corporation was responsible for handling almost all aspects of agricultural input and output markets. The import and export of agricultural products, buying and selling inputs, processing and marketing finished products for profit or otherwise also came under the umbrella of the corporation. In addition, it was given the power to construct, equip, and maintain buildings, silos, storage facilities, and other structures and machinery (PGE, 1976). In the mid-1980s, 30-40 percent of the nation's marketable surplus of all grains was purchased by the AMC (Franzel et al., 1989). This grain was supplied to state organizations and urban dwellers at prices below the prevailing price in parallel markets (ibid).

Franzel et al. (1989) indicated that AMC prices reduced farmers' incomes and their incentives to use improved inputs, and eventually decreased grain production. The pricing system also promoted the production and marketing of low-quality products, since there was no incentive to supply clean, high-quality grain to the AMC. The parallel market was also distorted, because the activity of private traders was restricted. The restriction of interregional trade limited producers' access to higher market prices, consumers' access to markets with lower grain prices, and the national economy at large (ibid). These policies also fueled the food insecurity and hunger problems of 1984 by restricting people's access to markets and the free movement of grain to areas experiencing food deficits. According to Degefe and Tafesse (1990), the development of marketing and pricing policies during the military government would be divided into the following three phases.

Phase I (1974-1979): During this period, the government tried to stabilize grain prices through a series of legislative price controls (fixing grain prices). However, the prices fixed by the

government were not attractive to producers and resulted in grain supply to the market falling below an increase in demand (Degefe & Tafesse, 1990). During this time, the AMC was competing with private traders in an open marketing system.

Phase II (1979-1987): In 1979, the government stopped relying solely on its price control system and developed a mechanism through which urban consumers would be supplied with grain at stabilized, official prices. The quota system was developed in such a way that all state farms sold their products directly to the AMC at government-established prices. Smallholder farmers were forced to sell at fixed prices to the AMC until they fulfilled the quota set for their peasant association, and thereafter they were free to sell on the free market (Franzel et al., 1989). Private traders were not allowed to move more than 100 kg of grain from one region to the other before the AMC quota in their region was fulfilled. Traders were also required to sell a proportion of their purchases to the AMC at the fixed AMC price (which was less than half of the prevailing market price) as a pre-condition to getting a permit to transport grain from region to region (Degefe & Tafesse, 1990; Franzel et al., 1989). Purchase prices for the AMC were determined centrally for all regions of the country, and they were uniform throughout the nation (Degefe and Tafesse 1990). Farmers who failed to supply their quota were not allowed to use the service cooperatives' shops (the main suppliers of non-agricultural commodities and farm inputs) and ultimately were deprived of their land use right. As a consequence of these sanctions, farmers who fail to fulfill their AMC quota from their produce bought grain from local markets and then submitted it to the AMC (Degefe & Tafesse, 1990; Franzel et al., 1989; Teferi & others, 1992).

In 1983, revision was made to the quota assignments. In the revised system, private traders were compelled to sell 50 percent of their total purchases to the AMC at fixed prices (Degefe & Tafesse, 1990). Traders were instructed to sell the stated proportion of their produce within 24 hours of their purchase, and they were not allowed to hold grain in stock beyond a specific period of time. In some places, traders were totally banned from the grain market (ibid). After some time, the quota for farmers was changed from a flat quota assignment to one that took production into account. In this system, an annual purchase plan was worked out at the center and given to the AMC as its annual purchase quota. Since the revision of market operations overlapped with the great famine of 1984, it is believed that these market regulations exacerbated the situation greatly (Franzel et al., 1989). The impact of market regulations is not only in terms of access to better

supply markets but also their contribution to decline in the livelihood of farmers and eventual entitlement failure (Sen, 1981).

Phase III (1987-1991): In 1987, because of increasing external pressure from donors, internal political pressure, worsening economic conditions, and ideological and economic policy changes in USSR and Eastern European socialist states that were its strong allies, the socialist government started to introduce changes in its grain marketing policies (Degefe & Tafesse, 1990). The AMC was restructured in 1987 by removing its mandates for the direct export of grains, the import of agricultural products, and the purchase and sale of inputs through Legal Notice 103/1987. Based on the suggestions of a task force, the government increased the price of all grains. In 1988, traders in all regions were given trade permits to move beyond the regional border as long as they submitted 50 percent of their purchases to the AMC. In 1990, the government made major reforms to the grain marketing system, including the removal of grain movement restrictions, the abolition of quota deliveries, and the elimination of the AMC's power monopoly.

4.3.3. The current regime

After a change of government in 1991, the new Ethiopian People's Revolutionary Democratic Front (EPRDF) government launched various reforms in the agricultural marketing system. One of the reforms was reorganizing and restructuring government parastatals, including the Agricultural Marketing Corporation (AMC). In 1992, the AMC was re-established as an autonomous public enterprise that operated on the open market in competition with the private sector with a new name: The Ethiopian Grain Trade Enterprise (EGTE). The mandates of the EGTE upon its reorganization included stabilizing prices, with the objectives of encouraging production and protecting consumers from price shocks, and earning foreign exchange through exporting grain to the world market. In addition, it was also expected to maintain strategic food reserves for disaster response and emergency food security operations. As per its mandate, the EGTE intervened in the maize market when prices collapsed below production costs in 1995/96 and 1996/97 (Bekele, 2002). The EGTE tried to stabilize the market by setting floor prices in 1996 and exporting 48,000 tons of maize grain in 1997. What is important to note here is that producers in high-potential areas suffered from a large decline in grain prices, which fell below production

costs, while over two million people in drought-prone areas needed emergency food aid (ibid). This means the government was involved in exporting grain from high-potential areas through the EGTE and then importing grain in the form of food aid for drought-affected areas. This demonstrated the fact that only the availability of food at national level does not guarantee food security unless there is a functioning distribution system and the buying capacity of households in the drought prone (lean market areas) attracts sellers.

The mandates of the EGTE were revised through subsequent proclamations and regulations in 1999 and 2000, which set out to allow it to withdraw gradually from price stabilization and focus on promoting exports and facilitating the development of emergency food security reserves (Rashid & Negassa, 2012). However, the move to withdraw the EGTE from its price stabilization role was not successful, because the country faced problems in 2002 when cereal prices collapsed following two consecutive bumper harvest years because of favorable weather and the adoption of improved technologies. Maize prices dropped by 80 percent in 2002, thereby making maize farming unprofitable (Rashid, Getnet, & Lemma, 2010; Rashid & Negassa, 2012). Though the EGTE withdrew from the task of market stabilization, it was ordered to procure maize in order to rescue farmers and boost their confidence. Though it was a rather late intervention, the EGTE procured some grain and then exported most of it. In the following season, the late onset of rainfall, coupled with a decreased use of modern inputs (being discouraged by price depressions), resulted in a 52 percent decrease in production (Rashid et al., 2010; Rashid & Negassa, 2012). This created food shortages that would put over 15 million people into starvation if the government and the international community did not respond by importing grain (ibid).

The EGTE faced the opposite challenge when grain prices drastically increased, from 2005 to 2008. In 2008, the government responded to the situation by taking several policy measures, including imposing an export ban on cereals, suspending domestic purchases of grain by the World Food Program (WFP), which took the strategic grain reserve to 17 percent of the targeted level and in turn put urban consumers at high risk of hunger and food insecurity, directly importing cereals through the EGTE, and reintroducing urban food rationing (Rashid et al., 2010). The EGTE started to import wheat grain in 2008 and has continued its rationing program at subsidized rates since then (Wakeyo & Lanos, 2015). The continued rationing of subsidized wheat grain to urban consumers might again be at the cost of wheat and maize producers. As explained by Demeke

(2012): “The government has succeeded in its policy of ensuring relatively lower prices for consumers who are mostly poor and often live below the poverty line. However, this achievement has come at the cost of denying adequate incentive to producers.” In the long run, farmers disincentivized to use improved inputs, because of depressed grain prices, could lead to higher prices (Kuma, 2002) and entitlement failure (Sen, 1981).

The export bans on maize have been on and off following fluctuations in domestic prices and government concerns over potential inflation. Maize exports were banned in 2008, lifted in 2010, re-imposed in 2011, and have remained in place since then (Wakeyo & Lanos, 2015). An overvalued exchange rate, the export ban on maize grain , and the distribution of imported cereals at subsidized rates at times of high food prices have kept domestic prices relatively low (Demeke, 2012). Moreover, results of monitoring and analyzing food and agricultural policies, by the FAO in 2012, revealed the disincentive of Ethiopian maize producers, in that they were taxed at an average implicit taxation rate of 32-42 percent during the period of 2005 to 2010 (Wakeyo & Lanos, 2015). This study indicated that countries that tax the agricultural sector stall both their structural change and economic reform. Reshid et al. (2010) also argued that policy interventions after the crisis in 2000 were ad hoc and shook the market actor’s confidence and diminished the effectiveness of policy interventions. The authors in this case suggested having consistent market policies in place instead of looking for ad hoc measures.

4.3.4. Input delivery system since the imperial regime

An agricultural input supply system has evolved together with the different agricultural and rural development policies of successive governments. The features of an input supply and credit service during these periods are summarized in Table 4.1.

Table 4.1: Policy regimes and development programs in agricultural input delivery system and markets, 1950s to present

Period	Intervention/event	Objective	Focus up on implementation	Remarks
1957-1967	First and Second five year development plans	Develop infrastructure and large-scale commercial farms	Establishment and expansion of large scale commercial farms	Subsistence farming was neglected
1968-1973	Third five year Development Plan (Comprehensive Integrated Package Projects)	Develop infrastructure, promote large commercial and smallholder farming. Dissemination of improved inputs (fertilizer, improved sees, improved farm tools), credit and extension; formation of cooperative societies	Both smallholder and large-scale commercial farming were targeted. Prohibitive conditions for use of credit and inputs for smallholder tenant farmers such as down payment of 25% input prices, need for 2 guarantors for tenants (or one need to be landowner), group collateral at community level	• Implementation revolved around three comprehensive extension programs that focused on high potential areas • Ultimate users of the credit and inputs were landed farmers and landlords because of the conditions associated with credit use
1971-1979	Minimum Package Program I (MPP-I)	Expand geographic coverage of the comprehensive extension programs: provide fertilizer, credit and extension to "minimum package areas."	• More areas addressed; • Applied same conditions as comprehensive packages; • Credit by the development bank was available for tenants cultivating a maximum of 20 hectares; settled previous loans and pay 25% down payment;	• Beneficiaries of the minimum package program were also the landed peasants that can pay for the down payment for input credit or those who had good relation with landowners. The latter important to get their consent as a guarantor. NB. These conditions were applied until the land reform of 1975
1978	Agricultural Marketing corporation (AMC)	Improve management of agricultural input importation, storage, and transport by handing over control of these tasks to the AMC	• All input importation and distribution became the task of AMC and the service cooperatives. Priority was given to state farms and producer cooperatives in input distribution. • High level of subsidy on fertilizer • Priority to state farmers and producers cooperatives	• The price control on outputs discouraged use of inputs because output prices fail to pay for use of modern inputs.

Period	Intervention/event	Objective	Focus up on implementation	Remarks
1980-1985	Minimum Package Program II (MPP-II)	Expand input supply and extension service coverage three-fold	• AMC was the key player in input and output marketing. MOA was distributing inputs through service cooperatives. MOA was estimating demands and overestimates were causing overstocking of fertilizer. Priority given to producer cooperatives and state farms	There was less incentive for smallholder farmers since there was centrally controlled fixed grain price and grain quota supply was based on total production per farmer
1984	Agricultural Input Supply Corporation (AISCO)	Improve the importation of fertilizer and marketing of other agricultural inputs	• AISCO was the sole importer of fertilizer	• As a successor to the AMC, AISCO was limited by lengthy bureaucratic process needed to secure foreign exchange, high freight costs, and lack of proper port facilities, high inland transport costs, inaccurate demand estimates and organizational inefficiency.
1986-1995	Peasant Agricultural Development Program (PADEP)	Provide inputs, credit, and extension services to smallholders organized into Service Cooperatives (SC) using a Training and Visit (T&V) extension approach	• Implemented only in limited high potential areas of the country, • PADEP gave high priority to producer's cooperatives and state farms neglecting smallholder farmers.	• Poor coordination because the agricultural extension activities were distributed to different commodity based departments
1991-1995	Partial liberalization of fertilizer market	Open the importation, wholesaling, and retailing of fertilizer to private companies	• Private companies such as Ethiopian Amalgamated and others entered the fertilizer import and distribution market	• Fertilizer prices remained pan-territorial and subsidized
1993-1995	Pilot Extension Management Training Plots System (EMTPS).	To demonstrate the possibility of doubling or tripling yields of maize and wheat under intensive input use and proper management.	• In 1993, pilot extension service programs were initiated on 160 farmers maize and wheat extension management plots in Oromia and SNNP regional states.	• Demonstrated on a pilot basis that yields could be doubled with application of modern inputs; • The major precondition for access to input credit was a down payment of

Period	Intervention/event	Objective	Focus up on implementation	Remarks
			• In 1994, the trial was expanded to other regions on 1600 farmers' fields. Farmers were given input credit. It was a success and the idea was taken up by the government.	25 percent of the total value of the inputs. Regional government provided guarantee to suppliers for inputs to be supplied in their regions.
1995- 2010	Participatory Demonstration and Training Extension System (PADETES) taken as National Agricultural Extension Intervention Program,	Promote improved seed-fertilizer packages (primarily for maize and wheat) through a "training and visit" approach piloted by SG- 2000. Scale up the PADETES approach to the national level as a means of boosting cereal yields and output	• The intensive use of inputs and demonstration scaled up at national level. This has shown tremendous increase in yield and served as a basis for agricultural growth.	• Efforts to scale up the PADETES approach were less successful than the piloting demonstrated by SG-2000 • Access to input credit by smallholder farmers has changed over time. Provision of input credit is taken over by micro-finance institutions where by farmers are asked to provide group collateral. This is becoming prohibitive for resource poor farmers
1997-98	Fertilizer price liberalization	Eliminate subsidies and deregulate the price of fertilizer at the wholesale and retail levels	• Elimination of fertilizer subsidies exposed farmers to high fertilizer prices which was not offset by increased grain prices for some crops	• Liberal prices have not resulted in competitive market due to the government´s continued control over marketing and credit.
2010-present	Participatory Extension System (PES) adopted as the major extension program of the country	The extension program based on the farmers development groups, one in five and social networks	• Promotion of adoption of full package of technologies using the development groups and social networks. Lead farmers, those who are willing and can afford full package of technologies are expected to play exemplary role in motivating and supporting poor farmers.	• Farmers categorized as type C farmers are resource poor farmers that could not make use of improved agricultural inputs. These farmers are those who cannot afford to pay for inputs in cash and most are not eligible to use microfinance credit.

Source: (Spielman,et al., 2009) and the author.

4.4. Food security policies and strategies during different regimes

4.4.1. The imperial regime

Up to the end of the 1950s , Ethiopia was a surplus producer and net exporter of grain (Demeke et al., 2004; Tecle, 1975). It was in 1959 that the nation received food aid for the first time in its history (Demeke et al., 2004). This was the time when Ethiopia saw the complete failure of rainfall and an outbreak of locusts that created critical shortages of food in the country. In Tigray alone, over one million people were affected by this problem, and over 100,000 of them died as a result (Bewket, 2009; Webb & Von Braun, 1994). The 1957-1959 famine was followed by a series of famines in different parts of the country in the 1960s and the famine of 1973-1974, which affected most northern parts of the country and left over a quarter of a million dead. Recurrent droughts damaged the livelihoods of people so that they lost the capacity to buy anything despite the availability of food. For instance, a study conducted by Sen (1981) in Ethiopia indicated that grain was cheaper in Wollo markets during the 1973 famine, and some amount of grain was transported to Addis Ababa and Asmara from these markets. However, the local community did not have the capacity to buy from these markets, thereby showing the fact that the major cause of the famine was an entitlement failure of people (Sen, 1981).

The imperial government hid the news of the 1973/74 famine until a BBC documentary exposed it to the world and attracted the focus of the international relief effort in mid-October 1973 (Van Uffelen, 2013). After the issue was exposed to the world, Emperor Hailesilassie issued order number 93/1966 in 1974 to establish the Relief and Rehabilitation Commission (RRC). The mandate of the RRC was to mobilize relief resources from domestic and international sources and provide emergency relief services to areas affected by drought and other disasters (Adugna, 2014). Up until the establishment of the RRC, there was no organized state response to the food insecurity crisis in the country. The 1973-74 famine was the most salient and immediate cause of the downfall of Haileselassie's government in 1974 (Aredo, 1990; Rahimato, 2009; Webb & Von Braun, 1994). Opponents of the government used the attempts of the state to hid news of the famine that claimed the lives of hundreds of thousands to effect regime change and finally dispose of the emperor.

4.4.2. The *Dergue* regime

Following the land reform of 1975, the *Dergue* military government issued more proclamations promoting the collectivization of farmers into service and producer cooperatives. State farms were also established in high-potential areas of the country. Smallholder farmers were encouraged to organize into producers' cooperatives, mainly to benefit from the preferential treatment given to these cooperatives in terms of access to inputs, technology, and extension services. With the aim of achieving food self-sufficiency, a great deal of investment was made in state farms and producers' cooperatives established in high-potential areas. As indicated earlier, minimum package programs and the PADEP were also promoted in these areas. However, all of this investment could not bring about the intended increase in food production, with per capita food supplies declining from 128 kg per head during 1961-1974, to 120 kg in 1975-1991 (Aredo, 1990; Demeke et al., 2004; Tecle, 1975).

In 1976, the Settlement Authority was established with four major objectives: i) To redress population imbalances and reduce population pressure in the highlands; ii) to increase productivity and make use of supposedly under-utilized fertile lands; iii) to provide land to those without it; and iv) to resettle pastoralists and remove unwanted urban unemployed (Pankhurst, 1990). However, this authority merged with the already existing Relief and Rehabilitation Commission (RRC) and the Awash Valley Authority to re-establish a new RRC in 1979. The new RRC resettled about 46,000 households (about 150,000 people) in different parts of the country (Rahmato, 2009). However, this resettlement program was unsuccessful in terms of both the number of households planned to be resettled and the objective of increasing productivity and thereby reducing hunger (Pankhurst, 1990; Rahmato, 2009). On the eve of the 1984 famine, these resettled households were requiring food aid.

In 1984, the cumulative impact of droughts that started at the end of 1970s in different parts of the country caused the great famine, which affected over eight million people throughout the country (Webb & Von Braun, 1994). The marketing policy of the *Dergue*, which banned the movement of grains from one region to another, grain supply quotas imposed on smallholder farmers at nationally fixed low prices, and limited grain trade operations worsened famine conditions even further (Aredo, 1990; Demeke et al., 2004; Rahimato, 2009; Rashid & Negassa, 2012; Webb & Von Braun, 1994).

Following the path of its predecessor, the *Dergue* military government also responded to the 1984 famine very late through the RRC's 'early warning' system and called for international assistance in May and announcement of the famine situation in October of same year (Jean, 2008). Despite the massive inflow of international relief through the Live Aid series of concerts, over 800,000 people died through starvation and famine-related disease (Pankhurst & Rahmato, 2013; Webb & Von Braun, 1994).

One of the government interventions in the 1984 famine was to move households that were living in drought-prone areas to high-potential agricultural areas. The government considered resettlement as a mechanism to address the root causes of famine, on the one hand, and an opportunity to implement its collectivization policy, on the other (Pankhurst, 1990). The resettlement operation was planned in haste to relocate 1.5 million households over a period of two years and started in October 1984. By March 1986, the program had moved 200,000 households (600,000 people), mainly from the northern highlands, to settlement sites in Wellega, Elubabor, and Gojam (Pankhurst & Rahmato, 2013; Webb & Von Braun, 1994). Since the RRC did not have the capacity to coordinate such a massive program, the resettlement program was planned and coordinated with a committee composed of ministers, the RRC and relevant organizations, and high government officials.

The role of the RRC in providing relief and rehabilitation services during the 1984 famine was limited to the early warning that alerted UN agencies and donor communities (Abebe, 2009), because it did not have a preparedness plan by the time the famine occurred. Up until 1989, there was a lack of coordinated and integrated prevention, preparedness, and response efforts between central and local government institutions, on the one hand, and the RRC and ministries, on the other. In 1990, the government launched its National Disaster Prevention and Preparedness Strategy, which was designed to address three important issues: Integrated disaster prevention, preparedness, and responses. However, the Marxist government was toppled in 1991, before implementing these strategies.

The 1984 famine contributed to the mobilization of forces that eventually led to the overthrow of the regime in 1991 (Devereux, 2007), which means that the famine claimed the political powers of two successive governments.

4.4.3. The current regime

After the downfall of the military regime in 1991, the Transitional Government of Ethiopia enacted a National Policy for Disaster Prevention and Management (NPDPM). This policy set out objectives that emphasized disaster prevention and preparedness measures, the actions needed to link relief measures with long-term development, and livelihood-enhancing actions (TGE, 1993). Accordingly, the government decided to promote food-for-work initiatives under the employment generation scheme instead of all other free food distribution activities, with the aim of rebuilding productive assets and improving livelihoods by harnessing relief food aid flows to the country (Kehler, 2004). A national program for disaster prevention/mitigation and preparedness, which established an institutional and a resource base for the execution of the policy, was also issued in November 1993. The establishment of the national program and enactment of the emergency code consequently contributed to streamlining the implementation of the schemes and structures down to the *kebele* level (Abebe, 2009).

In August 1995, the RRC was re-established as the Disaster Prevention and Preparedness Commission (DPPC) under proclamation No. 10/1995. The main objectives of the new DPPC were to prevent disasters by tackling their root causes, to build the capacity necessary to reduce the impacts of disaster in advance, and to ensure the timely arrival of necessary assistance to the victims of such disasters. In general, the institutional reforms of August 1995 underlined a shift of emphasis, from addressing the consequences of food crises, to preventing such crises from happening in the first place (Van Uffelen, 2013).

In 1999/2000, Ethiopia faced another drought crisis, but this time, it coincided with the Ethiopian-Eritrean border war. The major victims of famine were pastoral communities in the Somali Regional State, and because of the conflict, little attention was given to the food security problem, to which the responses of the international community and the government were exceptionally slow. According to Salama et al. (2001), approximately 77 percent of the deaths due to hunger and associated cases in the Gode area occurred before the arrival of major food aid in April/May 2000. The total number of deaths from drought-induced food crisis by this time was estimated at 72,000 to 123,000 lives (Salama et al., 2001).

Another drought and food crisis happened in 2003 because of the late onset of rainfall and low grain production. It left more than 13 million people in need of food aid, with chronic malnutrition peaking at approximately 52 percent (MOARD 2009). However, this food crisis was not declared a famine by the government or the international community. This showed that vulnerability to famine was perceived as a disgrace, something bad to be ashamed of by both Ethiopian politicians and the international community—and something to be addressed at all costs (Van Uffelen, 2013). As a result, the then prime minister declared food security as the top priority of the Ethiopian government and launched a large-scale consultation process called the New Coalition for Food Security (NCFS) (MOARD 2009). The NCFS worked on ways to reduce the nation's dependence on foreign emergency food aid and to phase it out totally. Following this consultation process, the government revised its existing food security program to include resettlement, a productive safety net, and other food security interventions. In 2004, the DPPC was renamed the Disaster Prevention and Preparedness Agency (DPPA), to implement the revised food security program.

With regard to the major components of the revised food security program, there was unanimous support for the integrated use of the productive safety net (PSNP) and other complementary food security initiatives by the government of Ethiopia and its development partners, while the resettlement component was supported only by the government. As a result, the PSNP was funded fully by the international community, mainly the World Bank, while the resettlement program was financed entirely by the Ethiopian government.

In 2011, a drought in the Horn of Africa affected the pastoral lowlands of Somali and Afar. About 4.6 million people were in need of food aid, and the government managed the situation before it reached an acute level of famine.

Following a business process re-engineering for the DPPA, the new National Policy and Strategy on Disaster Risk Management (NPSDRM) was approved by the Council of Ministers in 2013. The major objective of the new policy was to reduce disaster risk and potential damage caused by a disaster by establishing a comprehensive and coordinated disaster management system. The policy focused on reducing disaster risk and vulnerability by integrating the issue into development plans and programs, in order to save lives in times of disaster, protect livelihoods, and ensure all disaster-affected people would be provided with recovery and rehabilitation

assistance. The policy also aimed at reducing dependency on relief aid and mainstreaming disaster risk management into development plans and programs across all sectoral institutions as a mechanism of implementation at all levels.

Following the approval of the new policy, the DPPA was re-organized as the Disaster Risk Management and Food Security sector (DRMFS) in 2013. The peculiar difference in this policy from the one revised in 2003 was that it integrated saving lives and livelihoods and also focused on reducing and avoiding risks before they caused disasters. The new plan took on a multi-hazard and multi-sectoral approach. As indicated in the objective of the policy, it was planned to be mainstreamed into sectoral ministries, departments, and other relevant bodies so that all actors, starting from the local community, would be responsible for disaster risk reduction and management. Unlike earlier policies, this policy envisaged addressing not only the population in the drought-prone areas, but also vulnerable people in other parts of the country, including in urban and high-potential areas.

Despite these policy revisions and institutional reforms, in 2015 and 2016, the El Niño-induced drought created a food crisis that affected over 10.2 million people in the north, northeast and eastern parts of the country. The crisis extended to the remaining pastoral areas of the country, thereby intensifying the food, feed, and water shortages (NDRMS, 2015).

The New Coalition for Food Security predicted that Ethiopia would graduate from dependence on food aid to self-sufficiency by 2015. However, only 15 percent of the PSNP's beneficiaries were reported to have seen success in this regard by the stated time.

In general, the food security problem in Ethiopia has continued on an even broader scale, affecting more people and demanding more resources from time to time. Over six billion dollars have been invested on emergency relief operations since the 1973 famine, but the problem is expanding and is still an issue of concern (Pankhurst & Rahmato, 2013). Some authors have indicated that the famine landscape is changing towards the southern part of the country, since the government is taking maximum care to minimize the risk of famine in the north, fearing its political implications, since it was one of the main drivers that claimed the political power of the last two regimes (Lautze & Maxwell, 2007).

4.5. Discussions and conclusions

Ethiopia has suffered from decades of food insecurity that has threatened the lives of millions of citizens. The international community and successive Ethiopian governments have made tremendous efforts to avert these problems, spending over six billion USD since the 1973 famine (Pankhurst & Rahmato, 2013). However, the root causes of the problem have yet to be addressed, leaving many people affected by the ongoing food insecurity risk. The major causes of food insecurity in Ethiopia are natural calamities and institutional constraints related to government policies and strategies. Natural calamities include recurrent drought, floods, and related climatic variables that result in crop failure and the massive loss of livestock. Institutional constraints include problems in government policies relating to land tenure and its use, constraints in agricultural developments, including extension and marketing policies, and food security policies and strategies.

Despite a form of private landownership that was created through the imperial land grant arrangement by the imperial regime, land generally has never been a real private property in Ethiopia (Rahimato, 1984). The private ownership of land by individuals and institutions during the imperial regime lasted in effect only as long as the individual stayed loyal with the crown. This means that land was a source of power and has continued to serve the same purpose during the *Dergue* military regime and up to the current government. Smallholder farmers have use rights over a certain plot of land allotted to them, as long as they abide by the terms and conditions set by government legislation.

Ethiopia was a net exporter of cereal grains during the early 1950s (Adams, 1970). This was because growth in food production was slightly above population growth without government intervention (Rahimato, 2009). Assuming that crop production would continue growing in the same way, the first and second five-year development plans of the country neglected agriculture in general and smallholder farming in particular. The adverse effects of the first two five-year plans were observed in the 1960s. Cereal production lagged behind the growth of both the urban and the rural population, and the country for the first time in its modern history became a net importer of cereals, with imports amounting to 45,000 tons in 1959/60 (Aredo, 1990). This implies that Ethiopia turned into a net importer of cereals, mainly because of the policies which neglected smallholder farmers, who were the major producers of these crops.

There were several contradictions in the development policies and strategies of Ethiopia in the imperial era. The first among these was the promotion of smallholder farming and large commercial farms in the southern highland areas of the country during the third five-year development plan (end of the 1970s) (Stommes and Sisaye 1979; Stahl 1974; Rahmato 1998, 2011). Implementation of this plan created policy contradictions, in that large commercial farms expanded by evicting tenant farmers and damaging their livelihoods. This created discontent among the poor peasant communities. This discontent, coupled with the hidden story of famine and other factors, marked the end to the imperial reign (Stahl 1974; Rahmato 1998; Rahmato 2011). The current government is promoting the development of smallholder farming but has gradually introduced policies and strategies promoting large commercial farms. The result of these policies is also starting to displace smallholder farmers in the central and southern parts of the country, to make way for the larger operations (Rahmato, 1994, 2011a; Stahl, 1974c; Stommes & Sisaye, 1979). As enshrined in the constitution of the Federal Democratic Republic of Ethiopia (EFDR), all lands belong to the state, and smallholder farmers have a usufruct right over it. According to the land legislations of the country, when a certain tract is needed for public services or large investment projects, holders of the land use right will be compensated a certain figure determined by law, and then evicted from their holdings. The problem with these laws lies in the size of compensation that is given to the victims. This compensation is too small relative to the rate at which the government leases out the land and the damage inflicted on the livelihoods of the victims (Rahmato, 1994, 2011; Stahl, 1974; Stommes & Sisaye, 1979). This issue was one of the major reasons for the mass protests in the Oromia region in 2015/2016. The second policy contradiction worth mentioning here is the distribution of imported wheat at subsidized rates (Wakeyo & Lanos, 2015) to protect consumers and removal of input subsidies following the structural adjustment program that was implemented since the 1990s. This means that farmers have to compete with subsidized imported wheat grain while using subsidy-free fertilizer. On the other hand, while removing subsidies on input prices has escalated the cost of production, the price of maize grain has been systematically suppressed through export bans on the crop (Rashid et al., 2010) and other mechanisms of the EGTE. Such policy contradictions in the distribution of subsidized grain, and suppressing grain prices for the major produce of farmers, have exposed family farmers to unfair competition, which may negatively affect their productivity in the short term and endanger the food security situation of the nation in the long term (Demeke, 2012; Kuma,

2002; Sen, 1981). Taking this notion into account, the reverse government action of subsidizing inputs might have better long-term impacts that may benefit both producers and consumers, since it would encourage production and the better use of inputs.

The common target of the policies and strategies of the past two governments and the current EPRDF policies and strategies is to achieve food self-sufficiency. The current government has made tremendous efforts to achieve this goal through its intensive extension program. Accordingly, surplus grain production was seen in 1995/96 and 2002 to the extent that the markets were over-supplied and prices fell abruptly, resulting in grain prices failing to cover production costs (Rashid et al., 2010; Rashid & Negassa, 2012). In both years, the government was forced to intervene through the EGTE, to stabilize the market. While markets in the high-potential areas of the country were over-flooded, millions of people in drought-prone areas of the same country were in desperate need of food aid. Moreover, while the government intervened by exporting grain in both years, it was forced to look for food aid immediately, due to the reverse condition because of low production that happened as a result of low input use and bad weather conditions in the following season (Demeke, 2012; Kuma, 2002; Sen, 1981). This implies that food self-sufficiency might not be practical unless there is a functioning marketing system.

Ethiopia has struggled with the challenges of ensuring the food security of its people for the last five decades. However, the efforts of successive governments have been countered by climate-related variables, with recurrent droughts being the major factor. Drought has been affecting at least some part of the country every year leaving millions of people in need of emergency food aid. Despite efforts to contain the problem through the coordinated efforts of the international community and the government, the numbers of victims increase from time to time. As indicated in the earlier paragraphs, the growing problem is not only because of drought and other climate-related problems, but also to the different policies and strategies implemented by successive governments. The results of these policies have been observed to have worsened the famine situation in 1973 and 1984, and these famines in turn have contributed to the abolition of two last governments. The current government is trying to address the food insecurity problem in as much as possible. However, it is becoming difficult to contain the problem. I argue that the government needs to reconsider the negative effects of path dependencies and inter dependencies in its plans, policies, and strategies that perpetuate food insecurity. This is because some of the

policy measures have damaged the livelihoods and food security of people and they have the potential to create similar impacts on state power in the future.

5. Evolution of Rural Governance: Case Studies from Southwestern Ethiopia

5.1. Introduction

Rural governance is a critical cross-cutting issue for family farming households in Ethiopia. Addressing rural governance in this study stems from the fact that it affects not only the livelihoods and food security of rural communities, but also the nation as a whole and the national economy at large. According to Van Assche and Hornidge (2015), rural areas can be defined relative to urban areas, as areas that are not urban, or in terms of population density, and access to infrastructures for transportation services, information, market, and other social services. The Ethiopian National Labor Force Survey (CSA, 2005) also defined rural areas as all localities that are not urban and whose inhabitants are primarily engaged in agricultural activities. However, this does not mean that rural areas are all about agriculture, since any rural development strategy has to start from a multiple land use perspective (Van Assche & Hornidge, 2015). Hence, rural governance involves multifaceted issues characterized by the interaction of different actors, including family farmers, the government and non-government actors, institutions, and resources, especially land and labor.

Family farming households, the major residents of rural areas in Ethiopia, are exposed to several sources of food insecurity risk. Some of the major sources of food insecurity risks are recurrent drought and other adverse climate variables, crop and livestock diseases, fluctuations of input and output markets, and socio-political and institutional risks (Webb & Von Braun, 1994; Von Braun & Olofinbiyi, 2007; Bewket, 2009; Taffesse et al., 2012; Hill & Porter, 2017). Rural governance involves addressing these webs of interconnected and complex sources of risk. Since the perception of risks are rooted partly in how past generations and regimes addressed and managed related shocks, we need to have evolutionary lenses that enable us to understand how the past can influence the present and what can be learned from the past. This may serve as an input to manage the current challenges existing in rural Ethiopia, where food security is still at the forefront of family farmers' concerns.

In this chapter, I focus on governance paths in rural Ethiopia, in order to shed light on important implications of evolving governance on the livelihoods and food security of current and future generations. The chapter starts with the governance structure during the *Gada*

administration (pre-imperial era) and proceeds with evolution in social organizations, dynamics in formal and informal institutions, knowledge/power configurations, dependencies and their implications, as well as other related issues in subsequent regimes. The ERGF is applied in the analysis of the evolutionary paths during the different regimes.

5.2. Evolution of governance since the pre-imperial period

5.2.1. The *Gada* administration

Ethiopia as a state can be traced back to the Axumite civilization in the northern part of the country around the 10th century BC (Ayele, 2011). From the time of Axumite civilization up to the 1850s, the country was composed of local kings (Rahimato, 1994). The southern part of current Ethiopia (the current states of Oromia and Southern Nations and Nationalities and People's Regions) were included in the Ethiopian empire from the 1880s to the 1890s (ibid). Before its inclusion into the Ethiopian empire through the expansionist movement of the 1880s, Oromo land was governed by the *Gada* system (Baissa, 1994; Hassen, 1994; Legesse, 2000; Ayele, 2011). *Gada* is an egalitarian, democratic, social, and political system that has been effectively practiced in the Oromo land before 1890s (Baissa, 1994; Hassen, 1994).

The building blocks of the *Gada* system were the *Gada* (*luba*) rulers, the moety organization (*qallu*, electors and ritual leaders), the general national assembly (*gumi*), and age organization (the *hariyya*). According to Legesse (2000), "The *Gada* system is a system of *Gada* classes (*luba*) or segments of generations that succeed each other every eight years in assuming political, military, judicial, legislative and ritual responsibilities." A generation in the *Gada* system is 40 years, divided into five periods, with each lasting eight years (Hassen, 1994; Legesse, 1973, 2000). The nation is divided into five parties, each with specific roles and functions to perform in five stages, each lasting eight years in the system. Each male Oromo enters into these five stages of roles and responsibilities upon birth. Each of the *Gada* class (*luba*/parties) above the third stage (i.e. the fourth and fifth *Gada* classes) has its own leaders, known as *hayyu adulas*, and its own assembly, known as *yaá*. The *hayyus* (leaders of *lubas*) become leaders of a nation organized into national and local councils to administer the country. The *luba* council serves as a legislative body, with executive responsibility assigned to a few officials elected for specific responsibilities (Baissa, 1994). The apex of the *luba* council is the *Abba Gada*, who is the political head and

spokesman of the government (Hassen, 1994). The *Gada* council also has an *Abba Dula* (father of the war), a military leader, and an *Abba Sera* (father of the law), an expert in traditional law. The council of elders, known as the *shanee* or *salgee* council, is formed from retired *Gada* officials, in order to support the active *Gada* structure in legislative issues at higher levels and to take care of the day-to-day community governance, thus ensuring the peace and stability of their local areas (Hassen, 1994; Jalata, 2012).

The word *shanee* also signifies the social organization of the Oromo people next to the household (Figure 5.1). According to an ethnographic study by Megersa (1993), *shanee* (also known as *shanacha* in some places) consists of five households grouped under the leadership of an *Abba Shanee.* Megersa (1993) indicated that the "*Abba Shanee* is responsible for managing the overall affairs of its members ensuring its peace and security, discussing natural resource use with the heads of the households, allocating labor for the different tasks, settling disputes between the individuals and families and representing their interests at the level of *Olla.*" *Olla* in turn is a group of at least five *shanees* headed by the *Abba Olla* (leader of *Olla*). *Abba Olla* has similar roles to the *Abba Shanee* in guiding the day-to-day activities of its members based on customs and laws, maintaining close links among *shanee*s, and taking care of issues that are beyond the reach of *Abba Shanee*s. Several *olla*s join together in one neighborhood to form *reéra*. The different *reéra* join together and form *dheéda*, which in turn link up and form the *Gada* assembly.

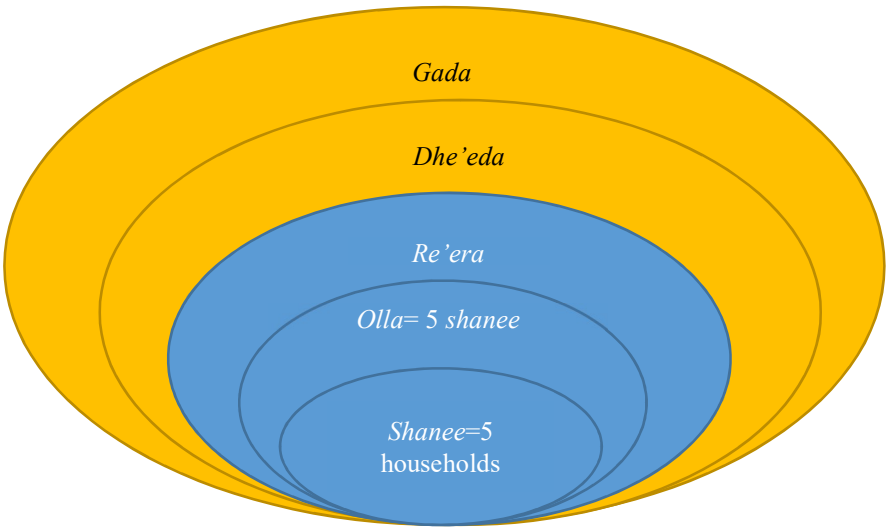


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Figure 5.1: Social organization during the *Gada* administration

The *Gada* government is a confederacy of different, autonomous local governments known as *afrechas* (*dhe'edas*). The introduction of *afrecha* into the *Gada* system was to cope with population growth and the spread of this population in different directions (Hassen, 1994). Each *afrecha* is a miniature version of the overarching *Gada* system, with all the components of the system at local levels. The governance structure and function of all *afrechas* are similar to each other, since they are bound together by the Oromo spiritual leader, the *Abba Muudaa* (Hassen, 2005). *Abbaa Muuda* inspires all the *afrecha* leaders to follow specific *Gada* principles and guidance during the mandatory pilgrimage visits that each leader pays to him in regular ceremonies and events (ibid).

The assemblies at different levels are the major pillars of the *Gada* system, which has a unifying national-level assembly (*gumi*), *afrecha*-level assemblies, clan, and very local (*arda*)-level assemblies. The general assembly of the nation (*gumi*) is made up of the *Gada* assemblies of all *afrecha* assemblies and councils of the active and retired councils (Hassen, 1994; Legesse, 2000). The *gumi* meet once every eight years to review any unresolved conflicts and the performance of the outgoing *Gada*, as well as review new laws and issue proclamations for the next eight years (ibid). The *afrecha*-level *Gada* assemblies meet more frequently and have the power to make decisions on specific *afrecha* specific issues. The council of elders, known as *shanee or salgee*, at the local level is concerned with the day-to-day jurisdiction of the community (Marco, 2005; Jalata, 2012).

5.2.2. The imperial regime

Ethiopia came under central government administration during the reign of Emperor Minilik (1889-1913) (Zewde, 1991). Minilik centralized the nation under a unitary state regime and divided it into different provinces and *Awurajas* (subdivisions of provinces). The emperor used both diplomatic persuasion and military coercion to expand his empire southward to the current Oromia and southern regions of the country (Ayele, 2011). In the areas where the authorities of local governments and kingdoms peacefully submitted to the expansionist force, Minilik allowed them to retain their kingdoms, provided that they pay the necessary tributes to the central government as well as keep the peace and stability of their areas (Ayenew, 2007). Some of these

leaders, who were followers of Muslim or other non-Christian religions, were forced to convert to Christianity and learn Amharic (Ayele, 2011). In areas where local kingdoms confronted Minilik's forces, the local authorities were disrupted and put under the direct rule of the central government. In such cases, the emperor gave governorship of these regions to his generals, who led the war of conquest against these kingdoms (Daniel Weldegebriel, 2012). The generals again subdivided their granted areas into different localities and appointed their subordinates as governors of the area. Due to language, cultural, and resource limitations and barriers to administering the new areas, the centrally appointed regional and local governors needed help from the indigenous leaders (Ayele, 2011). The indigenous leaders who were given the title of *balabat* (named *Abba Qoro* by the local community) were placed under the *woreda* administrator. The *Abba Qoro*s acted as a bridge between their community and the governors, with the main task of maintaining peace and security, assisting the regional and local governors in collecting taxes, tributes, and mobilizing the local people when assistance was needed by central government (ibid). The advantage of the *Abba Qoro*s was that they maintained their land, unlike the rest of the community, whose land was totally confiscated by the expansionist force and given to the administrators, soldiers, church, and nobility.

Emperor Hailesillassie (1930-1974) strengthened his project to centralize and build a unitary Ethiopia by introducing the first written constitution in 1931, in which he extended his absolute power over central provincial and local governments. This constitution replaced the traditional provincial governors with appointees loyal to the emperor. By the decree promulgated in 1942, which defined the role of Ministry of Interior, three levels of government, namely province (*teklay gizat*) divided into *awuraja gizat*, and *woreda gizat*, were formed throughout the country. *Woreda gizats* also had deputies, known as *mikitil woreda gizat (mislene)* (Figure 5.2). The structure below the *mikitil woreda gizat* was the *qoro* (a subdivision of the *mikitil woreda gizat*) and *ganda*. According to information obtained from in-depth interviews (Int. code no. 102, 2015; 75, 2016), these structures were also in place in the study areas, and the positions above the *qoro* were filled with the outsiders, while *Abba Qoro* (the father/administrator of *qoro*) and *Abba Ganda* (the father/administrator of *ganda*) were assigned from the local area. I learnt that there were about six to 12 *gandas* under each *qoro*, and there were two to three *Abba Shanees* under each *Abba Ganda*. The task of the *Abba Shanee* was to transfer orders from the upper administrative structures to

about 200-300 households under their command area. *Abba shanees* can have two to three *Aba Labsi*s (messengers).

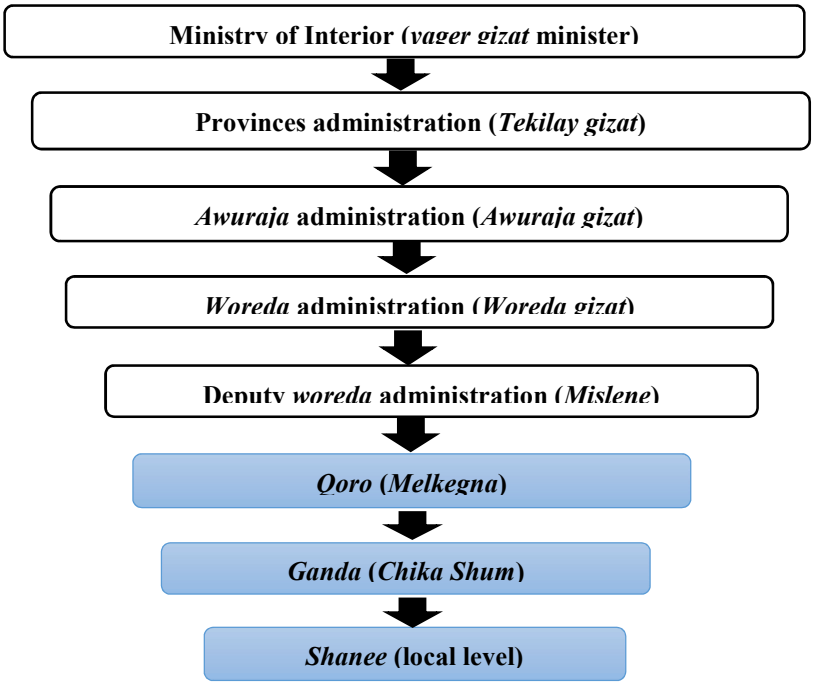

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Figure 5.2: Administrative structure during the imperial regime

Formal and informal institutions during the imperial regime

The imperial governments of Ethiopia created a system of central government in which the local community fell under the direct and indirect control of the monarchical throne. After the 1931 constitution, which was issued after the coronation of Emperor Hailesillasie in 1930, all powers over central and local government, the legislature, the judiciary, and the military were vested in the emperor (Ayele, 2011; Zewde, 1991).

After the control of the southern part of Ethiopia by Emperor Minilik, the *shanee*, which was a formal institution of community governance during the *Gada* regime, was changed into an informal institution. With this change of formality, there were times when it was invisible but nevertheless served its purpose of community governance. The rural community maintained the

continuity of this institution in different forms, the first of which involved using its organization through different names and in different places. For example, it was known as *Tuula* in the Yoyu area, Ilubabor zone, Oromia region (Tulu, 2010; Toli & Boland, 2006), *reji* in the Jimma area and *Iddir* in Bako (Lewis, 1974). *Reji* was a voluntary organization whose major purpose was to support members in organizing burials, help bereaved families, and attend funerals, in addition to aiding those whose house had burned down, oxen had died, and who had met other misfortunes.

Rejis met every month to settle conflicts arising because of matters related to its services, and to collect fees for the association. In addition to its regular services, it was involved in resolving conflicts within the community (ibid), albeit it should not compromise the power of the throne. Since the imperial regime vested all powers to deal with any jurisdiction of the throne and its agencies, other institutions were not allowed to engage in the jurisdiction of conflicts without permission. According to the informants (Int. code no. 102, 2015 & code no. 102, 2016), the council of elders in the *reji* by this time was not allowed to impose social sanctions to enforce its jurisdiction. However, this does not mean that the *shanee* was powerless during the imperial regime. Rather, the mode of enforcement changed and became implicit, though it still plays indispensable roles in the society.

Apart from the *shanee* under the umbrella of *iddir*, there is a council of elders, known in the Oromo language as *Jarsa biyya. Jarsa biyya* has different levels depending on the level of issue on which it arbitrates. Simple conflicts between neighbors, intra-household conflicts, and conflicts due to the daily lives of the community are taken to the council of elders located in the immediate vicinity of the two parties. Such elders bring the two parties together by resolving the conflict at hand, based on the facts and all available evidence. Such elders are selected based on their experience, credibility in the community, and social acceptance in the society, regardless of their wealth and genealogy (Jotte Tulu, 2010). When things are beyond the jurisdiction of these elders, the case would be taken to the *shanee* under the umbrella of *reji*.

The higher level of *Jarsa biyya* is territorial, found at the *kebele* level and beyond (Tulu, 2010; Toli & Boland, 2006). Membership of *Jarsa biyya* is based on three important criteria, the first of which is being the *Abba Gada* or member of the serving *Gada* council. The second is genealogy in places where there is no *Gada* council. In such cases, the eldest son of the family, considered the elder of that specific rural community, would be head of the *Jarsa biyya*. The third

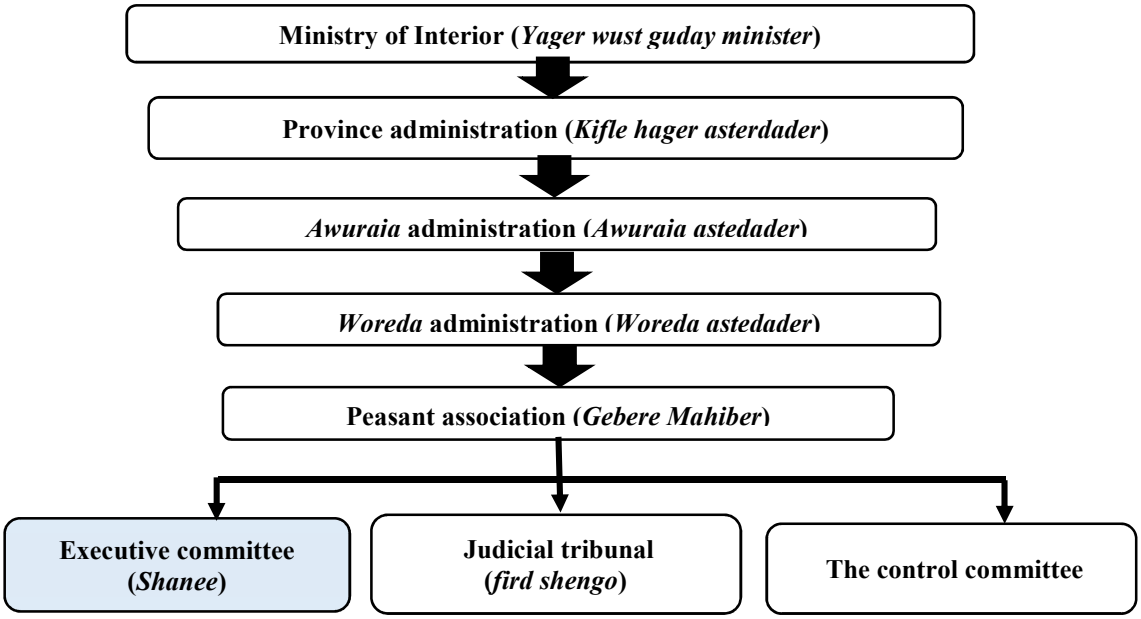
is having a good reputation and good knowledge of local customs and traditions. According to informants (Int. code no. 56, 2015; 118, 2016), this level of *Jarsa biyya* has nine members and deals with big social agendas such as the reconciliation of issues related to murder. For instance, the case of murder is taken to the court and the perpetrator given the verdict according to law when there are evidences. Though the perpetrator would be penalized for his/her crimes, the family of the deceased and the perpetrator might attack each other in revenge for the lost life. However, the council of elders plays a key role in maintaining peace and stability in such cases by softening the issue and initiating the *guma*[10] ceremony so that both sides would not plot revenge. In extreme cases, the council of elders can arbitrate between the murderer and the family of the deceased, even when the former is not under the custody of law. *Jarsa biyya* has a social power assisted by religion and the traditional belief in settling fierce disputes and normalizing situations. Rural people in the study areas believe that accepting the words of elders and getting their blessing is very important for one's future life. Such things made the role of the *shanee* and its different forms of application indispensable. This role also ensured its continuation through generations.

According to informants (Int. code no. 75, 2015; 100 & 101, 2016), the formal government administration was also using *shanee* in critical times. For instance, *woreda* governors needed the council of elders to uncover crimes such as robbery and other acts committed in the community when ample evidence was not readily available to take the case to the court. The involvement of the council of elders (which rural communities still call a *shanee* council) in this case was through the mechanism known as *awuchachigne.* Once the council of elders generated evidence, the case went to court. During this time, the *shanee* council had no power to make any decision or enact the community's customary laws on perpetrators. If the *shanee* council failed to uncover the criminals, the community had the obligation to contribute resources and pay for properties lost, if the case under investigation was a robbery/theft. As agencies of the throne, the *woreda* governors had the power to forgive the perpetrator, even after the verdict of the court.

[10] *Guma* is a ceremony in which the council of elders arbitrates between a person who has assassinated somebody and his kin with the family and kin of the deceased, to stop further bloodshed through revenge.

5.2.3. The *Dergue* regime

After the downfall of the imperial regime, the *Dergue* government assumed power in 1974. Immediately after gaining power, the *Dergue* consolidated the existing 14 provincial administrations and replaced all serving governor-generals. The provinces (*teklay gizats*) were re-structured and organized as regions (*kifle hagers*), which were then divided into a total of 102 sub-regions (*awurajas*) and 556 *woredas* (Ayenew, 2007). The 1975 land proclamation also established peasant associations (PAs) to implement the redistribution of land and take care of local-level governance in rural areas. One PA had the mandate to administer an area of about 800 hectares or more, and elected members led these bodies. The PA leadership was composed of an executive committee (which people called them *Abba Shanee*s, with the intention of preserving names from the early days in the *Gada* system), an inspection committee, and a judicial tribunal.



Source: Own Sketch

Figure 5.3: Administrative structure during the *Dergue* regime

Formal and informal institutions during the *Dergue* regime

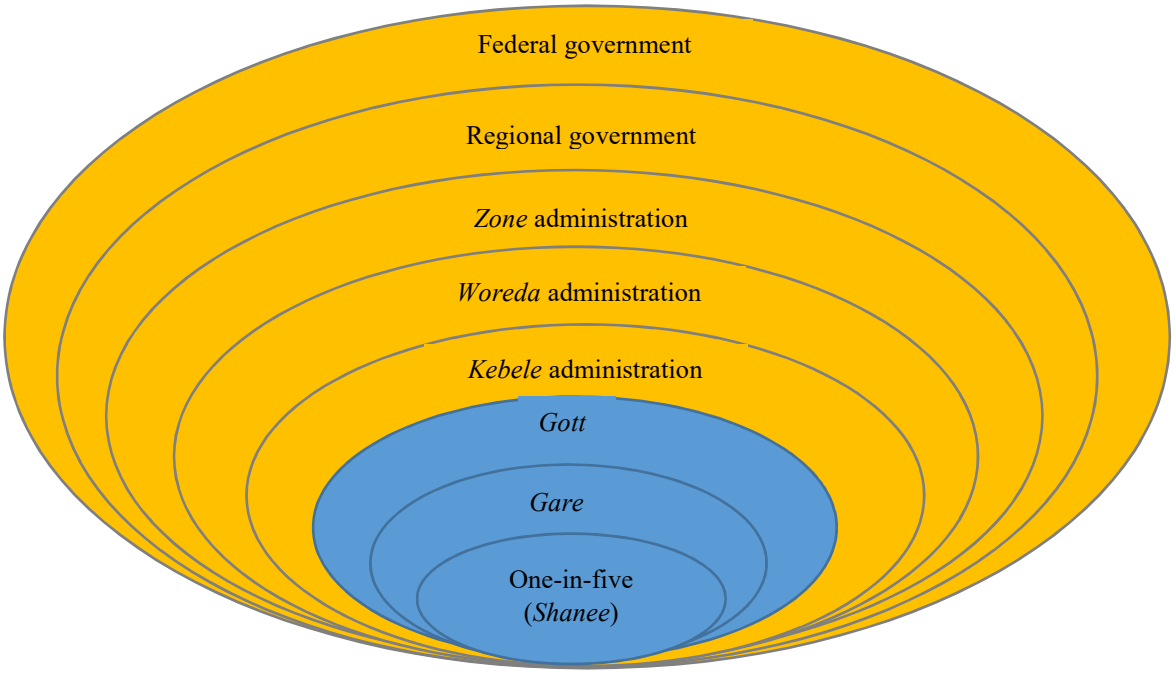
PAs had relatively more power to make decisions at the local level compared to the government structure during the imperial regime. The PAs had power to deal with land re-distribution, administer and conserve public property such as water and forestry, establish judicial tribunals and solve land disputes, establish cooperatives and physical infrastructure (such as schools and clinics), and undertake villagization programs. The judicial tribunal of each PA had mandates to hear and decide any dispute involving pecuniary claims of up to ETB 500 or any disputes over property of a value up to ETB 500. The tribunal also had the mandate to deal with disputes related to land within the PA, the division of common property, and fees for the collective use of lands and instruments. It had the power to hear and decide on disputes between the PA and its members on the payment of loans advanced through the PA. Moreover, the PA judicial tribual was given the power to hear and decide on most criminal jurisdictions. In principle, devolvement of power to the local level enabled family farmers to be led by their 'own' representatives. However, in practice, this was not implemented as initially intended (Bekele, 1982). Instead, PAs became the political arm of the military government, in order to control the rural population and to enforce all sorts of impositions, ranging from the recruitment of military personnel and forced villagization, to the supply of grain quotas to the Grain Marketing Corporation (ibid).

Despite the intention to make use of their informal institution, implemented through the *Shanee* and practiced under the cover of *reji* and *Jarsa biyya*, the rural community was under huge pressure from the military government. Not only the council of elders (that were already suppressed during the imperial regime), but also the *reji/iddir* proper were not encouraged at this time. This was mainly because of the perception that reactionary forces controlled *rejis* and the conflicts of the so-called 'reactionary forces' with the newly established PA leadership (Pankhurst & Hailemariam, 2000). However, the rural community continued to use its informal institutions because of their indispensable roles. As was the case during the imperial regime, the formal institution made use of the council of elders (which the community still called *Shanee*) as a tool to solicit evidence for complicated crimes for which it was difficult to get evidence in order to handle the case by the judicial tribunal of the PA. The different levels of Jarsa biyya also continued their roles despite the intention of the *Dergue* government to handle everything through a formal system (Int. code no. 75, 2015; 100, 101, 2016). The elders indicated that people were afraid of using informal institutions since the killing of over 64 ministers and high-ranking officials that served

the imperial government, and its actions during the red terror, which demonstrated the mercilessness of the *Dergue* government.

5.2.4. The current regime

The EPRDF deposed the *Dergue* military regime in 1991. Upon regime change, ethnic-based regions subdivided further into zones, and *woredas* replaced the province administration of the *Dergue*. The formal grassroots administrative structure during the current regime was the *kebele*. After the 2010 election, the ERDF introduced more administrative subdivisions to the *kebeles* in the form of formal social networks. In this arrangement, a group of five neighboring households form a one-in-five group with four members and one group leader (Figure 5.4). Again, a group of five one-in-five groups form one *gare* (a development group). The leadership of the development group (*gare*) is composed of an *Abba Gare*, the five *Abba Shannees* that are members of this *gare*, and the leader of the zone in which the development group is located. Members of the *gare* assign an *Abba Gare* (the leader of the *gare*). This person need to be member of the ruling party so that he could inspire the five *Abba Shanees* (leaders of one-in-five groups). The *Gare* is expected to solve problems that could not be solved by the one-in-five group. A number of *gares* form a *gott* (*zone*), and one *kebele* is composed of three *zones/gotts*.



Source: Own Sketch

Figure 5.4: Administrative structure during the current regime

According to directives for the formation of the one-in-five group, and discussions with informants (Intr. cod no. 56, 2015), the leaders of all three stages of the community organization are preferably affiliates (members or strong supporters) of the ruling party. According to information obtained from government documents and discussions with informants, this new subdivision is the result of lessons learnt during the election campaign in 2010, with the intention "to repeat the election victory in agricultural development." The major assumption is that party members with "demonstrated efficiency in convincing farmers to vote for their party" can play a similar role in development activities. In this case, the major tasks of the leaders are to convince their fellow group members to develop crop plans, prepare their plots, procure inputs, follow intensive training programs, and implement the knowledge obtained to boost their production. However, in cases where members of the party have a marked weakness in planning and executing their farming practices, better performing farmers are selected to lead the farmers' one-in-five groups. According to guidelines for the establishment of one-in-five groups, the leaders of these

groups organize meetings with their members every three days and discuss any progress or problems encountered, in order to motivate them toward achieving their intended goals.

Informants and the literature indicate that the one-in-five and *gare* systems of community organizations are adopted from the *Gada* system (Megerssa, 1993) (Int. code no. 75, 2015 & 102, 2016). As shown above, there were similar social organizations during the *Gada* administration. I understand that the re-introduction of this form of social organization emanated from a good understanding of the power of such a social organization in the *Gada* system, with some modifications set up to adapt it to the existing reality. According to the informants, one-in-five and *gare* are not new concepts but have been used in different contexts during different regimes. Accordingly, the 200-300 people organized under the *Abba Shanee* during the imperial regime, and those people organized under the seven executive committee members of the PAs (the rural community calls them *Abba Shanees*) during the *Dergue* regime, followed a similar structure. My informants indicated that *Abba Shanees* during the imperial and the *Dergue* regimes led hundreds of farmers. This means they were not able to understand the situation of individual households in response to the delivered messages. Due to the communication gap with *Abba Shanees*, each household did not have the chance to present why they had not implemented their orders. According to discussions with elders, *Abba Shanees* during the *Dergue* regime were stronger and more efficient than the current one-in-five groups in terms of mobilizing the community around a certain theme, because it was not easy to gain access to the then *Abba Shanees* and provide justifications not to perform what was required. As a result, the choice was either to execute their orders or accept punishment for not accomplishing what they had been instructed to do. In the case of the current one-in-five leaders, they are one of the five neighbors that can also be members of one family. As a result, members of one-in-five groups can easily convince their leaders to get permission not to execute the orders. According to my informants, the leader and members of a one-in-five are close to each other and help create excuses not to execute orders from higher government structures. This means the enforceability of order from higher government hierarchies is lower with the current one-in-fives compared to previous government structures.

Major actors in rural areas, and their characteristics

The current local government administration in rural Ethiopia is the *kebele*. This level of administration is responsible for implementing most of the government rules and regulations targeting rural and agricultural development. The *kebele* administration is actively involved in all sorts of agricultural development activities, namely the development of social services such as education, health, and the maintenance of peace and stability in the area. Implementation of these different policies and development plans in rural areas involves different actors. Family farmers are the major actors in rural Ethiopia in general and the study areas in particular. Other important actors include extension agents, schoolteachers, experts in government offices working with the rural community, and officers of *woreda* administrations. Some nongovernmental organizations including World Vision and United Nations-affiliated organizations such as the United Nations Development Program (UNDP), also operate in the study areas. These actors have interconnected and mostly interdependent activities, though they all have their own objectives and guiding principles. However, depending on the ways in which different actors implement these different policies and plans, the power/knowledge configuration in the study areas varies and needs due consideration and understanding.

Land is the major source of livelihood for rural households in Ethiopia in general and family farmers in the study areas in particular. The ultimate owner of the land is the government, even during the imperial regime when there was a certain form of private ownership by elite groups and social classes affiliated with the monarch. The 1975 land proclamation of the *Dergue* totally nationalized land, and it is still in the hands of the government, while family farmers have a usufruct right to farm it. The average land holding in Ethiopia is 1.77 hectares per household (CSA and World Bank, 2013), and it is 1.7 hectares per household in the Kersa and Omonada woredas and 1.1 hectares in the Bako-Tibe woreda. However, holding sizes vary significantly among farmers. Results of the household survey show that over 20 percent of the households cultivate less than 0.5 hectares. In relation to farm size, over 81 percent of the sample farmers said that they do not have access to enough land to produce food and non-food products for their household. The most common strategies to gain access to more land involve sharecropping or renting-in. The results of this study show that 38 percent of the sample farmers sharecropped-in and 17 percent rented-in croplands in the 2014/2015 cropping season. On the other hand, about 55 percent of the sample households reported that they earned income from leasing out their farmland. According

to the results of the in-depth interviews, farmers sharecrop out/lease out their farmlands when they need cash urgently and when they do not have other near-cash assets such as livestock or access to credit. Sharecropping is an arrangement in which the owner of a land use right finds someone that will cover crop inputs (mainly chemical fertilizers and improved seeds) so that they can share the harvest. The share of the harvest depends on their agreement. The general scenario is the owner of land use right cultivates the land and covers all labor costs, while the sharecropper covers the input costs and they finally divide the harvest equally. The share of the final harvest from the sharecropped land that goes to the holder of the land use right becomes less than half when the sharecropper handles production activities, too.

Knowledge and power configurations in rural areas

A council composed of a chairperson elected from the community; a manager hired by the government and members of the *kebele* cabinet, including coordinators of extension agents; a director of the school in that *kebele*; representatives of the three *kebele gotts*; and the person represented from the *woreda* administration to coordinate the overall activities of the *kebele* govern rural *kebele*s. This means extension agents and other actors in rural areas are part of the *kebele* administration. From my observations, the involvement of professionals such as extension agents in decisions that may involve the personal welfare of individual households, in addition to their technical engagement with these households, tends to create a kind of power relation between the farmers and the respective professionals. According to my informants (Int. code no. 56, 2015; 92, 2016), being members of the council of a *kebele* administration, these local experts are involved in all sorts of decision-making, including those affecting access to the land of family farmers. This creates a scenario in which experts may favor some farmers and vice versa, depending on their closeness to and compliance with ideas they are promoting.

With the introduction of the one-in-five group organization in 2010, the government introduced the periodic ranking of farmers. Based on their level of participation in extension, input use, market orientation, political participation, their capacity and willingness to share their knowledge and experience with other farmers, and other socioeconomic activities, the extension system categorizes family farmers into three groups: Type A farmers (model farmers), Type B, and Type C farmers (MOA, 2010). Type A farmers are those who use the full package of crop and

livestock technologies, are able to buy fertilizer and improved seeds for cash, and produce a marketable surplus. Such farmers have good extension contacts, and they plan and implement their activities in consultation with extension agents. They also have a good level of political participation and are willing to inspire other farmers. Type A farmers are surplus producers and food secure. Type B farmers are intermediate farmers using improved agricultural technology packages; however, they do not always use the full package of recommended technologies. Type B farmers are not willing and/or able to inspire other farmers. Most of type B farmers are food secure. Type C farmers are generally poor and cannot afford to buy fertilizer or improved seeds for cash. As a result, they usually sharecrop out their land to those who are able to cover the costs of inputs. Type C farmers also lack livestock and other assets, so they are not able to get micro-finance credit, since they cannot get group collateral.

The important implications of categorizing farmers into different ranks can be seen from two important perspectives. The first is the creation of a sense of competition among this cohort and targeting different categories with different packages of technologies. The second is in terms of knowledge and power configuration in the farming community. The results of the household survey reveal the fact that those farmers classed as Type A have better access to credit and extension services, and they participate more in the political scene than Types B and C. Moreover, Type C farmers are resource-poor and food insecure, do not have access to credit, have less access to extension advices, and participate less in politics than their Type A counterparts. This sort of knowledge and power configuration creates or expands a social stratum in which wealthier farmers become more influential in the community, due to their greater wealth status, better access to knowledge, and their acceptance into the government's political decision-making circle. For instance, a lack of access to finance, which compels Type C farmers to engage in sharecropping arrangements, creates an opportunity for wealthier farmers to harvest more crops and therefore make more wealth. The issue one needs to note here is the trade-offs going on in the rural community. While those farmers that have better access to financial resources look for more plots of agricultural land, those who do not have access to finance to procure farm inputs are compelled to give up their scarce plots of land through different informal tenure arrangements. This creates a poverty trap for poor family farmers, since they lose at least 50 percent of their harvest in sharecropping arrangements year after year. On the other hand, those who acquire land through a sharecropping and/or rental arrangement usually become better off and enter into more of such

arrangements every year. The emerging better-off farmers that enter into different business activities generate their investment capital in such ways. This implies that the existing power/knowledge configuration in rural Ethiopia promotes the creation of few affluent farmers at the expense of several farmers who fall deeper into the poverty cycle. While this facilitates a take-off point from which wealthier farmers can break out of agriculture and move into a diverse business environment, it also creates more ultra-poor, food insecure farmers. This issue therefore requires focused policy and development action, to address the lack of access to finance and other causes that perpetuate poverty and food insecurity among the rural poor.

The informal institutions of family farmers

Jarsa biyya and *shanee*, a structure rooted in *reji*, run the informal institutions of family farmers in the study areas. *Reji* is a voluntarily established informal self-help community organization. According to focus group discussions (FGD code no. 13, 2015; 23, 2016) and in-depth interviews (Int. code no. 61, 66 & 69, 2015; 114, 117 & 118, 2016), *reji* has two major components: *arfe* and *shanee*. *Arfe* is responsible for helping members organize burials, arrange funeral ceremonies, support bereaved families, aid those whose oxen have died, and help those whose houses have burned down. *Arfe* also supports members in borrowing money and in some cases grain. It is also responsible for the management of members and resolving conflicts arising among members in the process of delivering the stated services. The *shanee/shanachaa* council is responsible for resolving conflicts arising in the community, finding out facts and soliciting evidence for wrongdoing for which it is normally difficult to acquire evidence to take the case to a formal court. Informants in all the locations indicated that *shanee* is the legacy of their ancestors, albeit the imperial and the *Dergue* military regimes suppressed its use. However, the current government does allow rural communities to make use of its customary laws. *Shanee* is responsible for several social issues, including natural resource management, women's rights, marriage, social behaviors affecting the peace and stability of the community, issues related to property rights, and community rituals. If there is an incident involving the robbery of assets, including livestock, grain, and other assets with limited evidence for a court procedure, communities make use of the *shanee* to identify the perpetrators and penalize them accordingly. This involves religious and traditional beliefs as well as social networks.

Structure of the reji/iddir

A *Reji* has different divisions responsible for its smooth functioning: *Abba Reji*, deputy *Abba Reji*, secretary, *Abba Salgaa*, the treasury, accounting and audit, the *arfe* council, the *shanee* council and *Abba Jiga*. *Abba Reeji* is the leader of the *reji* and is responsible for day-to-day activities. There is also a deputy *Abba Reji* that helps the *Abba Reji* and substitutes for him when he is not available in the area. The *Abba Salgaa* is responsible for announcing all events to members based on the orders of the *Abba Reji*. Such events could be the burial of a member or his/her family, the death of an ox, a general meeting of members, or a work campaign to help members for some reason. The *arfe* council, as indicated earlier, is responsible for handling the routine activities of the *reji*, including conflicts that arise from day-to-day activities, while the *shanee* is the informal legislator and jurisdiction of the community. The *Abba Jiga* is the overall control organ that takes care of members' appeals against the way the *Abba Reji* or the *arfe* and *shanee* council handle their case. The *Abba jiga* has the right to take the case to an independent council of elders, *Jarsa biyya*, and examine the appeal of members before deciding the next steps. If the member is not satisfied even with the response of *Abba Jiga*, the appealer has the right to appeal to a neighboring *reji*.

How shanee operates

The *Abba Reji* initiates the jurisdiction with the *shanee* council. Once the *Abba Reeji* receives an appeal about a certain case, he calls the general assembly of members through *Abba salga* and explains what has happened in their community and the need to set up the *shanee* that will handle the issue. He asks the general assembly if they have any doubts about the already elected regular members of the *shanee* handling the case. If the members suspect that any of the *shanee* members might have a stake in the problem at hand, they suggest the selection of a new member of the *shanee* council, after which two elders from the assembly swear-in the *shanee* members to handle the case with a high level of honesty in any circumstances. The swearing-in is according to their religious denomination and traditional beliefs. After they have been sworn-in, in front of the general assembly, the *shanee* members immediately start their duties. They talk to all members of the community, including elders, youths, women, and all other men. Interrogations start with swearing not to hid whatever fact the person may know in relation to the case under investigation.

Once the *shanee* gets a clue about the issue, they continue building a body of evidence and finally talk to the suspects. Since the *shanee* gathers all the necessary evidence, the suspect cannot deny committing the stated crime. If he/she does try to do this, he/she will face social sanctions. The important power of the *shanee* system lies in religion, traditional beliefs, and social sanctions. Rural people in general and people in the study areas in particular are afraid of social sanctions and the swearing or curses. People in the study areas call the social sanction as *tumaata*. Since the livelihood of the rural community is interdependent, the application of a social sanction is like terminating one's life. The person under the social sanction will not get community's support for the burial of her/his family or oneself, will not get any help if a fire accident happens on her/his house and no one is allowed to talk to her/him (completely ignored by everyone). In addition, no one will rent/sharecrop the sanctioned person's land even if she or he decides to leave the area. In some places, the livestock of said sanctioned person is not allowed to walk on community roads to reach their grazing pastures. People are also afraid of swearing, since they believe that it will affect their entire life.

Wirtu is a network of different *shanees* in a certain area. There is one *wirtu* per nine *kebeles* in Bako-Tibe *woreda*. One person or a member represents the *shanee*s in a given *kebele* at *wirtu*. All the *shanees* in the *wirtu* meet once a month and exchange information on their activities. Apart from the *shanees* in the different *kebels*, leaders of the respective *kebeles* in which the *shanees* are located, the *Abba rejis*, and religious leaders are part of the *wirtu* meeting. The purpose of *wirtu* is not only to exchange information, but also to hear about the results of work that *shanees* in different *kebeles* have conducted during the month. All the members of *rejis* in respective *kebeles* will also gather to hear these reports and possibly present their complaints, if they have any. Those people who are guilty of robbery, breaking the restrictions imposed on the *butta* (forced marriage), and other unwanted behaviors will admit their wrong deeds at this forum and ask for the forgiveness of the general assembly. *Wirtu* is also a forum through which to impose social sanctions on guilty individuals who are not willing to abide by the jurisdiction of the *shanees*. This is to ensure the unanimous implementation of social sanctions throughout neighboring *kebeles*.

In general, *wirtu* is a forum to raise social concerns arising in the society. The assembly of all the *shanees* from different *rejis* and *kebeles* discusses the issue and potential solutions to

overcome the problem. Such solutions can result in norms or informal institutions that the community needs to obey, i.e. *wirtu* serves as a forum of legislation for informal institutions.

Evolution of informal institutions

According to the elders in the study areas (Int. code no. 75, 2015; 100 & 101, 2016), the *shanee* is not new and was used in the *Gada* administration (Hassen, 1994; Jalata, 2012). However, the *shanee* changed from a formal jurisdiction system during the *Gada* administration to an informal institution during the imperial, the *Dergue*, and the current regimes, and it is still an informal institution. In addition to its informality, I have tried to show the marginalization of *shanees* during the imperial and *Dergue* regimes. However, the *shanee* enjoy relative freedom during the current/EPRDF regime.

According to the informants, cases handled by the *shanee* have evolved from time to time during the last 25 years. The original bylaw of the *shanee* system obtained from one of the case study areas, Checka Dimtu *kebele*, Bako-Tibe *woreda*, reveals that issues handled by the *shanee* council have evolved over time, depending on the emerging issues in society. In the initial text, developed in 1999 as a shared document among different *shanees* found in nine neighboring *kebeles* (*wirtu*) of the case the study area, their major focus was on issues related to the theft of assets. The document also includes details on rape and forcing someone into marriage (known in the Oromo language as *buttaa*); unnecessary expenditure on weddings, including extraordinary feasts and dowries paid by the groom; and peace and stability in the area. According to this document, the major focus of *shanees* at that time was exposing robbers and making them pay for the property they had robbed. Besides these fines, guilty individuals would need to admit publicly their wrong deeds and ask the community to forgive them. The document also restricts the movement of people in the village during the night, unless for compelling reasons. It also limits the time farmers can stay in towns. It is specifically stated that "*those moving during the night are robbers*." According to this document, all male community members above the age of 18 years had the obligation to take part in a night patrol, following the guidance by community leaders.

The initial bylaw of 1999 protests *buttaa* and elders engaged in arbitrating between those who committed *buttaa* and the parents of the girls. The document also spelled out restrictions on extravagant wedding expenditures. The document also set the maximum amount of dowry that a

groom should pay and the maximum number of people that would accompany the groom to take the bride. It also specified the fines and final social sanctions against those who did not abide by the jurisdiction of the *shanee*.

The 1999 bylaw was revised in 2003. The revised document maintained the issues articulated in the initial document and included those related to false accusations and witnesses, the abuse of weapons, and the establishment of new *rejis*. Regarding false testimonies, the document showed that some people would make false accusations in court and use unrealistic witnesses to attack each other, which of course violated justice in society. The document also indicated the implications of such unjust practices to society and the need to fight them by exposing those who perpetrated these acts.

With regard to the abuse of weapons, the document indicated that carrying weapons such as spears, knives, or heavy sticks at mass gatherings such as markets, funerals, and wedding festivals predisposes people to murdering each other and create instability. The revised document banned carrying such tools to places of mass gathering and set fines for people who did so. The document also banned firing guns during weddings and funerals, due to the violation of peace and stability in the area.

The other important issue that came out on the revised bylaw was the intention of establishing new *rejis*. Some people tend to establish new *rejis* as a survival strategy when they are found guilty of a certain case, and the *shanee* within their *reji* initiates social sanctions on them. Taking this into account, the revised document placed a restriction of producing clearance from existing *rejis* in order to establish a new one.

The bylaw, revised in 2003, was again revised in 2014. In this version, more *kebeles* were included and the network expanded to the *woreda* level. New issues in the revised document were: banning female genital mutilation, restrictions on the abuse of natural resources, objections against people who use evil powers of sorcerers to disturb the livelihoods of others (and systematically confiscate their property), and unacceptable behavior of rural youth, such as gambling. With the increased influence of non-governmental organizations, activists, and women's affairs offices at different levels, the attention given to harmful cultural practices such as female genital mutilation has increased over time. The influence has gone beyond the formal government system into informal institutions, which are more effective at the grassroots level. In this regard, the document

set penalties for those people who practice genital mutilation as a source of income and the parents who let their children be mutilated. According to this document, those who exposed the people doing the genital mutilation would receive the fine money collected from perpetrators. This means that apart from their social obligation, for which they would be admonished at the *shanee* if they did not report such cases, people would have the financial incentive to expose the mutilators.

The bylaw revised in 2014 strengthened those issues that were included in the first two earlier versions and included some that contributed further to cases of robbery and theft. Among these practices was the excessive engagement of rural youth in gambling. Since gambling involves money, those who indulge regularly may use theft as source of income to finance their activity. Moreover, such people engaged in regular gambling activities will not help their family or contribute to any production activity but rather become a burden to society. The document thus highlighted the need for the parents of such youngsters to advise their children as much as possible and expose them to the community before they reached the stage of engaging in such harmful practices.

Determinants of the effectiveness of informal institutions

The importance of informal institutions varies according to the nature of problems in society and the level of effectiveness of formal institutions to address these problems. I observed that location and proximity to urban centers also influence the effectiveness of these institutions. For instance, the looting of livestock is a more serious problem for farmers in Bako-Tibe than for those in Kersa and Omonada. There was also an incidence of livestock theft while I was conducting the fieldwork in Amarti Gibe *kebele*, Bako-Tibe *woreda*. One of the farmers with whom I conducted an in-depth interview in Cheka Dimtu *kebele* disclosed to me that his oxen had been stolen (Intr. code no. 61, 2015). This farmer mentioned the difficulty he had in taking the case to the court because of a lack of tangible evidence about the robbers. However, the *shanee* found his animals by tracing the robbers in neighboring *woredas*. Due to the severity of livestock theft in Bako-Tibe, and the difficulty in handling cases through the formal justice system, farmers in Bako-Tibe tend to rely on *shanees*. The problem of livestock theft was not a serious problem in Kersa and Omonada *woredas*. As a result, the role of *shanees* in Kersa and Omonada rather concentrates mainly on the

maintenance of peace and stability and protection against rape and other unwanted social behaviors.

While the *shanees* in Bako-Tibe were networked at the wirtu and *woreda* levels, have written bylaws and were very strong, those in Kersa and Omonada were not comparable. For instance, youths in the four woredas surrounding the Gilgel Gibe-I hydro-electricity dam reservoir were engaged in fishing. Several fishery groups were organized, but there was no networked institutional arrangement between them, and the *shanees* in this area were very weak. Every group was competing with others for more fishing rights, leading to a 'tragedy of the commons' situation (Ostrom, Gardner, & Walker, 1994). Finally, conflict broke out between the rival groups. According to an in-depth discussion with a *kebele* leader (Int. code no. 102, 2016), the fishing groups looted and damaged each other's fishing tools and physically attacked each other. Fishing activities were interrupted by the time of the fieldwork for this study. A network of *shanees* in these *kebeles* (like in Bako-Tibe *woreda*) would have been able to prevent such conflicts.

Proximity to urban centers also has an impact on the level of effectiveness of informal institutions. This is mainly because of the tendency that farmers residing around towns, where they are closer to the police, and other formal services tend to use and rely more on these structures. Moreover, those who have relatives or strong linkages with people in leadership positions in government offices tend to disrupt the activities of *shanees*. This happens especially when family members or the person himself is found guilty of a certain case. According to discussions held with an elderly man (Int. code no. 75, 2015), there were cases when *shanee* members had been harassed and put into prison because of initiating social sanctions on a person with close linkages to officials in the *woreda* office.

5.3. Dependencies

5.3.1. The interdependence between formal and informal institutions

As indicated earlier, the indispensable role of *shanees* has made it difficult for past and current governments to contain their activities. However, this does not mean that there was no interdependence between formal and informal institutions during these times as both sought, the support of one another. The formal institution sought the support of *shanees* to handle cases that

were difficult to settle through formal court procedures, because formal judicial tribunals need readily available evidence, which is not always readily available. In such cases, society relies more on its informal institutions. Moreover, *shanees* takes care of emerging issues that may affect the day-to-day lives of the local community but which may not be considered by formal institutions. Understanding the effectiveness of *shanee*s, formal government structures also tend to rely on informal institutions to handle cases such as the maintenance of peace and stability in rural areas. When we see the degree of acceptance of formal and informal institutions in rural areas, farmers tend to consider informal institutions as their own and implement its resolutions in their day-to-day lives (Int. code. no. 60 & 61, 2015).

Beside their jurisdiction role in the community, informal institutions tend to set norms and values in the rural community. For instance setting the maximum limit of wedding expenses and dowries; the rights of women; bans on female genital mutilation; protests against the practices of sorcerers; bans on the abuse of weapons; and limiting the time the farming community stays in urban centers, were depending on the level of concerns created among the rural community. In this regard, I argue that informal institutions are forerunners in addressing the concerns and grave needs of rural communities. This might be taken up by actors in power and modified as formal institutions (Van Assche & Hornidge, 2015). Taking this notion into account, there is a tendency for informal institutions to interplay with formal ones. For instance, cases handled by the *shanees* can be channeled through the *kebele*, which in turn directs them to *Abba Rejis* to deal with the matter. In some cases, the findings of the *shanee* council are also presented to the *kebele* administration before the *shanee* takes punitive action against perpetrators. On the other hand, the *shanees* may also need the support and protection of the *kebele*.

5.3.2. Path dependence in contradictory land policies

Land has never been a private property in Ethiopia (Rahmato, 1984b; Rahimato, 2009c), although there was some form of this in southern Ethiopia during the imperial regime. The imperial government granted free *gult*s (Rahimato, 1984; Stahl, 1974b) to its loyal citizens to use it as a private property, as long as they stayed loyal to the crown. Free *gults* used to be exchanged and used for mortgages; however, the emperor had the right to dispossess free *gult*s whenever the owner of the *gult* right was found to have violated her or his loyalty to the crown (ibid).

The third five-year (1968-1973) development plan of the imperial regime acknowledged the importance of smallholder farming and considered it as its major policy focus (Cohen, 1987; Stommes & Sisaye, 1979). The plan also promoted large commercial farming concerns (Shiferaw, 2014; Stommes & Sisaye, 1979). When the imperial government started implementing the plan, both commercial and smallholder farming activities competed for the same area of land, particularly in the south-central highlands of the country. Since the majority of smallholder farmers were tenants and the land belonged to landlords, the expansion of large commercial farms came at the cost of smallholder tenant farmers. This policy contradiction created mass protests in different parts of the country and contributed to the already inflammatory opposition against the imperial government, which finally came to an end in 1974 (Cohen, 1987; Stahl, 1974).

After the 1974 revolution, private land ownership was officially abolished in the land proclamation of 1976, which limited the maximum area per farmer to 10 hectares and banned land and rural labor markets (Aredo, 1990; Rahimato, 2009; Shiferaw, 2014). The current/EPRDF government has basically continued with the *Dergue*'s land proclamation (Aredo, 1990; Rahimato, 2009; Shiferaw, 2014). However, it has made some modifications that give more freedom to land users to lease their land for a maximum of three years, bequeath use rights to legitimate heirs, and also make the rural labor market free.

Initially, the EPRDF government focused on smallholder agriculture and invested heavily in the agricultural extension system. However, through further policy articulations in 2002, more focus was given to the expansion of large commercial farms (Rahimato, 2011). This policy shift triggered massive investments in commercial farming, particularly in the central highlands of the country. The expansion of flower farms is the best example. However, the growth of large commercial farms, urban settlements, and industrialization in densely populated areas required evicting large numbers of family farmers. As stipulated in the land legislation, the government has the right to evict farmers when the land is deemed important for large investments or public services, after paying the necessary compensation. Proclamation numbers 455/2005 and 456/2005 determined the amount of compensation to be paid to farmers evicted from their holdings. However, there are reports about complaints regarding the amount of compensation paid (Rahmato, 2008). There are two important path dependencies to be mentioned here. The first is the continued state ownership of land throughout the imperial, *Dergue*, and EPRDF regimes. The

second involves repeated policy contradictions that have become permanent points of social and political concern in the country, i.e. the current government's repeated promotion of smallholder and large commercial farming in densely populated areas of the country that challenged state power during the imperial regime. I argue that the development of pull factors or projects that absorb smallholder farmers needs to happen before enacting and implementing policies requiring the eviction of rural households from their land. The creation of sufficient pull factors could encourage rural urban mobility and the evacuation of spaces for large-scale investments.

5.3.3. Path dependencies in accessing input credits

The first comprehensive package programs implemented in Ethiopia targeted smallholder farmers by enticing with packages of improved crop inputs and credit services, among others (Cohen, 1987; Stahl, 1974; Tecle, 1971). However, due to the prevailing land tenure system, in which the majority of smallholder farmers were tenants, it was difficult to enter into contractual agreements with tenants without the consent of landlords. The major challenge was the absence of contractual agreements between landlords and their tenants, meaning that the former could evict the latter anytime they desired to do so. Considering this point, the package projects devised a system in which smallholder farmers fulfilling certain pre-conditions could obtain input credit. The major preconditions were a down payment of 25 percent of the total input value, two guarantors (one of whom had to be the landlord, if the borrower was a tenant), a signed lease agreement between the landlord and the tenant, and group collateral, to enforce group punishment if a member defaulted (Mengisteab, 1990; Tecle, 1971). However, these conditions were prohibitive, given the reluctance of landlords to take responsibility for risky agricultural production and the low financial capacity of tenants to afford the down payments. Evaluation of the performance of the credit program of Arsi Rural Development Unit (ARDU) showed that the ultimate beneficiaries of the program were landlords and landed smallholder farmers, who were able to provide community and individual guarantors, in order to be eligible for the scheme (Cohen, 1987; Rahimato, 1991; Tecle, 1971). From the lenders' perspective, group collateral was very much effective in ensuring high rate of repayment. For instance, the Chilalo Agricultural Development Unit (CADU) enjoyed up to 93 percent repayment success, using a combination of individual and group guarantors. However,

these conditions for input credit were found to exclude tenants, and so CADU had to change its credit policy in order to target better the tenant smallholder farmers (Tecle, 1975).

During the *Dergue* military regime, and in the 1990s during the reign of the current government, farmers received input credits through different arrangements. Currently, micro-finance institutions are responsible for providing this financial service. Microfinance institutions have adopted some pre-conditions, such as group collateral, that have been used by comprehensive package projects such as CADU. Currently, micro-finance institutions use group collateral to ensure maximum rates of repayment. However, resource-poor farmers face difficulties in getting group collateral, and therefore they usually fail to gain access to credit. This means such farmers are failing to get access to improved inputs. Engagement in sharecropping arrangements in which they have to give up at least half of their produce is mainly the result of this problem. As indicated in the characteristics of actors (in sub section 5.2.4.1), Type C farmers are the major victims of this problem.

5.3.4. Path dependencies in grain market stabilization policies and strategies

A review of the policies and strategies adopted by the three Ethiopian governments since 1950 shows path dependencies in attempts to stabilize grain markets. In 1960, the imperial government established the Ethiopian Grain Corporation (EGC) to stabilize grain prices and engage in imports and exports of this crop (Aredo 1990). However, the EGC did not fully deliver its intended mandate of market stabilization, mainly because of a shortage of working capital, a lack of adequate market information, and profitability problems (Rashid & Negassa, 2011). In line with its socialist ideology, whereby it considered producers and consumers exploited by traders and intermediaries, and rising food grain prices following the 1974 revolution, the military government established the Agricultural Marketing Corporation (AMC) in 1976 (Franzel et al., 1989). The major purpose of AMC was stabilization of grain market prices, procurement and distribution of inputs, and the maintenance of the national grain reserve (Degefe & Tafesse, 1990). Until 1979, the government tried to fix grain prices so that the AMC could procure grain at fixed prices from open markets. However, these fixed prices were not attractive enough, and so grain supply to the market fell below an increasing level of demand. The government responded by levying a grain supply quota

on farmers and placing restrictions on the activities of grain traders, in that they were not allowed to move more than 100 kg of grain between regions before the AMC quota had been filled (Degefe & Tafesse, 1990; Franzel et al., 1989). Farmers who failed to meet the grain quota supply would be initially banned from using service cooperative shops that sell basic industrial products and farm inputs, before finally being evicted from their land. As a result, farmers who could not meet the grain quota out of their own production were buying from the open market at higher prices and supply the AMC at very low prices (Franzel et al., 1989). Government market regulations stopped the ability of consumers to get grain from surplus producing areas at better prices, as well as producers' prospects of selling their harvest at better prices to traders and consumers from low production areas. This blockage of grain trade opportunities exacerbated the 1984 famine, because it denied people in drought-affected areas access to grain produced in better production areas. According to Sen's (1981) entitlement theory, such measures devastated the livelihood of producers and consumers and created a condition of entitlement failure. Market regulation discouraged producers from using improved agricultural inputs and destroyed their incentive to produce more (Franzel, Colburn, & Deguet al., 1989). This issue, coupled with recurrent droughts that threatened the country, decreased production leading to supply shortages in the markets. This in turn raised the grain price in the market so that both urban and rural consumers were unable to buy bundles of food with their resources in hand (Sen, 1981; Franzel et al., 1989).

After the downfall of the *Dergue* military government, the AMC was re-established as an autonomous public enterprise operating on the open market and in competition with the private sector with a new name: Ethiopian Grain Trade Enterprise (the EGTE) (Rashid & Asefa, 2007). The mandates of the EGTE upon its reorganization included stabilizing prices, earning foreign exchange through exporting grains, and maintaining a strategic food reserve for disaster response and emergency food security operations. As per its mandate, the EGTE intervened in the maize grain market in 1995/96 and 1996/97, when grain price fell below production costs, by setting floor prices and exporting 48,000 metric tons of maize to neighboring countries. The government revised the mandates of the EGTE through subsequent proclamations in 1999 and 2000, to gradually withdraw it from price stabilization and instead focus on the competitive export of different crops and facilitate the development of emergency food security reserves. However, following the good weather conditions and the better adoption of improved inputs, maize supply to the market increased and its price declined by 80 percent in 2002. In order to rescue the farmers,

the EGTE had to rein back on its earlier mandate of price stabilization to procure as much as possible and export some grain. In the next season, there was a 52 percent decrease in national maize production, mainly because of the low input use due to low grain prices and the late onset of rainfall. This created a situation of food shortage through which about 15 million people would starve if the government and the international community did not respond by importing grain (Rashid et al., 2010; Rashid & Negassa, 2011).

From 2005 to 2008, food prices increased drastically. In response, the government imposed an export ban on cereals, suspended the World Food Program's (WFP) purchases of grain from domestic markets, imported food grain through the EGTE, and re-introduced urban rationing, which had been the major task of the AMC during the *Dergue* military regime (Demeke, 2012; Rashid & Asefa, 2007; Rashid et al., 2010). Since then, the EGTE continued importing wheat grain and rationing it to urban consumers at a 30 percent subsidized rate. Moreover, with the purpose of stabilizing domestic grain prices and providing affordable food to consumers, the government has imposed an export ban on maize grain. Maize export has been banned in 2008, lifted in 2010, re-imposed in 2011(Wakeyo & Lanos, 2015), and has remained in place since then and up to the data collection phase of this study. This has kept the domestic price of maize grain very low (Demeke, 2012). This shows the challenges that smallholder family farming households face by competing with highly subsidized food grain on the one hand and increasing input costs on the other hand, while the price for their produce has been artificially depressed because of the export ban on their harvests.

In a nutshell, the market stabilization efforts of successive governments have clearly marked path dependencies, and their effects on discouraging input use and producers' and consumers' entitlement failure are my points of concern. This point was raised by Franzel et al. (1989) and Reshid et al. (2010), in that policy interventions made by the government to effect market stabilization have shaken market actors' confidence. What was observed during the 1984 famine and the grain supply shortage in 2003, which was believed to be the result of an 80 percent decline in grain prices in 2002, was also the outcome of price stabilization policies. Farmers interviewed for this study, in both Bako and Jimma areas, complained about the depressed price of maize grain and ever-increasing input prices as major sources of food insecurity risk. Some of the farmers also indicated that the government was fixing the market price and expressed their

intention to reduce maize production, mainly because its low price hardly covers input costs (Int. code no. 60 & 61, 2015).

5.3.5. Interdependences between different policies

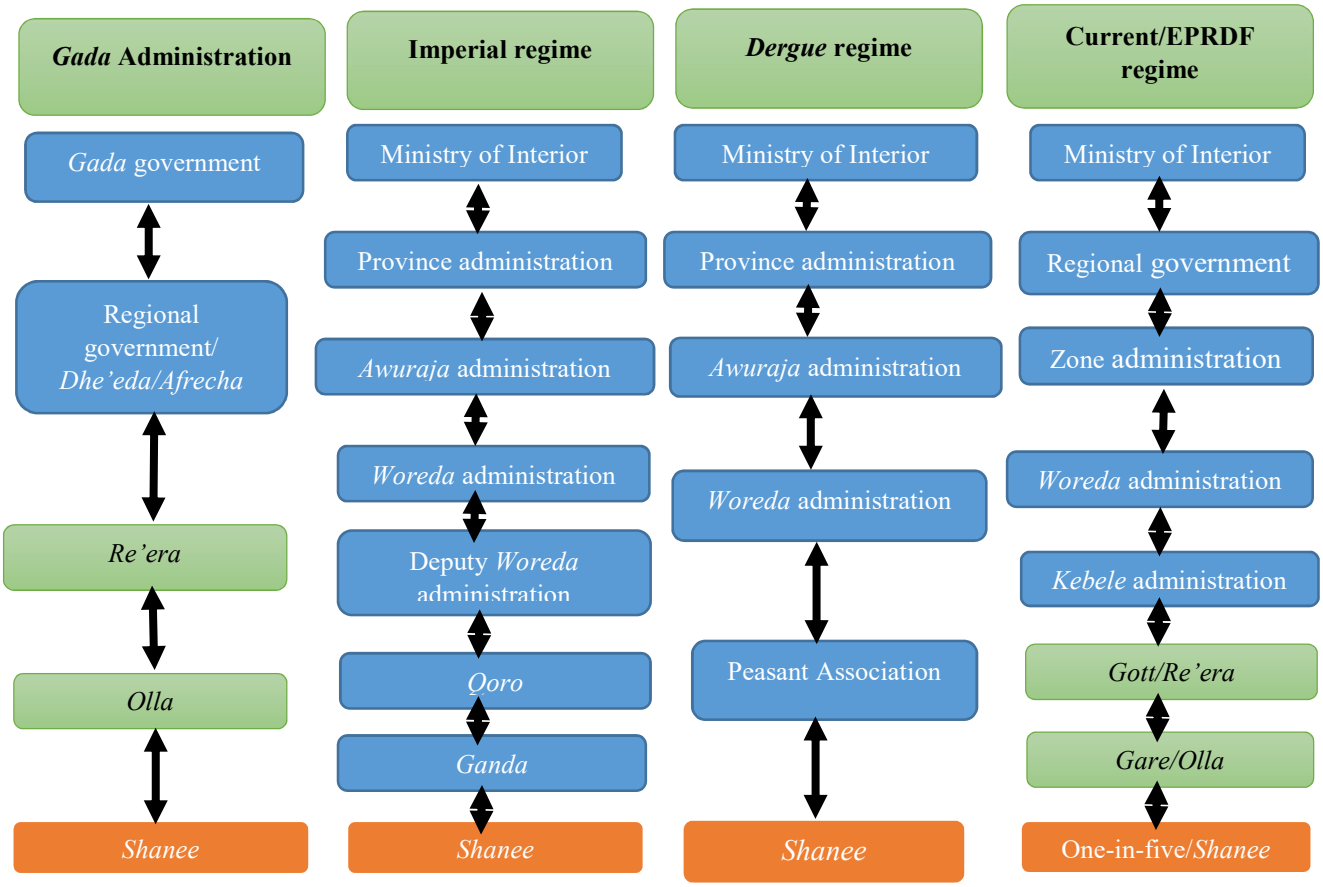
The effects of each of the policies and strategies discussed above rely on the implementation modalities of other policies on the ground. For instance, the major target of agricultural extension policies is to promote 'improved' farming technologies and to increase the productivity and livelihoods of farmers. However, the use of chemical fertilizers and improved seeds, for example, is still far below what is seen in other Sub-Saharan African countries. This has been the case during all successive governments of the country. During the imperial regime, for instance, insecure tenure rights impeded smallholders from investing in new technology and improving productivity (Stahl, 1974; Tecle, 1971). During the *Dergue* regime, the high priority given to state farms and producer cooperatives, and the discouraging effect of centrally fixed grain prices, deterred smallholder farmers from investment (Aredo, 1990; Degefe & Tafesse, 1990; Franzel et al., 1989). After 1991, state market interventions, such as food imports, export bans, and subsidies perpetuated low prices for maize and other grains, discouraging farmers' use of improved crop inputs (Demeke, 2012; FAO, 2014; Rashid & Asefa, 2007). In general, the different rural and agricultural development policies and strategies implemented in Ethiopia in the past, and current policies and strategies are interdependent in affecting family farmers' food security.

5.4. Discussion and conclusions

This study focused on rural governance from the perspective of evolutionary governance theory. The study shade light on evolution of social organizations and government administrative structures, actors and institutions, access to resources, knowledge/power configurations, and their implications for the livelihoods and food security of family farmers.

The evolution of administrative structures in the last four regimes (including the Gada administration) reveals one important trend (Figure 5.5). During the *Gada* administration, the lowest level of formal government structure was the *shanee.* Five neighboring households form a *shanee*, and the *Abba Shanee* (the father of fives), a person selected from the five households, leads

the *shanee.* Five *shanees* form an *Olla*. During the imperial regime, the lowest administrative structure was the *ganda*, divided into three *shanees*, each coordinated by a person again known as the *Abba Shanee*, who was responsible for the coordination of 200-300 households. However, unlike counterparts in the *Gada* administration, imperial-era *Abba Shanees* were not concerned with the day-to-day activities of households; rather, they concentrated on tax collection and the maintenance of the peace and stability. In a similar manner, the local community called the seven-members of the executive committee of PAs during the *Dergue* regime *Abba Shanees*, who were also responsible for coordinating up to 200 households. The current government introduced new forms of formal social networks, known as one-in-five and *gare*, after the election season in 2010. The community again called the leader of a one-in-five the *Abba Shanee*. Despite differences in the roles during different regimes, the local community has continued to use the name *shanee* throughout. This was the mechanism of the local community used to preserve its original social organizations. The interesting thing in this regard is the re-emergence of the original *shanee* through the name one-in-five, without mentioning that it is derived from the *Gada* system. This created a negative impression, though, since a one-in-five was considered an imported form of control mechanism employed to monitor the socio-political activities of each citizen. This was partly because of the political affiliations (mainly affiliated to the ruling party) of leaders of one-in-five groups and their role in the society. However, elders in the study areas explained that "one-in-five/*shanee* is not a new form of social network. It has been there since our ancestors. It is rather the re-emergence of the oldest form of social organization." According to Megersa (1993), a *shanee* was a very powerful social network in the *Gada* system, which is used to mobilize society towards a certain goal. The current government tried to make use of this powerful social network for political and development activities.



Source: Own sketch

Figure 5.5: Summary of the administrative structure and revival of *shanees*

Three important categories of family farmers, namely Type A, Type B, and Type C, are officially differentiated through periodic ranking in the study areas. This ranking is based on criteria such as the use of a full package of technologies, extension contacts, market orientation, political participation, and the capacity and willingness to share their experience with other farmers. This could be with the intention to target different types of farmers with different technology packages depending on their reception capacity. However, such categories and previlages given to model farmers, and the neglect of Type C farmers especially in their access to finanace has created unintended outcomes. Analysis of results in this study show a widening power-knowledge relation in the study areas due to the difference in access to extention, rural financial services and political participation by farmers in the different categories. Those who have better access to resources and services are becoming more affluent and more influential at the

expense of the resource poor farmers especially because of their lack of access to rural credit that compels them to get into share cropping arrangmens. This shows a need for focused intervention to address access to finance by poor farmers, in order to improve their input use, and food security.

Shifts in state power are central to the changing roles of actors and institutions in rural Ethiopia. During the *Gada* administration (pre-imperial period), the *shanee* council was the formal institution responsible for the day-to-day governance of local communities. However, its role as a formal institution ceased with the inclusion of the southern parts of Ethiopia into the central administration of the imperial government. This witnessed the role of state powers in defining the formality of institutions (Van Assche & Hornidge, 2015). However, despite the fact that the imperial government put all powers under the central government, the local community continued using the council of elders under the umbrella of its self-help local organization, the *reji/iddir*. *Reji* has two distinct councils, known as the *arfe* and the *shanee*. The *shanee* council under the umbrella of the *reji* continued the role of legislating and implementing informal institutions of the rural community, depending on social dynamics in different areas. In addition to the *shanees* under the umbrella of the *reji*, rural communities currently use different levels of councils of elders, known as *Jarsa biyya*. I learned that two major levels of *jarsa biyya* were operational in the study areas. The first one is responsible for resolving conflicts between and within households, due to daily social interactions and resource (e.g. land) use. The rural community sets up such councils of elders as the need arises. The second level of *jarsa biyyas* is responsible for resolving higher levels of conflict, which might have involved human life, or issues that are beyond the jurisdiction of the first level of *jarsa biyyaas* or the *shanees* operating under the umbrella of the *rejis.* This level of *jarsa biyya* is a council of five or nine elders, who are usually found at the *kebele* level. Despite their diversity, all councils of elders represent informal institutions that are legislated depending on the social dynamics in the community to address issues that are not yet covered by formal institutions. They also focus on issues that cannot be taken care of by formal institutions, perhaps due to lack of evidence.

In areas where there is strong *shanee* activity (e.g. Bako area), there is a network of *shanees* known as *wirtus*. I came across a *wirtu* of nine *kebels* that meets in a small market village known as *Shoboka*. One member represents all *Shanees* in a given *kebele* at the *wirtu*, the latter of which is a forum for exchanging information, evaluating the performance of each *shanee*, and legislating

informal institutions. I had the privilege of viewing the bylaws of the Shoboka *wirtu*, which had been revised twice, in 2003 and 2014, since they were developed in 1999. Revisions were made to incorporate more institutions that needed to be implemented in the area to address different social concerns. Revision of the bylaws is a good indication of how informal institutions co-evolve with the social dynamics in society.

The effectiveness of institutions was not uniform in all of the study areas. I understood that informal institutions are implemented more effectively in areas where their formal counterparts cannot effectively guide the social behavior of the rural community. This depends on the distance away from urban centers, where government structures and actors running these formal institutions are abundant. In rural communities located near to urban centers, farmers tend to rely more on the formal institutions than the informal. The effectiveness also varies with the nature of the problem faced by the community. For instance, those facing more frequent robberies of livestock rely more on informal institutions to protect their property. The activity of *shanees* was very strong in these areas, because it was not easy to get evidence on the robbers.

I observed interdependence between formal and informal institutions in the study areas. As indicated in the last paragraph, informal institutions tend to address issues that formal institutions cannot handle due to lack of evidence, while informal institutions are stronger in mobilizing the rural community around a certain task. Due to these merits of the informal institutions, the formal ones tend to rely on them for certain issues. There were cases, for example, where government structures tended to make use of the informal institutions operating under the umbrella of *reji* and *jarsa biyyas* to handle cases related to peace and stability of the rural community. The role of informal institutions in maintaining peace and stability, enforcing women's rights, fighting against false accusations and false testimonies, and similar activities complements the conservation of law and order by formal institutions. Informal institutions also need protection by actors running the formal institutions in cases where they handle issues that involve aggressive individuals that may physically attack members of the council of elders. Strengthening the activity of councils of elders in the legislation, and implementing informal institutions that address problems, might be a short cut to maintaining law and order in rural areas.

Path dependencies exist in contradictions within land policies, conditions for access to credit, and agricultural marketing policies. These policies are not only path-dependent, but also

interdependent whereby the effect of one policy exacerbates the negative effect of another. The negative effects of these policies have contributed to the food insecurity and famine incidences the country has suffered to date, and their effects contributed to the downfall of the past two regimes. It is a wise step to look back and take corrective measures in relation to the policies and plans of the country. More specifically, land policy that evicts smallholder family farmers without enough compensation to cover the damage inflicted to their livelihood and social welfare needs proper consideration. This is because such policies expose several family-farming households to food insecurity and destitution.

As indicated in the previous paragraphs, Type C farmers lack access to finance, mainly because they are not creditworthy and cannot provide group collateral, which the micro-finance institutions require as a basic lending criterion. If these households are left in the 'business as usual' scenario, millions of them will languish in the poverty trap while just a few progressive farmers will continue enjoying wealth and prosperity. This situation also erodes their resilience and increases their vulnerability to chronic food insecurity. There is therefore a need to consider a social security program that addresses poor family farmers in the so-called 'surplus-producing' areas of the country, including the study areas, in order to rescue many family farmers that are already categorized as Type C. It would also be wise to look into the market stabilization policies of the country that promote the distribution of subsidized wheat grain and use of subsidy free chemical fertilizer and certified seeds. This means domestic farmers are compelled to compete subsidized, imported grain with grain whose production costs are already inflated due to very expensive inputs. This may have a strong long-term effect on input use and productivity and may eventually cause the entitlement failure to both family farmers and consumers (Stommes & Sisaye, 1979; Sen, 1981; Kuma, 2002; Rashid & Negassa, 2012).

6. Perceptions, Assessment, and Management of Food Insecurity Risk among Family Farming Households in Southwestern Ethiopia

6.1. Introduction

The history of famine and food insecurity in Ethiopia dates back to 253 BC (Webb & Von Braun, 1994b). Nearly all famines and food insecurity problems have happened following consequent years of drought (Bewket, 2009; Webb & Von Braun, 1994). Taking the situation since the 1960s as a case in point, efforts to increase domestic grain production did not result in the intended outcome, mainly because of problems in policy design and implementation (Aredo, 1990; Rahimato, 2009; Von Braun & Olofinbiyi, 2007). During the late imperial regime, food production was based largely on a tenant-landlord relationship, which was rather prohibitive for technology adoption. The focus of the *Dergue* government (1975-1991) was also on producers' cooperatives and state farms. Market restrictions, grain supply quotas, and centrally fixed prices were obstacles to the inter-regional distribution of food throughout the country, thereby fueling food insecurity in general and the 1984 famine in particular (Rahmato, 2009). Since 1991, the EPRDF-led government has set up huge smallholder-based agricultural extension program to help foster the adoption of improved technologies. To reduce structural food insecurity, the government has been working on a productive safety net and other complementary programs in drought-prone and food insecure areas of the country. Though improvements have been witnessed in building the resilience of households, food insecurity is still a persistent problem, in its many different dimensions. In 2015, for example, over 10 million households were threatened by food insecurity after severe droughts, which were exacerbated by the El Niño weather phenomenon (NDRMC, 2015). Apart from weather and climate conditions, path dependencies in agricultural policies and market structures have also negatively affected technology use and productivity in agriculture.

This chapter focuses on the major sources of food insecurity of risks, the perceptions of family farmers on these risks, their assessment and management strategies. Understanding how farmers perceive, assess, and manage these risks helps in the design of practical solutions to address household food insecurity. This study applies an evolutionary risk governance framework to analyze and explain the linkages between the perceptions, assessemtn and management of food

insecurity risk. Three major categories of risk, namely climate-related risk, crop and livestock diseases, and institutional risk related to markets, influence household food security among family farming households in the study areas. These risks are interdependent, with one exacerbating the effects of the other. The impacts of certain risks pronounce local inequalities among family farmers. Family farmers use different strategies to cope with and adapt to the different sources of risks. However, some institutional and market-related risks make these strategies difficult to implement.

The design of feasible interventions to improve the food security situation of family farmers needs understanding the risk perceptions, assessments, and management strategies of farmers, as well as the underlying causes that created these perceptions and practices in the first place. It is essential to understand that the farmers' risk governance practices are the outcomes of an evolutionary process that involves interactions between different institutions, actors, and knowledge.

6.2. Perceptions, assessments, and management of food insecurity risk

This section is divided into three subsections. The first analyses the perceptions of family farmers about the different sources of food insecurity risk. The second presents assessments of sources of food insecurity risk by individual family farmers and groups of people in different communities, while the third subsection presents risk management strategies employed by family farmers.

6.2.1. Perceptions of family farmers about the different sources of risks

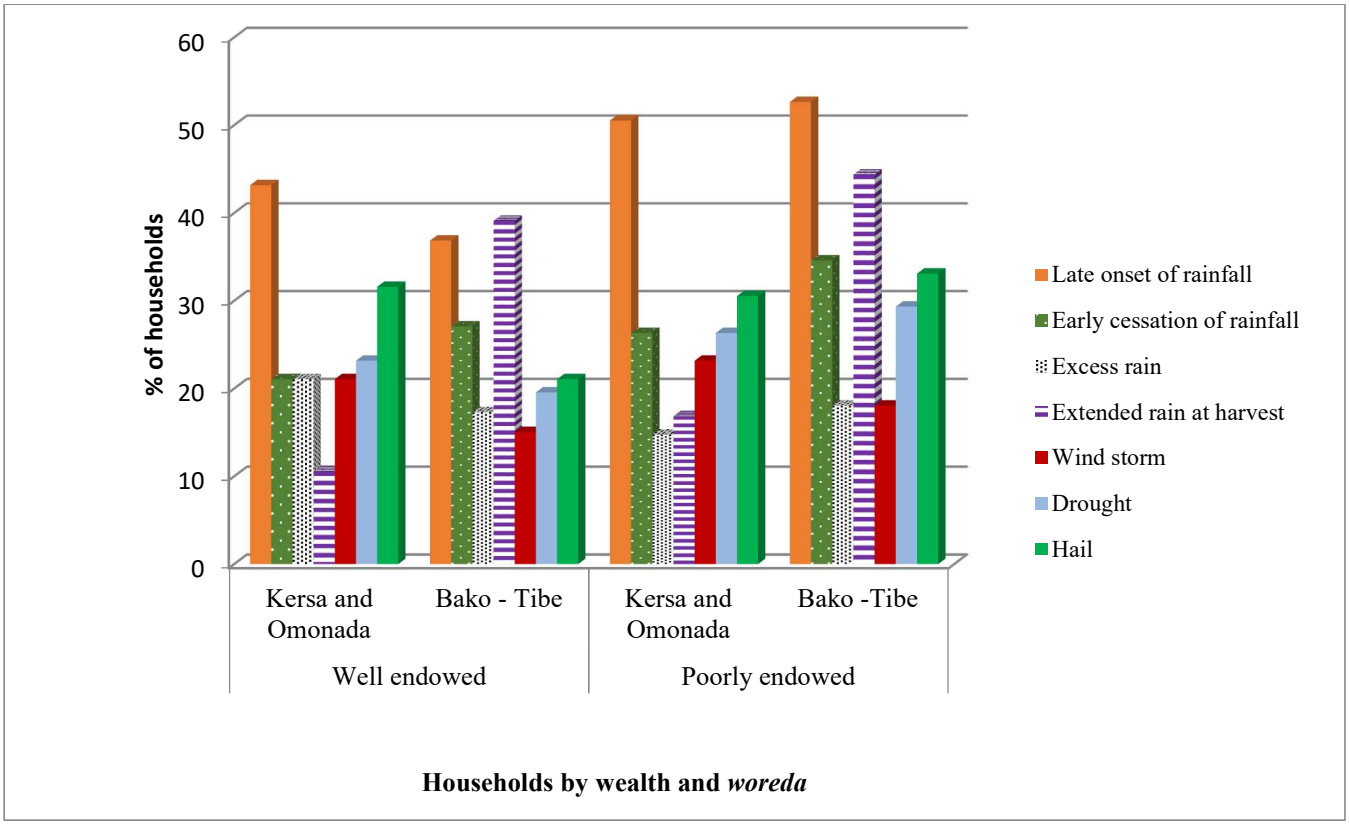
Perceptions of food insecurity risk due to climate variables

The literature (e.g. Bewket, 2009; Webb & Von Braun, 1994) shows that most of the food insecurity and famine shocks in Ethiopia are associated with drought and other climate-related variables. It is therefore crucial to understand how family farmers perceive changes in climate variables and their consequences. The climate variables considered in this category include the late onset and early cessation of rainfall, too much rainfall, extended rain at crop harvest time, wind and hailstorms, and extended droughts (Figure 6.1). Results of the household survey show that

almost all of the sampled family farmers in the study area have experienced shocks from at least one of the climate-related sources of food insecurity risk in the last 10 years.

Among the sample households, about 90 percent had experienced the late onset of rainfall at least once in the 10 years prior to the survey. The work of Gloede et al (2015) indicated that people's risk perceptions are influenced by their exposure to similar shocks in the past. In line with this notion, analysis of the household survey data revealed that the previously described 90 percent of farmers perceived this climate variable as an important source of food insecurity risk. When explaining why they perceive late onset of rainfall as important source of food insecurity risk, they stated that late onset of rainfall elongates the dry season, creates problems with feeding and watering livestock, and also delays crop planting time. An elderly farmer in Cheka Dimtu *Kebele* of Kersa *woreda* (Intr. code no. 65, 2015) explained that "delayed rainfall means a shorter growing season that requires planting early-maturing maize varieties. However, we cannot change the maize variety according to weather conditions. This is because we express our seed demand ahead of the growing season. Certified seed is not easily available, and it is expensive to make changes when the onset of rain comes late." Family farmers normally buy certified seeds of high-yielding maize varieties (e.g. BH 660) before the rainy season. With delayed rains and shorter growing seasons, the appropriate crop variety is the early-maturing type (e.g. BH 543 of maize); however, seeds for the next season are ordered ahead of time, and it is impossible to change varieties according to sudden climactic changes.

Household survey data reveal that 55 percent of the sample farmers had experienced shocks from the early cessation of rainfall at least once in the last 10 years, and the same proportion perceived it as a source of food insecurity risk. The impact of this source of risk depends on how much the plant grown at the point at which the rain terminates. When the rain stops before the grain-filling stage, total crop loss can occur. According to the discussions with my informants, the worst food insecurity scenario happens when a late onset of rainfall is followed by an early cessation (FGD code no. 4). However, the likelihood of such a coincidence is low. This happened in the study areas only once, in 1983, and resulted in the great famine of 1984. However, similar instances were reported in 2015/16 in some parts of Ethiopia (NDRMC 2015).



Source: Computed from own survey data

Figure 6.1: Perceptions of farmers on climate-related risks

Both low and excess rainfall can cause food insecurity risks to family farmers. About 35 percent of the interviewed family farmers had experienced a food insecurity shock at least once in the previous ten years because of excess rainfall. These farmers perceive excess rain as a source of food insecurity risk. However, they (FGD. Code no. 6, 7 and 8, 2015) indicated the degree of the problem varied with the amount of rainfall and soil type in the area. Family farmers in areas with waterlogging problems (e.g. resettlers in Kersa and Omonada) perceive the risk to be highest when the volume of rainfall is very high, which happened in 2008. As per discussions with the informants, crops suffer most when it rains continuously without intervals of sunshine (FGD code no. 5 and 6, 2015). Excessive rainfall also causes floods and loss of fertile top soil. Studies conducted in the Gilgel Gibe-I watershed (Demissie et al., 2013) showed that farmers can lose up to 39 tons/ha of top soil per annum due to water erosion.

As indicated in Figure 6.1, a higher proportion of farmers in the Bako-Tibe *woreda* perceived extended rain at harvest time as a source of food insecurity risk than farmers in the Kersa and Omonada *woredas*. This could be because farmers in Bako-Tibe *woreda* were experiencing heavy rainfall when the interviews for this study were conducted at maize harvest time. They also explained that they had experienced the major extended drought that caused famine and food insecurity in 1984.

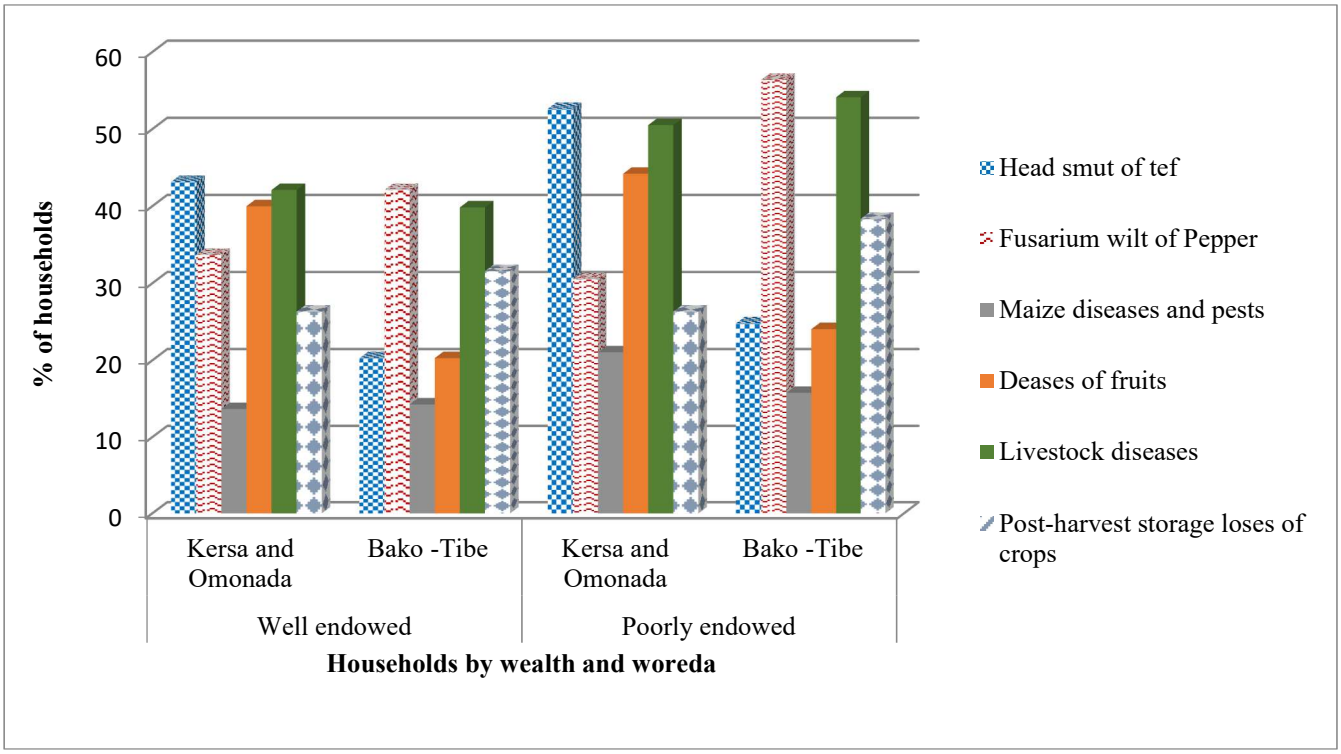
About 54 percent and 37 percent of the sample farmers, respectively, had experienced food insecurity shocks due to hail and wind storms at least once in the previous 10 years. These farmers perceived hail and wind storms as sources of food insecurity risk, because they devastate crops and other assets.

The perceptions of family farmers on food insecurity risk related to climate variables varied according to their wealth category (Figure 6.1). This is largely because crop production in the study areas is rain-fed with a high dependency on precipitation peculiarities. Poorly endowed households have fewer resources to tolerate crop failure and are hence more vulnerable to food insecurity problems due to risks related to climate variables. Bad climatic conditions may cause yield reductions or total crop failures that might result in food shortages. As a result, a higher proportion of poorly endowed households perceived almost all climatic variables as sources of food insecurity risk than wealthier farmers.

Perceptions of food insecurity risk due to crop and livestock diseases

Farmers in the study areas indicated a large number of crop and livestock diseases as sources of food insecurity risk. However, the focus here falls on *tef* head smut, fusarium wilt of pepper, maize diseases and pests, post-harvest storage losses, and livestock diseases (Figure 6.2). Head smut of *tef* is the most serious crop disease in the Kersa and Omonada *woredas*. Analysis of the household survey data reveals that 98 percent of the sample farmers had experienced the shock of *tef* head smut at least once in the previous 10 years. These farmers perceived that it was an important source of food insecurity risk. However, since the incidence of the disease is lower in the Bako-Tibe *woreda*, only 44 percent of the farmers in this area perceived it as a source of food insecurity risk. In the last five years, *tef* head smut occurred almost every year in Kersa and Omonada *woredas*,

but only once in Bako-Tibe area. Elders in Kersa and Omonada *woredas* explained that it had become more severe after the Gilgel Gibe-I hydropower dam reservoir filled with water in 2003. Experts associate this with increased humidity in the area, which is conducive to encouraging the disease (Intr. code no. 35, 2015). In addition to location, the perceptions of *tef* head smut varied according to the wealth category of farmers (Figure 6.2), with a higher proportion of poorer farmers perceiving it as a source of food insecurity risk.



Source: Computed from own survey data

Figure 6.2: Perception of farmers on crop and livestock disease related risks

Red pepper is an important cash crop in all the study areas. However, the disease known as fusarium wilt attacks it. Farmers believe that run-off and flooding cause fusarium wilt, because the disease spreads following the entry of floods into their fields. The incidence of the disease varies according to location. For instance, about 98 percent and 64 percent of farmers respectively in the Bako-Tibe *woreda* and the Kersa and Omonada *woredas* had experienced it at least once in

the previous 10 years and perceived it as source of food insecurity risk. Looking into the different wealth groups, a higher proportion of poorly-endowed farmers perceived fusarium wilt of pepper as a source of food insecurity risk than their wealthier counterparts (Figure 6.2), possibly due to the fact that pepper is an input-intensive crop that needs large amount of fertilizer compared to other crops (Minot & Sawyer, 2013).

Diseases such as maize lethal necrotic disease (MLND) and the gray leaf spot virus (GLSV), and pests such as the maize stalk-borer, attack maize. An MLND outbreak occurred in the fields of seed companies in the 2014/2015 season and devastated hybrid maize varieties, which eventually caused a shortage of seed for some varieties. As a result, the research and extension system tried to create awareness of the symptoms of MLND among farmers, encouraging them to report its occurrence to the nearest extension agent. However, the information provided on MLND among farmers was not clear enough, and instead they reported other diseases such as GLSV instead of MLND. The reality was that MLND was not diagnosed in the *woredas* during that growing season. This shows non-knowledge of (GLFV in this example) and incomplete knowledge of the source of risks (MLND in this case) creates over excitement and frustration among the farmers. A comparison of the proportion of farmers in the two wealth categories (Figure 6.2) shows that more of the poorly endowed farmers perceived maize diseases and pests as sources of risk to their food security (Figure 6.2). This is because maize is the major staple food in the area, particularly for poorer people. Crop failure or a reduction in yield will directly affect the food security of poor farmers that may have no alternative accessing other food grains.

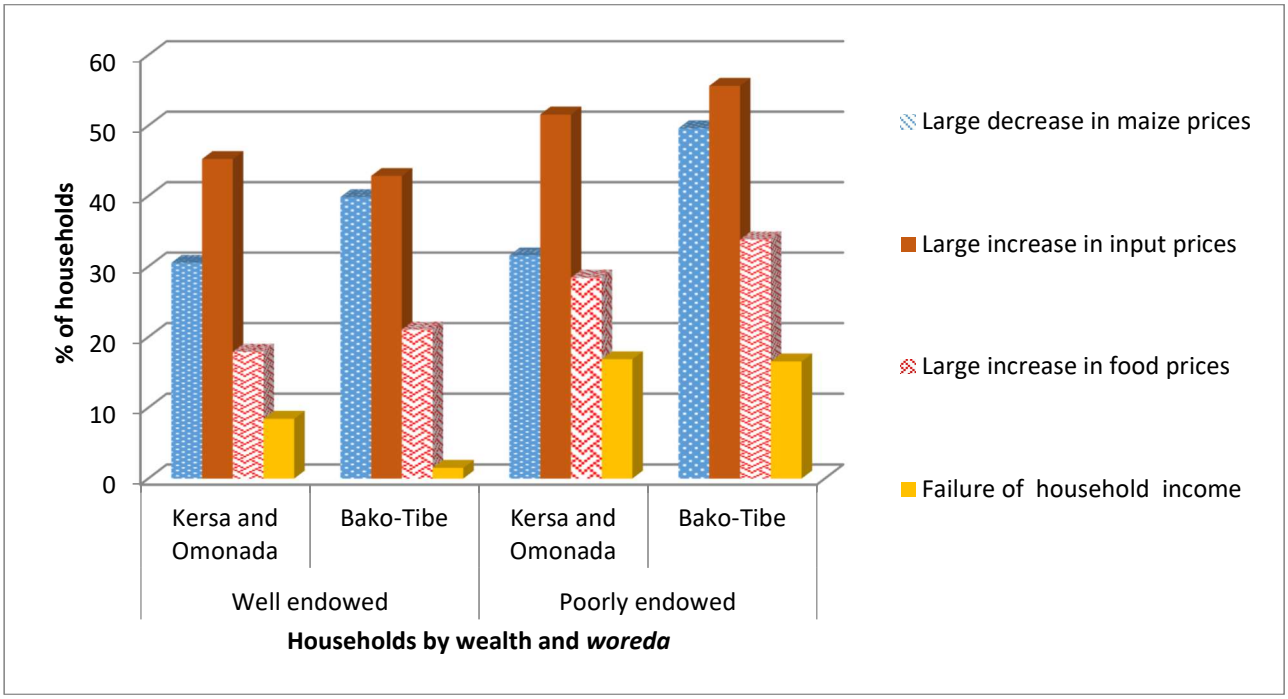
Post-harvest losses of crops due to weevils, rodents, and other storage pests were mentioned by about 60 percent of the family farmers as an important source of food insecurity risk. Ultimately, farmers expect risks of post-harvest losses every year, up to and including total damage of the harvested crops.

Livestock is an integral part of the mixed crop-livestock farming systems in Ethiopia and livestock diseases are sources of grave risks to family farmers' food security. About 93 percent of the interviewed family farmers perceived livestock diseases as important sources of risk for their household food insecurity. The proportion is even higher for poorly endowed farmers than for well-endowed farmers (Figure 6.2).

Perceptions of prices of agricultural inputs, outputs, and food

Three interrelated sources of food insecurity risk, namely large decreases in maize prices, and large increases in inputs and food prices, are identified in this category of risk. Family farmers in the study areas have suffered from tough price fluctuations in the past, and they expressed their uncertainty about future prices, too. About 78 percent and 98 percent of the total sample farmers perceived large decreases in maize prices and large increases in input prices, respectively, as important sources of risk to their food security.

As shown in Figure 6.3, a higher proportion of poorly endowed households perceived large decreases in maize prices and large increases in input prices as sources of food insecurity risk. A model farmer in Checka Dimtu *kebele*, Bako-Tibe *woreda* (Inter. Code 61, 2015), exemplified the situation. After harvesting in November, would normally store maize, in order to wait for better prices in July and August, though on this occasion it was not successful: "Maize prices are usually declining while the cost of fertilizer and improved seeds are increasing. We are at a point where we have to reduce maize production" (Inter. Code 61, 2015).



Source: Computed from own survey data

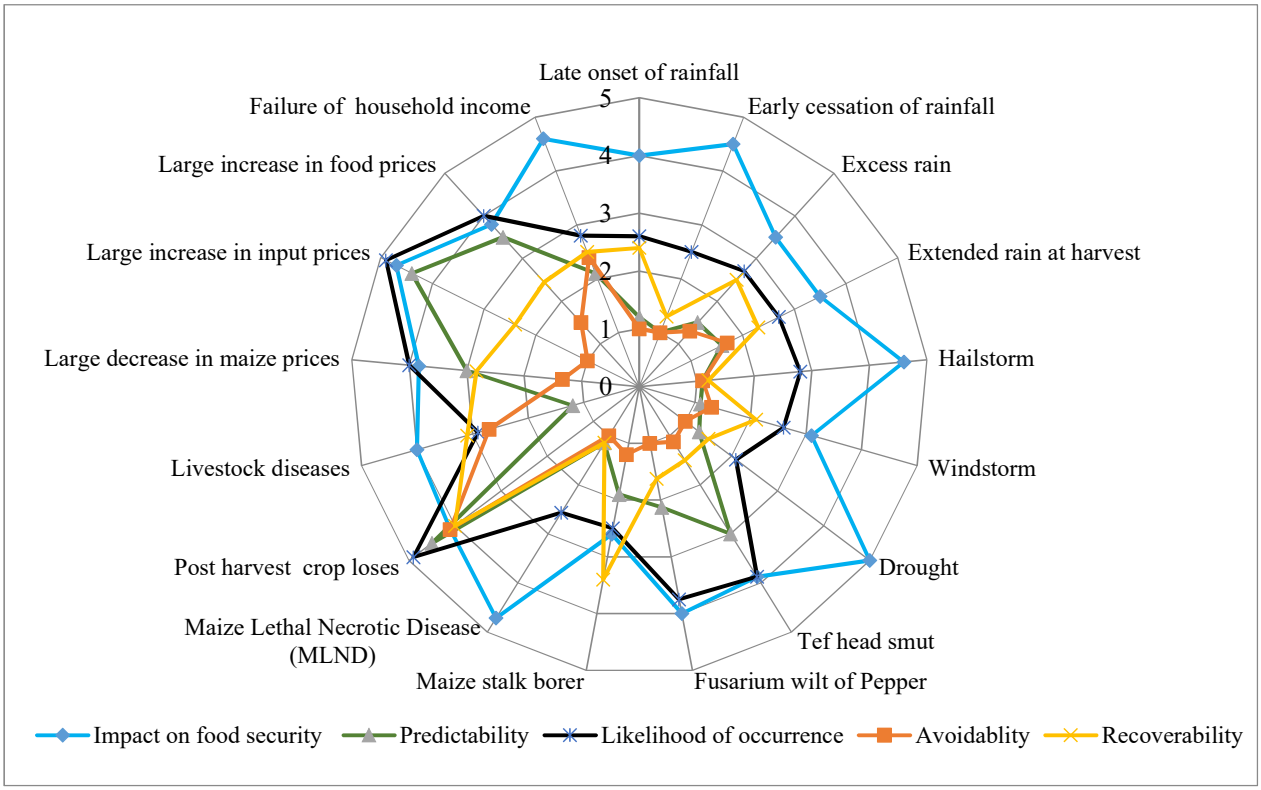
Figure 6.3: Perception of family farmers about sources of risks related to input, output and food prices

Farmers in the study areas perceived that the government was supporting low grain prices to protect urban consumers. In fact, the government influences grain prices in different ways. For instance, an export ban on maize, aligned with the distribution of imported grain at subsidized rates, keeps domestic grain prices relatively low (Demeke, 2012). The influence of government interventions on domestic markets occurs through the activities of the Ethiopian Grain Trade Enterprise (the EGTE), which has purchase points in different *woreda* towns across the country. The price determination follows certain procedures. The EGTE conducts its own market assessment, announces its purchase prices at the purchase points, and invites all suppliers that can supply a certain minimum amount of grain to do so, albeit with certain quality parameters. Traders decide on their transaction costs and profit margin and determine prices at which they will buy from producers, based on the price determined by the EGTE. Government intensions in lowering grain prices is to satisfy the needs of millions of urban and rural poor consumers. The military *Dergue* government, through its Grain Marketing Corporation, used similar low-maize price approaches, which illustrates path dependence in the Ethiopian maize marketing system. However, low prices for maize come at the cost of maize-producing family farmers becoming uncompetitive and forcing them to dis-adopt technologies, which eventually results in decreased production (Rashid & Negassa, 2012). This in turn promotes supply shortages and food insecurity, as was the case in 2003 (Rashid et al., 2007). Though farming households are both producers and consumers of maize, the decline in grain prices means a decline in the selling power of their produce. Family farmers in the study areas usually buy *tef*, pulses such as beans, edible oil, sugar, and other processed products. Unlike the prices for maize, the prices of these food items increase every year. As a result, about 51 percent of the interviewed farmers perceived large increases in food prices as a source of food insecurity risk. A higher proportion of poorly endowed than well-endowed households had this view (Figure 6.3).

6.2.2. Multi-criteria assessment of sources of risk

Once a family farmer perceives a certain source of food insecurity risk, she/he assesses that risk from different perspectives. Farmers have different evaluation criteria, depending on their own contexts. The risk evaluation criteria of individual farmers and the community coevolve with the nature of the risk. Experiences with different institutional arrangements and the actions of different

actors during the past food insecurity shocks have influenced the way individual farmers and communities assess differently perceived sources of food insecurity risk. As a result, farmers tend to assess certain perceived risks from different perspectives. In this study, I tried to capture farmers' multi-criteria group and individual risk assessments and summarize them in a spider's web graph (Figure 6.4). A multi-criteria assessment was made in 10 small focus group discussions. The criteria used in the group assessment were impact on food security, predictability, likelihood of occurrence, avoidability, and recoverability. The assessment was made in terms of ranking each of the identified sources of risk on a scale between one and five. The definition of the scales for each criterion is given in the discussion of each criterion. Each of the criterion is represented by specific loops which move across the axis of specific sources of risk in the spider's web graph in Figure 6.4. Individual assessments were conducted through a questionnaire interview as part of the household survey, which focused mainly on the impact of different sources of risk on household food security and social welfare.



Source: Computed from own survey data

Figure 6.4: Multi-criteria assessment of sources of risks to family farmers' food security

Impact on food security and social welfare[11]

The group assessments on rainfall-related sources of food insecurity risk show that the highest risk of food insecurity is perceived due to extended drought, followed by hailstorms, and then the early cessation and late onset of rainfall. Extended drought is a source of risk that is perceived to have the highest impact on household food security (Figure 6.4). The huge impact of extended droughts is usually preceded by the late onset and early cessation of rainfall. Hail and windstorms follow one another and destroy crops and other physical assets, thereby contributing to food insecurity in different ways. It was understood from the group discussions that impacts of hail and windstorms are usually limited to certain localities within a given area. For example, hailstorms usually attack the resettlement location in the Kersa *woreda*, while the surrounding community remains unaffected (FGD, code no. 6, 2015).

Group assessments showed that extended rain at harvest times, and excess rainfall during the plant-growth season, were perceived to have a high impact on family farmers' food security (Figure 6.4). On the other hand, the individual risk assessments rated the impacts of extended rainfall at harvest time on food security higher than drought. This could have been because of the coincidental extended rainfall at maize harvest time while the interviews for this study were in progress. Individual assessments revealed differences between poor and well-endowed family farms in how they viewed extended rainfall at harvest time. Poor farmers rank extended rain at harvest higher than the well-endowed households in all the study sites.

The group and individual assessments revealed that large increases in the prices of agricultural inputs (mainly fertilizer and improved seeds) had stronger negative impacts on household food security than other sources of risk. As a result of massively increasing input prices, many poorly endowed households in the study areas were unable to afford these inputs, thus spurring a downward spiral toward sharecropping agreements or renting out their farmland.

Both the group and the individual risk assessments revealed that family farmers perceived large increases in food prices as important contributors to their household food insecurity. This was the case for both poor and well-endowed households. Studies in the Jimma area by Hadley et al. (2009), on the impact of the global food crisis on household food security and intra-household

[11] Impact on food security and social walfare: 1=Not important (very low), 2= Not so important (low), 3=Average, 4=Important (high), 5= Very important (very high).

inequalities, also support these findings. Since Ethiopia is part of the global grain market and it imports a substantial amount of grain (especially wheat) and chemical fertilizer, food and input prices may also be linked to the effects of globalization. However, while wheat prices are highly subsidized, there is no subsidy on fertilizer, in order to keep inflation low for food prices and to protect consumers. However, the depressed price of grain, produced using costly fertilizer, discourages smallholder farmers and eventually leads to decreased input use and an associated reduction in food production (Demeke, 2012; Rashid & Negassa, 2012).

Predictability[12]

Predictability is related to Beck's temporal delocalization of risk, which is about the degree of knowledge and non-knowledge thereof (Beck, 2002, 2006b). In this study, predictability is taken as a criterion to explain how far the occurrence of a certain risk can be estimated ahead of time. It is knowledge about the anticipated source of risk. A predictable risk is a risk, about which there is more knowledge than non-knowledge (Hornidge & Scholtes, 2011). The results of the group assessments show that large increases in input prices and post-harvest storage losses are the most predictable sources of risk for family farmers' food security (Figure 6.4). In addition, farmers usually expect higher prices for fertilizer and improved seeds during the main crop seasons, and large increases in food prices are highly predictable, too.

Post-harvest storage losses (Figure 6.4) can have a high impact if precautionary measures are not taken. As illustrated in Figure 6.4, *tef* head smut has a moderate level of predictability. However, deeper analysis of the group assessments in the three case study *woredas* reveals that predictability of *tef* head smut is low in the Bako-Tibe *woreda*, where the incidence of the disease is low and is very high in the Omonada and Kersa *woredas* (FGD code no. 15-17, 2016).

[12] Predictability: 1= Not predictable, 2= Difficult to predict, 3= Average, 4=predictable, 5= Highly predictable

Likelihood of occurrence

The likelihood[13] of occurrence of a certain source of risk relates to the probability of that risk. Family farmers can estimate the chances of a certain risk depending on their access to different sources of information and the history of the risk. According to the community risk assessment summarized in Figure 6.4, post-harvest storage losses followed by large increases in input prices have a very high-perceived likelihood of occurrence. This means that storage pests will always damage crops if proper treatment is not made beforehand. The very high likelihood of occurrence of large increases in input prices shows the sustained concerns among farmers about the soaring costs of crop inputs. The likelihood of occurrence of large decreases in maize prices is also high, next to input prices. According to the group assessments, there is a high likelihood of occurrence of *tef* head smut in Kersa and Omonada areas. Though it is not revealed on the spider graph, the high likelihood of occurrence of *tef* head smut is limited to the Kersa and Omonada *woredas* since it is associated with the Gilgel Gibe dam, which both the community and experts believe has increased relative humidity in these areas.

Avoidability

Avoidability[14] refers to whether a given source of risk could be diverted from affecting or influencing a household, a community, or a nation by taking some precautionary measures (McDaniels et al., 1995). Furthermore, it forms the basis of mitigation and adaptation measures for different sources of food insecurity risk. Community assessment shows that the effects of post-harvest storage losses, as well as human and livestock diseases, are perceived by family farmers to be relatively avoidable, since there are treatments available for the major human and livestock diseases and pests. The effects of other sources of food insecurity risk are perceived to be relatively unavoidable.

[13] Likelihood of occurrence: 1=No likelihood, 2= Low likelihood, 3=Average, 4= High likelihood, 5=Very high likelihood.

[14] Avoidability: 1=Not avoidable, 2= Difficult to avoid, 3=Average, 4=Avoidable, 5=Highly avoidable

Recoverability

Recoverability[15] refers to the difficulties involved in recovering from the effects of a certain source of food insecurity risk. As shown in Figure 6.4, post-harvest storage loss of crops is the most recoverable food insecurity risk. This is because the grain could be treated before it is totally attacked by pests. Maize stalk borer does not cause total damage and its effect is perceived to be slightly recoverable compared to other sources of risk.

It is very difficult for family farms to recover from the effects of most sources of food insecurity risk related to climate variables. The history of food insecurity and famine in Ethiopia shows that the worst famines, such as those in 1984, were triggered by drought. The food insecurity and famine incidences have been exacerbated by institutional and political factors. Recoverability from institutional factors is very difficult, and often impossible. As indicated in earlier chapters, severe famines in Ethiopia, orchestrated by political and institutional sources of food insecurity risk were among the major factors that claimed the power of the two past successive governments. The current government is therefore making relentless efforts to prevent critical food crisis pinch points that may cause excessive loss of human life and lead to the loss of state power (Lautze & Maxwell, 2007).

6.2.3. Risk management

Based on their experience, accumulated through exposure to food insecurity shocks, responses to these shocks by government, and non-government actors and their access to resources, family farmers develop different risk management strategies. They do this by taking lessons from all sorts of actors and institutional arrangements that have been in place in response to food insecurity shocks and the results of these arrangements. I examined the risk management strategies of the family farmers based on a series of in-depth interviews, focus group discussions, and results of the household survey. These coping and adaptation strategies can be divided into three: i) Risk mitigation/preventive measures used to divert the consequences of some sources of risk, ii) short-term coping strategies, and iii) long-term adaptation strategies.

[15] Recoverability: 1=Not recoverable, 2= Difficult to recover, 3=Average, 4= Recoverable, 5=Highly recoverable

Risk mitigation/preventive measures

One of the risk mitigation mechanisms developed and used by the family farmers in the study areas is a strategy against *tef* head smut. One of the traditional preventive measures against the head smut disease was smoking the *tef* field when foggy weather occurs, in order to kill the disease-causing organisms. However, this does not work well and the disease has occurred every year for the last 12 years, causing almost total yield loss in Kersa and Omonada. *Tef* is usually planted in the middle of the main rainy season. Farmers tried early planting within the main rainy season but this could not be successful since dews can happen any time and cause head smut to their *tef* crop. Through several trials at different locations, farmers came up with the idea to plant *tef* using the short rainy season (*geniso*) in March and April, and then harvest in June. A local variety of red *tef*, known as *saye*, is used for *geniso*. Saye matures in 60 days and can be considered an emergency crop. This is the result of farmers' trials and is being widely used in Jimma area. This risk mitigation strategy was developed as a result of over a decade of problems with *tef* head smut. It should be note, though, that this is not a simple scaling up of the experience of farmers in other areas but is based rather on the local contexts developed as one of the risk management mechanisms.

Being unavoidable source of risk, with high level of impact on family farmers' food security, livestock diseases are the focus of household and government interventions to reduce these risks. In this regard, farmers use different vaccines in order to protect their livestock from different diseases. The provision of these vaccines is becoming a more common practice with the expansion of livestock health posts and the assignment of at least one veterinary technician at each health post, built in rural areas to serve two *kebeles*. Similarly, farmers use preventive measures against post-harvest crop pests. They use different local practices and chemicals against storage pests such as weevils and rodents. Since there is a very high likelihood of occurrence of storage pests, farmers apply these chemicals to prevent the pests from the very beginning.

Due to a shortage of land, crop production on land with steep slopes is becoming a common practice. As a result, farmers lose a significant amount of top soil every year because of run-offs following intensive rains. They currently use recommended tillage practices, such as tillage against the slope and diverting run-off from their fields as mitigation measures against risk of losing topsoil from their plots.

Short-term coping strategies

Short-term coping strategies are the immediate responses of family farmers to different sources of risk. In a bid to cope with the impacts of food insecurity risk, family farmers in the study areas use a wide range of strategies, ranging from borrowing money or grain and eating less, to selling their assets, including the house in which they are living, and migrating to places where they can gain employment or food. Borrowing money and/or grain from relatives and friends is one of the more common coping strategies. Those households that have relatives and friends in and out of their village try to borrow money or grain, in order to help their family through to the next harvest season. They also borrow money and inputs such as seed, if they have dependable relatives and friends. There are also informal lenders that provide grain, seed, or money, but they offer this service at very high interest rate. Since access to formal credit has several challenges, farmers borrow from such lenders in order to meet their immediate needs. When resources are a constraint, households also resort to buying crop varieties at relatively cheaper prices or use their own saved seeds.

The first measure taken in response to food shortage is saving the available food stock by eating less. In the meantime, households try to diversify their livelihood strategies. These alternative sources of income-earning strategies include farm and non-farm wage labor, livestock income, and transfer incomes such as remittances, food aid, and gifts. Household members try to get wage labor either on neighboring farmers' fields or in the nearby urban centers to generate income for food. Selling livestock, livestock products, and services is the other alternative source of income, while selling firewood/charcoal in the nearby urban centers is a common coping strategy in the study areas. For example, family farmers in Cheka dimtu *kebele*, Bako-Tibe woreda, sell fuelwood and charcoal sourced from Mount Abamargo during stress times. Residents of Cheka dimtu *kebele* describe this mountain as "Abba Hiyeensa" in the Oromiffa language (Father of the Poor), since income from selling fuelwood and charcoal collected from this mountain was the main resource that enabled the community to survive the 1984 famine (Intr. code no. 69, 2015). Those households that have family members/relatives abroad or somewhere in the country try to get remittances, in order to embellish what funds they have available for food. Seeking community support and food aid is also a common coping strategy in response to food shortages. For example,

when the resettlers in Bulbul *kebele* faced a severe food shortage in 2008, civil servants in the *woreda* contributed part of their salary to buy food for the victims until they received food aid from the government. Taking Zeka (tithes in the Muslim religion) is also a self-help strategy among the Muslim community in Jimma area. Everybody is obliged to provide zeka to their needy neighbor, and this helps to support the disabled, elderly, and those who cannot get their daily subsistence.

When the food shortage becomes severe, households sell general household goods and parts of their houses. For example, a resettled family farmer in Bulbul *kebele* (Intr. Code no. 44, 2015) explained "I sold seven heads of cattle that I brought from my original place and finally sold part of the residence house we are living in, just to feed my family."

Migration to areas where people can gain access to wage labor or support, to meet their daily subsistence, is another coping strategy. For example, a resettled farmer in Kitimbile *kebele* (Intr. Code no. 43, 2015), who was severely affected by the food insecurity and hunger that affected resettled farmers in 2008, rented out his land and migrated to a neighboring *woreda* to work for the electricity corporation as a temporary security guard.

Some households stay with relatives for a short period of time, in order to gain access to food until they are able to either produce their own or find other options to buy food or receive food aid. For example, the children and wife of the farmer in the last example were moved to his wife's parents home, until he could earn enough money to buy food for them.

Short-term coping strategies help households survive in prevailing food insecurity situations. However, the success of these coping strategies varies depending on their implications for the future life of the household after the current problem is over. Some coping strategies such as renting out farmland may damage the basis of family farmers' livelihoods and put the farmer in a vicious cycle of poverty. Other coping strategies such as selling charcoal/fuelwood may damage the vegetation cover of the area and expose croplands to erosion, again challenging the future welfare of the household and the community. Thus, putting new institutions in place, in order to protect the livelihoods of individual households and the community, needs to consider the local context and what alternative strategies the farmer can make use of, based on what has been used widely in the past.

Long-term adaptation strategies

According to the Intergovernmental Panel on Climate Change (Field & IPCC, 2012), adaptation to risk refers to an adjustment to the actual or expected effects of the different sources of risk, in order to reduce harm. Long-term adaptation strategies in this study refer to those adopted by family farming households in order to reduce harm from anticipated risk. Since community practices evolve based on the past experiences of the community, long-term adaptation strategies are usually the results of the evolution of the actors and institutions in this setting.

Discussions with family farmers in the study areas revealed a variety of long-term adaptation strategies. Farmers usually select maize varieties with better yield potential (e.g. BH 660), in order to increase their productivity. High-yielding maize varieties normally need long growing seasons and should be planted earlier, in order to minimize the damage cause by the probable early cessation of rainfall (terminal moisture stress). However, the late onset of rainfall is becoming a common phenomenon delaying planting dates, which in turn shortens the number of days before rainfall terminates. This then runs counter to the long season required to grow high-yielding maize varieties. As a result, farmers tend to shift towards early maturing maize varieties that need shorter growth periods, such as BH 543.

Another long-term adaptation strategy of family farmers in the study areas is to diversify the crops they are cultivating. The usual practice is a maize mono-cropping system in which farmers rely mainly on maize for household food and income. However, they tend to diversify their crop to pepper, haricot bean, soya bean, chat, and coffee as ways of distributing risk over different crop enterprises. The tendency for diversification is mainly the result of risks relating to crop input and output prices that family farmers have faced for over the last four decades.

Family farmers in the study areas did not have the tradition to harvest and then store livestock feed for dry seasons. This frequently caused livestock losses during past droughts. However, due to experience and training provided by the agricultural extension, family farmers started harvesting and storing maize stover and *tef* straw for feed after the 1984 famine.

Since 2006, the Ethiopian government has initiated nationwide watershed development campaigns in the form of sustainable land use programs to reduce soil erosion from agricultural

lands. Community-based soil conservation practices such as the construction of soil bunds, tree planting, and the protection of trees on communal lands are mandatory practices that farmers have been carrying out as part of these campaigns. The farmers receive training, technical support, and logistical support to accomplish the soil and water conservation activities. Unlike in the drought-prone areas of the country, where the community receives food or money in the form of a safety net for their involvement in soil conservation activities, farmers in the study areas provide free/unpaid labor services for one month a year. However, some special activities such as gully rehabilitation are done with small payments for the people engaged in such activities. The community intends to benefit from these activities through environmental protection, which may protect their croplands from run-off and erosion.

6.3. Discussion and conclusions

The major sources of food insecurity risk to family farmers in the study areas were discussed through three major categories: Risk related to climate variables, risk related to crop and livestock diseases, and institution-related sources. The major climate-related sources of food insecurity risk were the late onset and/or early termination of rainfall, extended drought, hail and windstorms and a combination of these variables. These variables inflict household food insecurity through their effects on crop production and the scarcity of livestock feed and water. Many crop and livestock diseases are also the results of changes in climate variables (Gadgil et al., 1999), causing different levels of crop failure and the deaths of livestock. There were times (for example, in 1998) when farmers in Amerti Gibe of the Bako-Tibe *woreda* lost all their oxen due to drought and disease outbreaks and failed to cultivate their crop lands (FGD code no. 14, 2015).

In addition to the bio-physical factors, family farmers in the study areas have faced different institution-related risks that have exacerbated the prevailing food insecurity risk. For instance, the pricing policies of the *Dergue* military government (1974-1991), which included nationally fixed grain prices, forced quota-based grain supplies to the Agricultural Marketing Corporation (AMC), and restrictions on grain movement from one region of the country to the other, contributed to famine and food insecurity problems. As a result, one of the worst humanitarian disasters in history happened in 1984 in Ethiopia in general and the study areas in particular. Following on from the downfall of the military government in 1991, different policy

measures were implemented in the input and output markets of the country with the motive of reducing food insecurity risk. However, these policy measures were largely path-dependent and implemented at a cost to family farming households. Consequently, family farmers continued to face food insecurity risk.

Family farming households in the study areas use different risk mitigation measures and long-term adaptation strategies against different sources of food insecurity risk. Use of these strategies depends, among others, on the level of knowledge and experience of the farmers regarding the uncertainty and predictability of the anticipated risk, the availability of inputs for implementing adaptation measures, and the financial and technical capability of the farmers. For example, using early-maturing maize varieties was identified and used as an adaptation strategy against the impacts of the late onset and early cessation of rainfall. The important inputs for this adaptation strategy are improved early-maturing varieties, though they yield less than longer-growing varieties. Therefore, farmers use them only when weather conditions do not allow using other (high yielding) seed strains. In principle, because of the low predictability of rainfall, farmers need timely access to seeds of early-maturing varieties. However, the current seed production and distribution system, which is coordinated mainly by the public extension system, requires family farmers to place an order for these seeds (type of variety and quantity needed) far ahead of time, and they are not allowed to change their order once the demand assessment has been made. This highlights two important issues. To be on the safest side, either a farmer has to order high-yielding as well as early-maturing varieties at the same time, or the seed system needs to produce these very important seeds as contingencies for risk. Due to cost issues, most family farmers cannot afford to buy reserve seeds for contingency purposes. A feasible option could therefore involve working on the flexibility of the seed system and making it retain contingency/emergency seeds in case of climate variability. However, this in turn needs putting in place a sound planning system that considers the potential shortfalls that might happen as a result of risk, due to changes in the climate variables and other source of risk.

On the other hand, family farmers perceived institution-related risks such as dramatic changes in input, output, and food prices as sources of predictable food insecurity risks with very high likelihoods of occurrence. These sources of food insecurity risk are perceived to have a high impact on food security, a low level of recoverability, and are unavoidable. The perceptions of

family farmers about these sources of risk are also related to adaptation strategies against the different sources of food insecurity risk. For example, largely increasing input prices have a strong negative effect on the use of early-maturing varieties as an adaptation strategy against the late onset and early cessation of rainfall. The low-yielding nature of early-maturing varieties might be a future challenge to family farmers looking to use such low-yielding varieties with very high fertilizer and seed costs while the grain price is depressed through different interventions to stabilize grain markets (Kuma, 2002). This shows the interdependence between the different sources of food insecurity risk and how they re-enforce each other. While some of the sources of risk (e.g. changes in climate variables) happen to be initial sources of food insecurity risks, institution-related sources re-enforce the problem by impeding the adaptation strategies of family farmers. This implies the fact that overcoming risks of food insecurity among family farmers needs not only focusing on certain sources of risk, but also having a broader understanding of the contexts.

Results of the household survey among family farms in the study areas reveal that there are significant differences between the two wealth categories (poor and well-endowed) in terms of their risk perceptions, assessments, and management. More proportion of poorly endowed households perceived the high impact of most of the risk sources on household food security. However, these poorly endowed households fell short of using adaptation strategies against the impacts of the different sources of risk. Differences in the perceptions, assessments, and management of risks among farmers in the two wealth categories were the results of two factors. The first was because of knowledge differences between the two groups. Well-endowed households often have a better education and enhanced access to information through their social networks, including state sources (e.g. in the *kebele* administration) and mass media. This enables better-off farmers to gain a deeper understanding and assessment of the different sources of risk and then allows them to act accordingly. The second reason is the difference in the financial and material resources required to apply risk adaptation measures. Well-endowed households have higher budgets to buy, for example, improved seed varieties and to store them for contingencies. This means that the impacts of certain risks exaggerate local inequalities among family farmers. Similar observations were made in the work of Hornidge and Scholtes (2011). Local inequalities among family farmers in terms of the level of impact of the different sources of food insecurity risk reveal the need for a careful understanding of local contexts. Current wealth differences are

the results of different institutional set-ups that have been in place in the area in the past. They could also be the result of introducing new actors and the interaction between different actors and institutions in the past. Designing sound interventions against the different sources of risk for different actors in a given area thus needs careful examination of the evolutionary process that produced the current context in the area in terms of wealth differences and the relatively higher vulnerability of one wealth group compared to others.

7. Land for Food or Power? Risk Governance of Farms and Dams in Southwestern Ethiopia

7.1. Introduction

This chapter analyzes the risk the Gilgel Gibe-I hydroelectricity dam poses to family farming households near to the dam and its reservoir, with the aim of finding a more balanced relationship between land use for energy and food production. I will use the concepts of riskscapes and risk governance to analyze the tensions between these two aspects of land use in southwest Ethiopia. I will also analyze the linkages between risk perception, risk assessment, and risk management for local and non-local actors. Distinction will also be made between the riskscapes of landlessness, food and energy insecurity, and siltation. The chapter will also deal with the potential of spatial planning as a site of risk governance, whereby different actor-related and topical riskscapes can encounter, deliberate upon, and result in policy integration.

7.2. Hydropower generation and its challenges in Ethiopia

In the last two decades, Ethiopia has experienced a massive economic boom coupled with agricultural transition and socio-cultural changes (Stellmacher, 2015). In this context, the country has increased its hydropower generation capacities massively to satisfy domestic consumption demands, boost industrialization, and become a top regional electricity exporter (World Bank, 2007). Most large hydropower dams in Ethiopia have been built in the southwestern part of the country, an area characterized by heavy precipitation in the rainy season, a rugged terrain, fertile soils, and traditional family farming. The production of hydroelectric power demands huge investment in the construction of dams and the creation of artificial lakes, accompanied by massive impacts on land use and land cover. Hydroelectric power projects normally involve the displacement of people, mostly family farmers (Bahiru, 2010; Tefera & Sterk, 2008).

This study focuses on the Gilgel Gibe-I (GG-I) hydroelectricity dam, located in the Jimma Zone, Oromia region, southwestern Ethiopia, which is one of the largest dam projects carried out

in the country in recent decades. The first plans for the construction of a hydroelectricity dam on the Gilgel Gibe river were conceived in the 1960s during the imperial regime, driven by an initial study conducted by the Yugoslav Electro-project company in 1963. Preliminary construction activities at the proposed site started in 1988, followed by a cooperation agreement between the Government of Ethiopia and the Democratic Republic of Korea. The project halted in 1994 but reignited in 1996 following an agreement between the Ethiopian government and the Italian company ENEL (EELPA, 1997; Kassa, 2001). Finally, in 2004, the Gilgel Gibe-I project was commissioned at a total cost of 356 Million USD (World Bank, 2006) (Figure 7.2).

The dam is a 40-meter-high curved, rock-filled wall whose reservoir has a capacity to store 917 million cubic meters of water (World Bank, 1997, 1999, 2007a). Furthermore, the reservoir occupies about 48 square kilometers. The buffer zone, an area found within 500 to 1000 meters from the uppermost limit of the water level in the reservoir in all directions, occupies about 26 square kilometers (World Bank, 1997, 1999). The project passed 184 MW dependable capacity and a total production of 722 GWH/year in 2005 to the Ethiopian grid system (World Bank, 2007), thereby increasing total power supply by 45 percent and making it the nation's largest power plant. Moreover, it enabled the country to reach an additional 380 towns and 164 *woredas*, contributed energy to the country's fast-growing industry and service sectors, and even allowed for energy exports to neighboring countries (Devi et al., 2008).

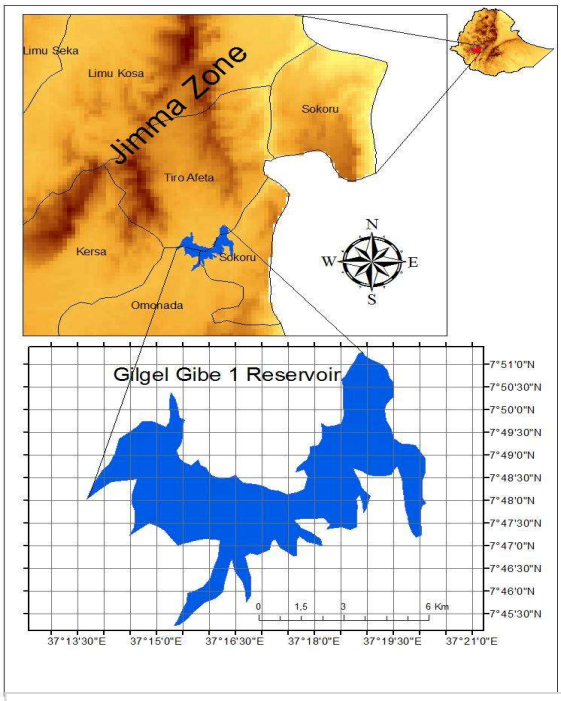


Figure 7.1: Map of Gilgel Gibe-I reservoir

According to the World Bank's project completion report on the Ethiopian GG-I hydropower dam project, the project displaced "only" 706 households, all of which were compensated by the Ethiopian government (World Bank, 2007). The following sections show the

reality is slightly more complicated, and that in the current situation, the effects of the dam on family farming still prevail.

7.3. The riskscapes

The study areas are affected by numerous interconnected and overlapping risk, the resultant outcomes of which affect the service life of the hydropower dam and the livelihoods and food security of the local community. This section presents the different actors in the study area, the important riskscapes for these actors, and their risk management strategies.

7.3.1. Major actors in the GG-I hydropower project area

In this study, we distinguish three sets of actors with respect to the riskscapes of siltation, landlessness, food and energy insecurity with respect to Gilgel Gibe-I (GG-I) hydroelectricity dam. The first set of actors comprises experts including the GG-I project management team, researchers, technicians working for government and nongovernmental organizations, and local and national administration officials. The second set of actors comprises farming households affected by the project. The project affected households can again be classified into those who moved to a resettlement site after being compensated for their properties on their original site, and those whose farming and grazing lands are partially or wholly delineated to the dam project but left in the areas surrounding the project without being compensated. For reasons of simplicity, the first set of actors will be called ‘experts’ and the second set of actors the ‘local community’.

The general scenario is that experts consider the local community as sources of risk of siltation to the hydropower dam while the local community considers GG-I hydropower project as source of risk for landlessness, food and energy insecurity. While the risk of siltation, landlessness, food and energy insecurity are overlapping and inter-related, the different actors perceive them mainly from their own perspectives. Since severe soil erosion arising from intensively cultivated croplands and over-grazed fields causes a high rate of sheet erosion, experts perceive the risk of siltation mainly as the result of the community’s actions, thus forming a riskscape of siltation. On the other hand, because in many cases the GG-I hydro-electricity dam project has led to the

eviction of many of them from their crop and grazing land, without receiving compensation, the local community perceives risks of landlessness, food and energy insecurity as the results of the project and form riskscapes of landlessness, food and energy insecurity respectively.

The practices of different actors shape the nature of the different risks and their effect on other actors in a given space. For instance, the displacement of households from the GG-I hydropower project area, without compensation caused risk of landlessness, food and energy insecurity for the local community. In the same way, the survival strategies of the local community have caused intensive agricultural and natural resource use practices, which have resulted in the rapid siltation of the reservoir. The resultant effect of all of these interconnected practices is the risk of food insecurity to the project-affected households. In the meantime, hydropower generation for the nation has a significant risk of collapse, which would also have a knock-on effect on household food security. It is noteworthy that these riskscapes are associated with the images of certain actors, of their preferred institutions and forms of knowledge.

7.3.2. The riskscape of siltation

The GG-I hydropower dam was designed to serve for at least 70 years. However, Devi et al. (2008) estimated that, considering the rate of siltation when they made their investigations, the volume of the dam would be reduced by half within 12 years and be completely filled with sediment within 24 years. Crop farms, grazing fields, and fragile lands located in the surrounding areas of the reservoir (its immediate catchment) contribute about 99 percent of the sediments that are estimated to be deposited annually. According to Devi et al. (2008), the underlying causes of this sheet erosion are traditional agricultural practices, overgrazing, and the poor management or nonexistence of a buffer zone to protect the reservoir.

The GG-I hydroelectricity dam reservoir is surrounded by communities made up of family farming households, whose livelihoods are based on a mixed crop-livestock model. The buffer zone around the reservoir was intended to be covered with trees of different species and grasses, to serve as a filter in order to protect from siltation. According to the project implementation reports, about 775,000 trees of various species were planted in erosion-prone areas in the buffer zone during the construction phase of the project (EEPCO, 2011). However, these trees covered

only small spots across the vast area of the buffer zone, and the land was not protected or managed as per initial plans (Devi et al., 2008). According to discussions held with the project management team at the Deneba office, aligned with my observations in the field, the buffer zone currently is being used for livestock grazing and crop cultivation right up to water's edge (Figure 7.3). Some of the households that were previously resettled are now coming back to cultivate crops in the buffer zone (Teklu & Kassa, 2011). In a nutshell, failure to enforce the buffer zone plans has led to unsustainable land use and soil erosion around the reservoir.

Source: Taken from proceedings of the workshop on IWM of Omo-Gibe basin (2010) (left) own (right)

Figure 7.2: Cultivation in the GG-I dam buffer zone, up to the water's edge

The risk of siltation to the GG-I dam affects the cascade hydropower plant to GG-I, namely Gilgel Gibe-II, the latter of which relies on water held in the former. Furthermore, the fate of the two power generation plants is tied up with the service life of the GG-I dam, which we know is being threatened by the fast siltation process. For many years, this was the riskscape dominant with international organizations and certainly for national-level administrative and academic/technical actors. In recent years, a good deal of attention has been devoted to the riskscapes of local communities (see section 7.3.5. below).

7.3.3. The riskscapes of landlessness and food insecurity

The dam and reservoir construction project entailed the partial or complete displacement of family farmers residing in 18 *kebeles* in four neighboring *woreda*s (Kersa, Omo Nada, Sokoru and Tiro Afeta) in the Jimma Zone (EELPA (Ethiopia Electric Light and Power Authority), 1997; Kassa, 2001). This area was covered with riparian forest, human settlements, agricultural land, and grazing pasture (World Bank, 2007a). According to the resettlement implementation plan developed by the Ethiopian Electric Light and Power Authority (EELPA), the project affected 2,476 households, of which 706 were residing and farming in the reservoir area and the buffer zone. The remaining households resided outside the project area but nevertheless used it for farming and grazing (EELPA, 1997; Kassa, 2001). The 706 households that were living and farming in the project area were offered the opportunity to receive 2.5 hectares of land, a house with a roof of corrugated iron sheet, agricultural inputs for one year, and the cultivation of the crop land by the project—if they moved to the resettlement site (Kassa, 2001; World Bank, 2007a). These households would also be compensated for their trees and perennial crops, before moving. Out of these 706 households, 562 accepted the offer and moved to the resettlement sites, while 144 preferred to move to nearby relatives around the project area, without receiving replacement compensation for their land. The rest of the affected households (1,770 households) still exist around the buffer zone and have not received any replacement or compensation for the land or immobile properties such as trees and perennial crops lost due to the project. These households were not resettled and they continued to live in the project area because the main criteria for moving were the locations of their residence and farming and grazing land in the reservoir area and buffer zone (Intr. code no. 88, 2016). Those households whose plots were in the reservoir area and buffer zone but residing outside of the buffer zone were not eligible for relocation (FGD. code no. 16, 2016).

According to information obtained from the local administration, compensation for perennial crops grown on private holdings taken up by dam project, houses, and other permanent structures built on these lands was paid only to those who were residing on the reservoir site and in the buffer zone and were therefore forced to move (Intr. code no. 97, 2016). This means that all other farmers who were not in this situation did not receive any compensation, regardless of the size of the holding they lost to the project. Moreover, some of them lost almost all their crop and pasture lands and are now left with just their residences and attached gardens. For instance, one of

the female farmers (Intr. code no. 111, 2016) indicated that all her crop and grazing lands were located in the buffer zone but are now formally inaccessible for her. She told me that she did not qualify for the resettlement, since her house is located outside the reservoir and the buffer zone. Although she has five sons who are already married, there is no intergenerational transfer of land to these young farmers. According to the discussions held with members of the Burka Asendabo *kebele* administration (Intr. code no. 97, 2016), out of a total of about 1,000 households in their *kebele*, about 300 lost their land without being compensated.

According to my interviews with project-affected family farmers, many are still expecting to be resettled, since they perceive that the land use regulations are increasingly seriously enforced. Moreover, as indicated in earlier chapters, family farmers in the study area rank involuntary resettlement and eviction from farmland as the highest risk to food insecurity. In total, about 80 percent of the households in the area reported too little land to produce enough food for their households, while 55 percent perceived themselves as being food insecure.

While discussing the sources of food insecurity risk during the in-depth individual interviews with farmers in Burka Asendabo *Kebele*, one of them reiterated that the "shrinkage of our grazing land area, because of the GG-I dam reservoir, has forced us to limit the number of our livestock. Because of this, we cannot gain access to livestock products such as milk. We [men] can eat meat or visit restaurants and consume milk at least once every two weeks when we go to the town. However, our women and children rarely get even and milk and milk products" (Intr. code no. 48, 2016). Other farmers in this village also indicated during the focus group discussion that family farming communities had lost their communal grazing land due to the project (FGD. code no. 10, 2015).

Apart from the resettlement and the loss of land, family farmers in the study areas attributed the recurrence of the *tef* head smut disease to the humidity of the artificial lake, as there was a marked increase in cases after the dam reservoir was filled with water. They emphasized that *tef* production has been severely affected every year because of the disease, and since it is one of the staple food crops in the area, 98 percent considered it a major threat to their food security. These findings were supported in the focus group discussions (FGD. codes no. 10&11, 2015). Agricultural experts working in the area also witnessed the association of the recurrent occurrence of head smut disease with increased humidity due to the artificial lake (Intr. code no. 35, 2015).

7.3.4. The riskscape of energy insecurity

Electricity provision to local households was promised after construction of the dam, and yet over the last 13 years, none of the project-affected communities in 18 *kebeles* has had access to electricity. This is highly unfortunate, because it could have played a significant and positive role in creating a sense of ownership and given local people a good impression of the project. Moreover, it could have also played an important role in reducing deforestation in the areas surrounding the buffer zone and hence soil erosion and siltation.

In order to avoid early eutrophication, all trees and bushes grown on the reservoir site had to be cleared before it was filled with water. As a result, in addition to the loss of crop lands and grazing pasture, the project affected family farming communities through the loss of access to over 300 hectares of riparian forest that was their major source of fuel (World Bank, 2007). The forest was also the main source of timber for construction and farm implements, as well as a source of many family-farming households' incomes through the sale of wood collected from these forests and sold in nearby urban centers; consequently, this also indirectly affected the energy security of nearby urban dwellers fuel shortages and increasing prices. Following the loss of access to the riparian forest, the affected family-farming communities switched to using small tree stands around residential areas and farmland, and as a result, this resource was depleted within a very short period. One of the interviewed farmers in Burka Asendabo *kebele*, Omonada *woreda*, said: "The forest along the Gibe river used to be our major source of wood for construction and fuel. However, the project cleared it and we had to use the trees in our area. Now we have finished all the trees and we are left with bare land. This has exposed us to run-off and shortage of fuel wood" (Intr. code no. 49, 2015).

7.3.5. Management responses to the siltation riskscape

The actors associated with the siltation riskscape were the ones that had most direct access to state resources of enforcement and to the creation of new institutions: new policies, plans, laws to deal with 'the' problem, for them, siltation. Sometimes, the other riskscapes are acknowledged, yet seen as derivative and secondary; one needs to do some other things to deal with the real thing.

The dam project management team works in coordination with local authorities to exclude farmers from the buffer zone, which they achieve through the local police force and by destroying crops to discourage farmers (Intr. code no. 95, 2016). According to the discussions with the *woreda* and zonal offices responsible for land management, they have also tried to resolve the issue by barring the farmers physically from entering the buffer zone (Intr. code no. 88, 2016). *Kebele* leaders are in charge of enforcing these policies, but as per the discussions I had with them, it is difficult to enforce these policies, as using the buffer zone is a matter of survival for the local community (Intr. code no. 97, 2016). So far, despite huge pressure from the government, in practice, *kebele* representatives said that they could not strictly prevent farmers from accessing the land in the buffer zone. In this context, one has to consider that many members of the *kebele* administration and their relatives are affected by the GG-I project and might have lost their own land. Alternative riskscapes thus come into play through different identifications.

For several international actors, the siltation riskscape asked for management responses broader than the siltation issue itself: integrated watershed management, a form of supra- local governance which gives central place to both land and water management. From the very outset, the GG-I project feasibility study (World Bank, 2007) indicated that the reservoir had a high potential for rapid siltation and underlined the need for integrated watershed management. In 2010, a task force, set up to reduce the siltation problem, was established and included a variety of non-local stakeholders. The task force worked on coordinating efforts to reduce the siltation rate and was operational at the time fieldwork for this study was conducted.

At the national level, based on expert recommendations, the government of Ethiopia (Ministry of Agriculture) has initiated national watershed management schemes under the Sustainable Land Management (SLM) program, focusing on soil and water conservation practices being implemented through community mobilization. In this context, the GG-I watershed has been given due emphasis. In addition to the SLM program, the Federal Ministry of Water, Irrigation and Electricity has allocated additional resources to overcome different forms of soil erosion, gullies, and landslides (Figure 7.3).

Source: Picture taken during the fieldwork

Figure 7. 3: Gully rehabilitation work (left) and rehabilitated gully (right) around the buffer zone

As part of wider integrated watershed management activities, a community development and knowledge management project for the Satoyama[16] Initiative (COMDESKS) has also been running at the Gilgel Gibe-I catchment since 2012. The major purpose of the project is to support the activities of community-based organizations in areas of soil conservation activities and crop diversification, as well as eco-friendly and small-scale community enterprises such as apiculture, cattle fattening using the cut and carry system, and fisheries, all in order to diversify household income and relieve pressure on the fragile land. Economic and community development issues are thus seen as secondary to the central siltation issue. The 'community base' is also tenuous, as COMDESKS activities do not focus on households whose livelihoods depend on the buffer zone. The siltation riskscape and its actors remain entrenched. Meanwhile, farmers living around the buffer zone still use grazing land to fatten cattle, since there is no functional monitoring and enforcement mechanism on the ground.

[16] The Santoyama Initiative is a global undertaking to promote the sustainable use and management of natural resources in socio-ecological production landscapes, with the aim of maintaining, rebuilding, and revitalizing them accordingly.

7.3.6. Management responses to riskscapes of the local communities

Due to the relative powerlessness of the locals, and their relative weak access to rule-making, responses are often individual and informal. In sofar as one can speak of parallel local governance, with more attention given to other riskscapes, it is of the informal and risky character already mentioned: ignoring higher level imperatives by local government leaders, and coordinating with neighbors and those *kebele* leaders to establish local informal rules which minimize conflict around the use of lands in the buffer zone. One other response is that of households that can afford to access land outside the buffer zone through renting in and sharecropping arrangements (Intr. code no. 97, 2016).

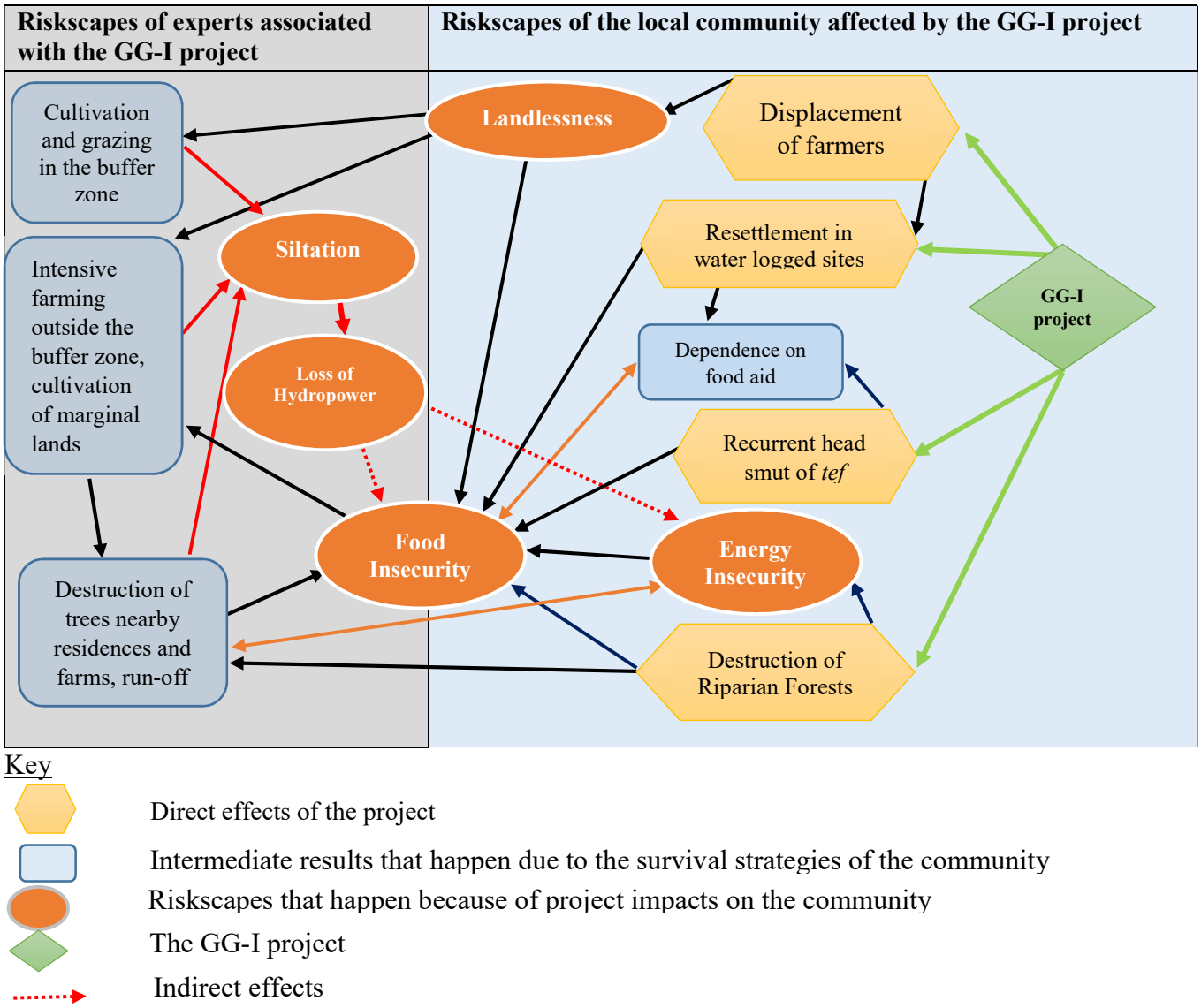
In order to deal with the *tef* head smut disease, farmers have come up with adaptation mechanisms of their own. This involves shifting the planting time and using an early maturing local variety of *tef* known as *saye*. Farmers call this practice *geniso*. They use short rains before the onset of the main rainy season and produce *tef* over a two-month period (Intr. code no. 85, 2016), in order to escape from the high humidity when *tef* reaches maturity. The problem with *geniso* is that farmers cannot produce it on large plots of land.

To deal with the risk of energy insecurity, farmers rely increasingly on vegetation in the areas surrounding their homesteads and farmland. Additionally, they also tend to plant more eucalyptus, due to its fast growth rate, to be used for fuel wood and house building; however, the law forbids planting eucalyptus trees on and around farmland. Using crop residues, especially maize and sorghum stover, as fuel is another mechanism that farmers use to overcome their energy insecurity.

7.4. Discussion & conclusions

The dependencies among the different sources of risk show that one risk is the result of another, which in turn creates a locked loop cycle. The riskscapes and interdependencies are shown in the following illustration (Figure 7.4). If the different actors follow only their own perspectives and continue to promote interventions targeting their own riskscapes, it might lead to a lose-lose situation with a substantial reduction in the nation's power supply as well as continuous or even aggravated food insecurity in the GG-I project area. An actor's responses to riskscapes thus affect

other riskscapes, for other actors and for the actor itself; in this case, all responses tend to aggravate all other riskscapes.



Source: Own sketch

Figure 7.4: Riskscapes of landlessness, food and energy insecurity, and siltation

The existing practices of different actors on the ground also highlights that they perceive only certain sources of risk, depending on their personal or organizational goals and responsibilities vested in them; for example, experts associated with protecting the GG-I dam focus mainly on immediate causes. The risk management strategies of state actors also target resolving

these immediate causes, without trying to address their underlying causes. However, the survival strategies of the project-affected communities have led to the increased siltation of the reservoir.

For the project-affected communities, landlessness is the major source of food insecurity risk, and losing land has become a very real risk, because of the dam experience and scarce economic alternatives. In order to mitigate food insecurity, many people who lost their land in the buffer zone and reservoir area have had no choice but to cultivate crops in the buffer zone, which is prohibited. Those who have been displaced from their lands and left with some plots outside the project area have also intensified their farming operations on remaining plots of land. Some of the farmers cultivate marginal lands while others try to access land through sharecropping and land rental arrangements. In order to gain the maximum benefits from this sparse availability of land, these farmers have had to intensify their farming practices. The study conducted by Devi et al. (2008) indicated high levels of nutrients in the reservoir's water, caused by the excessive use of chemical fertilizers as a result of intensive farming practices in the watershed.

Similarly, the destruction of riparian forest in the project area triggered responses that have created new risks. It increased the pressure on vegetation around farms and residences, which in turn has increased run-off and the risk of siltation as well as household food insecurity. In a nutshell, the risk of landlessness, food and energy insecurity, and siltation are interconnected and interdependent, one causing the other. The actors, however, do often not understand this, and there are no tools (institutions) at hand, nor arena's (a structured meeting for actors) where this can be brought to light.

A piecemeal risk approach, as in the case of the GG-I project, would be like treating the symptoms of a disease, so what is really needed is a holistic approach to understand the broader perspective and the interconnected nature of the different sources of risk, and considering the whole set of interconnected sources of risk. In theoretical terms, this is an argument for a systems perspective, and in our case, such systems perspective is underpinning the risk governance ideas in -Luhmannian social systems theory (1995).

In practical terms, what is needed is risk governance (distinct from entirely privatized risk management and distinct from top down state management), and in this case, likely a more participatory form of governance as such. Within practical risk governance, the concepts of riskscape and risk governance can be of use, opening up the discussion about differences in

riskscapes and about the connections between risk perception, assessment and management per riskscape. We mentioned earlier that opening up the diverse black boxes of risk perception, assessment and management through conversation and confrontation in governance can enable a reassessment of their connections, and for a re- interpretation of the situation and its required interventions.

The case indicates that for clearly spatially situated risk, also most susceptible to a riskscape approach, spatial planning, or land use planning, might be an appropriate site and form of risk governance (Van Assche & Djanibekov, 2012). This seems the case because many things take place in place, and coordination of spatial organization can be a privileged site of policy deliberation and integration. It can be an appropriate place for riskscapes to encounter, to be analyzed, in their difference and internal linkages. For the Ethiopian case, a form of participatory land use planning might work to find a workable approach for the buffer lands around the dam, and for the lands farther away which became overused in the feedback loops after the dam displacements. These lands could therefore be subjected to a specialized, transitional form of governance, with more detailed land use regulations, more intense forms of deliberation and participation, and higher levels of policy integration (Van Assche et al, 2017b). The transition could last as long as the risk are perceived big enough to warrant the institutional exception.

An evolutionary perspective on risk governance, however, would warn that such planning-focused form of risk governance would be unlikely to work if it ignores the context it lands in, and the historical dependencies marking that context (Beunen, Van Assche, & Duineveld, 2015; Van Assche & Hornidge, 2015; Valentinov, 2014). For the Ethiopian case, this would entail a careful interrogation of existing forms of spatial planning: Do they work? For whom? What are the most trusted tools (institutions)? What is the balance between participation and representation? Is the guidance for planning best coming from a formal land use plan or through other formal and informal institutions? These questions have to be addressed before choosing an institutional form of risk governance.

For a general theory of risk governance, the Ethiopian dam story contains several valuable pointers.

- First of all: Risk management in a complex multi-stakeholder context needs to be risk governance, with the double implication of being embedded in broader governance and

containing an internal diversity of actors, institutions, and forms of knowledge, leading to collectively binding decisions.

- Under special conditions of grave risk and entangled forms of risk, one can consider giving risk governance a prominent place in governance, and even shaping local governance around risk. Spatial planning can be a form and site for such transitional governance.

- Risk governance can be structured around the encounter, analysis and deliberation of riskscapes associated with different actors, their roles, their preferred institutional tools, and forms of knowledge and narratives.

- The assessment of riskscapes and the search for common ground and risk mitigation strategies will be helped by an understanding of the internal complexity of riskscapes, especially the linkage between risk perceptions, assessment, and (envisioned) management responses.

- In risk governance, the choice of solutions has to be inspired further by a deep understanding of broader governance evolutions, where every proposed new institution, new form of knowledge, new actor, or relation between them needs to be grounded in the existing configuration of actors, institutions, and power/knowledge.

8. Risk Perceptions and their Role in the Choice of Multiple Livelihood Strategies in Southwest Ethiopia

8.1. Introduction

Farmers' perceptions of risk are basically the result of their exposure to different types of shocks and experiences with governance of these shocks (Barrett et al., 2000; Doss et al., 2008). Because people behave according to their personal perception of risk, I believe that farmers' perceptions of the different sources of food insecurity risk in turn influence their decisions to choose different livelihood strategies. These strategies could also be considered as their responses to perceived risk. Livelihood strategies represent a portfolio of activities and choices that people make to achieve their livelihood goals, including productive activities, investment strategies, reproductive choices, etc. (Jansen, Pender, Damon, Wielemaker, & Schipper, 2006; Adato & Meinzen-Dick, 2002; Norton & Foster, 2001a; Ellis, 1998). Several studies have analyzed the role of diversifying livelihoods in protecting households against food insecurity shocks (Barrett, Bezuneh, & Aboud, 2000; Barrett & Reardon, 2000; Block & Webb, 2001; Ellis, 1998; Woldenhanna & Oskam, 2001). However, studies on the role of family farmers' risk perception on the choice of alternative combination of different livelihood strategies are very limited. Understanding how risk perceptions influence the choice of different livelihood strategies helps in the design of different plans, policies, and strategies targeting improvements in food security through the promotion of alternative livelihood strategies. The purpose of this study is therefore to provide empirical evidence on the role of shocks and evolving governance on the risk perceptions of family farmers, and to investigate the influence of family farmers' perceptions of different sources of food insecurity risk on the choice of alternative livelihood strategies.

This empirical study contributes to the growing literature on livelihood diversification in the following ways. First, a theoretical framework developed in this study helps grasp how the exposure of family farmers to different biophysical shocks, evolving governance, and socioeconomic circumstances shapes their perceptions, assessment, and management of food insecurity risk. This is a framework revolving around the concepts of evolutionary risk governance and sustainable livelihoods, as well as the implications of the outcomes to household food security. Second, a system method of estimation that jointly determines the decision to choose multiple

types of livelihood strategies, such as crop, livestock, off-farm, and transfer income strategies, is applied. The likely correlations between the choice decisions across the different strategies for the same household are recognized and provide evidence as to whether livelihood strategies are used in a piecemeal way or in combination with other livelihood strategies. Third, empirical evidence on the complementarity of crop income strategy (which is important for farmers) with other livelihood strategies is provided in this study. Fourth, compared to most previous studies on the determinants of household choices, this study has the advantage that it not only looks at whether or not one participates in the choice, but it also analyzes the intensity of choice as measured by the number of livelihood strategies per family farmer. Such knowledge is important, because it can be used to formulate specific policies to enhance combinations of livelihood strategies. To the best of my knowledge, empirical evidence on the heterogeneous effect of farmers' risk perceptions of the intensity of livelihood strategies is scarce, and discussions on the implications of such evidence are virtually non-existent. For this reason, this study aims to fill this gap in the literature. Utilizing very recent data from the smallholder family farming system in Ethiopia, I concentrate on the relative importance of farmers' risk perceptions and various household, farm, and community characteristics on the probability and levels of livelihood strategies. The empirical exercise in this study is based on the potential of evolutionary risk governance framework, and the associated outcomes will help future policy and development actions to improve the livelihoods of family farmers and thereby alleviate the food insecurity problem.

8.2. Empirical models and descriptive statistics

The methodology used in the data collection process was presented in the second chapter of this study. The sampling procedure followed to select the sample households is also described in the second chapter. This section of the current chapter presents the empirical models used in data analysis, and a description of the dependent and explanatory variables.

8.2.1. Empirical model

Because family farmers use a mix of livelihood strategies at the farm household level to deal with a multitude of food insecurity risks, this study applies the joint estimation model on the likelihood

and level of the decision made regarding the choice of livelihood strategies. Ignoring the interrelatedness of livelihood strategies means that decisions on choosing them are made exogenously, an approach that may underestimate or overestimate the influences of various factors on the final choice. In addition, the joint estimation could clarify the reality faced by decision-makers, who are often faced with alternative livelihood strategies that may be used simultaneously as complements or substitutes. This implies that the choice in this regard is inherently multivariate, and attempting univariate modeling would exclude useful economic information about interdependent and simultaneous decisions (Dorfman, 1996; Belderbos et al., 2004). Accordingly, the econometric specification in this paper consists of two parts: In the first part, farmers' choices of livelihood strategies are modeled using a multivariate probit model (MVP), while the second part analyzes the determinants of the combinations employed, using an ordered probit model.

Multivariate probit model

The MVP approach simultaneously models the influence of the set of explanatory variables on each of the different livelihood strategies, while allowing for potential correlations between unobserved disturbances of the different equations, as well as the relationship between the choice of livelihood strategies (Dorfman, 1996; Belderbos et al., 2004). One source of correlation may be because the same unobserved characteristics of farmers could influence the choice of different livelihood strategies. However, the univariate probit/logit models ignore the fact that the decision to choose a particular livelihood strategy may be conditional on the choice of another livelihood strategy due either to complementarities (positive correlation) or substitutability (negative correlation) between different strategies (Khanna, 2001). Failure to capture unobserved factors and interrelationships among choice decisions leads to bias and inefficient estimates (Greene, 2008).

The observed outcome of choice of alternative livelihood strategies can be modeled in a random utility framework. Consider the i^{th} family farmer $(i = 1, \ldots, N)$ who is facing a decision on whether or not to choose alternative livelihood strategies. Let Uo represent the utility obtained from choosing none of the alternative livelihood strategies and U_k represent the utility obtained from the choice of k^{th} livelihood strategy, where k denotes crop income-generating livelihood strategies (C), livestock income-generating livelihood strategies (L), off-farm income-generating

activities (O), and transfer income-generating livelihood strategies (R). The family farming household decides to choose the k^{th} livelihood strategy if the benefit of choosing it is higher than the choice of none of the strategies: $Y_{ik}^{*} = U_k - U_0 > 0$. The net benefit (Y_{ik}^{*}) that the farm household derives from the k^{th} livelihood strategy is a latent variable which is determined by observed household, institutional, and location characteristics, the perceptions of households of certain risks, farmer's behavior in terms of averting certain risks, the unanticipated shocks that the farm household faces (X_i), and unobserved characteristics(ε_i).

$$Y_{ik}^{*} = X_i\beta_i + \mu_i \quad \text{(k= C, L, O, and R)} \tag{1}$$

Using the indicator function, the unobserved preferences in equation (1) translate into the observed binary outcome equation for each choice as follows:

$$Y_k \begin{cases} 1 & if \quad Y_{ik}^{*} > 0 \\ 0 & otherwise \end{cases} \qquad k(C,L,O,R) \tag{2}$$

In the multivariate model, where choosing a number of livelihood strategies at a time is possible, the error terms jointly follow a multivariate normal distribution (MVN) with zero conditional mean and variance normalized to unity (for identification of the parameters), where $\left(\mu_C, \mu_L, \mu_O, \mu_R\right) \approx MVN\,(0, \Omega)$ and the symmetric covariance matrix **Ω** is given by:

$$\begin{bmatrix} 1 & \rho_{CL} & \rho_{CO} & \rho_{CR} \\ \rho_{LC} & 1 & \rho_{LO} & \rho_{LR} \\ \rho_{OC} & \rho_{OL} & 1 & \rho_{OR} \\ \rho_{RC} & \rho_{RL} & \rho_{OR} & 1 \end{bmatrix} \tag{3}$$

where ρ (rho) represents the pairwise correlation coefficient of the error terms corresponding to any two livelihood strategies equations to be estimated in the model. A positive correlation of ρ is interpreted as a complementary relationship, while a negative relationship is interpreted as a substitute. The off-diagonal elements in the covariance matrix are of interest here, since they represent the unobserved correlation between the stochastic components of the different types of

livelihood strategies. This assumption means that equation (2) gives an MVP model that jointly represents decisions to adopt a particular livelihood strategy, which is explained by the hypothesized explanatory variables. This specification with non-zero off-diagonal elements allows for correlation across the error terms of several latent equations, which represent unobserved characteristics that affect the choice of alternative livelihood strategies.

A model of intensity of livelihood strategies

In addition to the pooled multivariate probit model, an ordered probit model is used to analyze the mix of alternative livelihood strategies. This is because, the former model only considers the probability of adopting alternative livelihood strategies and does not identify the intensity of alternatives chosen by individual households, or the intensity of adoption. The ordered probit model analyzes factors that influence the adoption of combination of livelihood strategies, or the number of strategies and individual strategies.

Given the ordered nature of the dependent variable, I therefore adopt the model involving a different latent variable (C*), itself a function of observed heterogeneity (X) with unknown weights (β) and other unobserved characteristics (u). The observed realization of (C*) is denoted by C, such that:

$$C_i = X_i\beta + u_i \qquad (4)$$

defines the categorical outcome variable $C_i \in \{1,\ldots,m\}$, indicating the number of strategies used by farmer i and β is treated as a random coefficient. Estimations of (4) in a linear regression model may lead to biased estimates of the parameter vectors and hence misleading results. In this case, the discrete probability function, conditional on all explanatory variables, is commonly specified as an ordered probit model. The multinomial logit model with its multi-index structure is certainly another option. However, this model does not make any use of ordering information and therefore cannot be efficient (Boes & Winkelmann, 2006).

8.2.2. Descriptive statistics

Dependent variables

The dependent variables in this study are the four major livelihood strategies of family farming households, namely crop production, livestock production, off-farm work and transfer income. Crop production is the major source of livelihood for the family farmers in the study areas. I consider those farmers that cultivate different crops for household consumption or for market as obtaining income from crop production as far as they can cover their variable costs. Accordingly, 95 percent of the family farmers had a crop income in 2015.

Livestock income is derived from the sale of livestock, livestock products, and associated services. Though the foundation stock that reproduces and generates marketable surplus or consumable products and services within a given year could be obtained due to efforts in earlier years prior to the consumption year, I considered income obtained from these animals during the 12-month period running from November 2014 to October 2015. Accordingly, about 77 percent of the sample households had livestock income during the specified time period, and the average size of livestock ownership was 5.2 TLU. Livestock such as cattle, sheep, goats, donkeys, horses, and mules as well as poultry, and honey bees are reared in the study areas.

Off-farm income is generated through different activities outside of own farming operations. This could be farm and non-farm wage income, non-agricultural business activities, part-time salaried employment, and other income streams. The role of off-farm income-generating activities to the family farmers is indeterminate a priori, and they can complement crop and livestock production activities in terms of generating income for the purchase of inputs. Off-farm activities can also protect the food reserves of the family and livestock sales, by generating income that could be spent to meet compulsory household expenditures. On the other hand, participation in off-farm activities competes for household labor that could be used in crop and livestock production and may have a negative impact on the crop and livestock incomes. About 39 percent of the sample households reported that they received off-farm income in 2015.

Transfer income in this study refers to remittances obtained either from abroad or domestically from household members or others, as well as safety net and food aid income and income obtained in the form of marriage gifts. The general argument about transfer incomes is that

they smooth consumption throughout the year (Andersson et al., 2011; Knowles & Anker, 1981; Miller et al., 2011; Sabates-Wheeler & Devereux, 2010). Some studies have indicated that they promote livestock accumulation, income growth, and food security (Sabates-Wheeler & Devereux, 2010), while others (Andersson et al., 2011) have posited the positive impact of transfer incomes on tree holdings but no significant impact on livestock holdings. The general observation I made during the qualitative assessment was that family farming households tend to generate transfer income as one of their livelihood strategies by sending children abroad (Int. code no. 46, 2015) or helping household members find employment in different organizations. In 2015, about 12 percent of the sample households had transfer income, while this figure was eight percent in 2010.

Explanatory variables

I explored a rich body of literature on the choice and impact of livelihood diversification, in order to select a comprehensive set of drivers that are known to affect family farmers' decisions (Hussein & Nelson, 1998; Abdulai & CroleRees, 2001; Block & Webb, 2001; Babulo et al., 2008; Doss et al., 2008; Binder & Schöll, 2009; Andersson et al., 2011; Sulewski & Kłoczko-Gajewska, 2014; Berman, Quinn, & Paavola, 2015). Based on these empirical works and economic theory, I have summarized household and farm characteristics in the empirical specifications. These include perception of the household of different sources of food insecurity risk, the risk preferences of farmers, access to input and output markets, socioeconomic variables including household and farm characteristics such as family size, age of the household head, education of the spouse, the social capital of the household, and household resources and constraints. Table 8.1 provides definitions of the variables used in the analysis and the mean values for the entire sample. Below, I focus on describing these variables.

This study concentrates on the family farmers' risk perceptions of of climate variables such as drought, floods, hailstorms; crop pests and diseases; agricultural inputs, outputs, and food prices; income failure; and robbery of assets. I derived these risk perceptions through three steps questions. In the first step, I asked if the farmer had encountered any shocks from the specified sources of risk in the past 10 years. Then, I asked if the farmer still feels this variable was a source of risk to her/his household food security. I finally used a risk ladder to probe the farmers' risk

perceptions, by asking the following question: “How would you judge the importance of the different sources of risk in affecting your household food security?” The respective sources of risk were then read out one by one. The response options given were as follows: 1=least important, 2=not as such important, 3=average, 4=important, and 5=most import. These were then converted into dummy variables for each source of risk. About 36 percent of the sample farmers perceived drought as an important source of food insecurity risk. Earlier studies (Webb & Von Braun, 1994; Hill & Porter, 2017) also found drought and famine shocks as the major causes of food insecurity in Ethiopia. I expect that households that perceived drought as important source of food insecurity risk will have a low propensity to choose crop income and a higher propensity to choose livestock and other livelihood strategies. Similarly, I expect that farmers that perceived flooding as an important source of food insecurity risk will have a low propensity to choose crop income strategies and a higher propensity to choose livestock and other income strategies.

Crop pests are among the major issues limiting crop productivity and the income obtained from crop production. About 78 percent of the sample farmers perceived crop pests and diseases as important sources of food insecurity risk. I expect that perceptions of crop pests and diseases as important sources of food insecurity risk will have a negative impact on the choice of crop income strategies and a positive impact on the adoption of other livelihood strategies.

Increasing input prices and decreasing output prices are the major challenges to family farming households. Accordingly, 44 percent and 62 percent of the sample farmers perceived high input prices and low maize prices, respectively, as important sources of food insecurity risk. I expect that those farmers that perceived high input prices (mainly due to the increasing prices of chemical fertilizer and certified seeds) will have a low propensity to choose crop production strategies and a high propensity to adopt livestock and other livelihood strategies. According to the in-depth interviews and focus group discussions conducted in the study areas (Int. code no. 66 & 69, 2015; FGD code no. 12 & 14, 2015), all farmers are the victims of ever-increasing high input prices. However, resource-poor farmers that are usually short of cash and are not creditworthy enough to gain access to microfinance credit to buy fertilizer and improved seeds suffer the most from this problem. Such farmers usually get into the sharecropping land tenure arrangements in which they give up at least half of their harvest and eventually seek transfer incomes to gain access to cash/food. On the other hand, I expect that farmers that perceived

decreasing maize prices will have a low propensity to choose a crop production strategy and a larger propensity to adopt livestock, off-farm, and transfer income strategies.

The perceived failure of household income as an important source of food insecurity risk is among those variables that I expect to influence households' choices surrounding different livelihood strategies. I expect farmers that perceived the failure of household income may have a low propensity to choose off-farm income strategies and a high propensity to choose crop and livestock income strategies. As indicated in Table 8.1, about 30 percent of the sample households perceived this factor as an important source of food insecurity risk.

Perceptions of the health and welfare of household members are among those variables expected to influence significantly farmers' choices of livelihood strategies. I expect that farmers that perceived sickness of a household member will have less propensity to choose wage labor-related off-farm income strategies and a high propensity to choose transfer and livestock production strategies. About 30 percent of the sample farmers perceived sickness of household members as an important source of food insecurity risk.

Family farming is often sensitive to changing environmental stresses; however, ex ante risk-easing mechanisms, such as insurance markets, are not well developed in developing countries. One concern is that farmers' choices of livelihood strategies are modified in response to the presence of these uncertain production environments. The nature and degree of this alteration is determined by the magnitude of the decision-maker's preferences toward risk. Hence, I included questions in the survey to elicit farmers' risk preferences. The approach in this regard was set up following Binswanger (1980) and Wik et al.'s (2004) experimental method, which can be conducted as a hypothetical or a real payoff situation and measures attitudes by observing the reactions of farmers to a set of actual gambles (Binswanger, 1980). In this study, respondents were presented with real lotteries (Xmax, Xmin, p), promising a real monetary prize for Xmax with probability p, or Xmin with probability of 1-p. The lotteries represented different farming conditions with six different pay-off levels for a given probability of a bad or a good outcome (such as harvesting). The sample farm households were presented with alternatives 1 to 6. Once the households selected one among the alternatives, they had a 50 percent probability of having bad harvest or good harvest pay-offs. The experimental method consisted of offering farmers a set of alternatives representing different risk aversion classes (extreme, severe, intermediate,

moderate, slight, and neutral) within which higher expected gain could only be obtained at the cost of higher variance, and thus a decline in risk aversion. However, for the simplicity of analysis, instead of the six classes, I used in this study a dummy variable in which the six risk aversion classes were summarized into two major categories. Those farmers whose risk preference lay from slight to extreme risk aversion were categorized as 'risk averse', and the rest as risk-neutral. Accordingly, about 76 percent of the sample farmers were found to be risk-averse and the rest were risk-neutral.

Household characteristics such as family size, sex, age, and level of education of the household heads are usually considered to influence decisions to adopt different livelihood strategies (Abdulai & CroleRees, 2001; Barrett et al., 2001; Block & Webb, 2001; Smith et al., 2001; Woldenhanna & Oskam, 2001). For instance, family size can have implications for the labor supply of the household and the need to satisfy food requirements and other basic necessities. This in turn can influence a household's decision to adopt different livelihood strategies. Accordingly, the average family size in the study areas was seven persons. On the other hand, Block and Webb (2001) reported the importance of the gender of the household head in participating in off-farm income generation activities. I also considered the sex of household heads. In this study, I expect that male-headed households could be engaged in more diversified livelihood strategies than female-headed households. This is possibly because of the labor-intensive nature of some of the alternative livelihood strategies for which female-headed households are usually constrained. About 95 percent of the sample household heads are males. Apart from the sex of the household heads, I also hypothesize that a higher level of education of the household head can influence household's decision to adopt more diverse livelihood strategies. This could be related to the better understanding of technologies by better-educated household heads.

The ways in which individuals relate to wider social networks and the effects of these social capital networks on the choice of livelihood strategy are also considered in this stufy. In Ethiopia, where information is scarce and markets are ill-functioning, social networks and social spillover are considered means to facilitate the exchange of information, enable farmers to access inputs on schedule, and overcome credit constraints and shocks (Barrett, 2001; Fafchamps & Minten, 2002; Isham, 2002; Bandiera & Rasul, 2006; Marenya & Barrett, 2007). Particularly for family farmers, local institutions play a pivotal role in building resilience and reducing the food insecurity risk

(Agrawal et al., 2009). In this study, two social networks and capital variables are distinguished: A household's kinship network, defined as the number of close relatives living in the farmer's village, and a household's connection with local organizations, defined as whether a friend or a relative is in a leadership position in a government or non-government office. Such classification is important, as different forms of social capital and networks may affect the choice of different livelihood strategies in various ways, such as through information sharing, stable market outlets, labor sharing, the relaxing of liquidity constraints, and the mitigation of risk. However, there is also a dark side to social capital, as noted in DiFalco and Bulte (2011), where social capital may reduce incentives for hard work and induce inefficiency such that farmers may exert less effort investing in adaptation.

Among the household resources, I looked into household ownership of livestock in tropical livestock units (TLUs), total farm size, and the total value of household assets. Livestock holding is expected to influence a household's decision to adopt crop and other livelihood strategies in terms of the supply of farm traction power, manure, and cash for purchasing inputs for crop production and generating crop income. Livestock can also compete with crop production in terms of competition for land and with crop and off-farm activities in terms of household labor. As a result, I expect a negative influence of ownership of larger TLU on crop, off-farm, and transfer income strategies. On the other hand, the high value of household and farm assets is expected to influence positively the choice of crop, livestock, and off-farm strategies. Households with larger farm size are also expected to have a greater propensity to adopt crop and livestock activities and less propensity to adopt off-farm and transfer activities.

I considered distance to the main market (in minutes of walking) as the market access proxy variable affecting the choice of different livelihood strategies. Market access variables are associated directly with the transaction costs that a farm household could face in input and output marketing activities, thereby influencing the availability of information, technologies, job opportunities, and support organizations. Sadoulet and de Janvry (1995) defined transaction costs as the embodiment of barriers to market participation by resource-poor smallholders, and they have been used as a definitional characteristic of smallholders and as factors responsible for significant market failures in developing countries. The average walking distance to main markets is about 80 minutes. I expect that the farther the household is from the main market, the more the

likelihood of adopting crop and livestock production as the major livelihood strategies and the less the likelihood of adopting other strategies.

In order to understand whether a farmer has access to a source of cash, I followed Feder et al.'s (1990) approach by constructing a credit access variable. This measure of credit tries to distinguish between farmers who choose not to use available credit and those who do not have access to credit. This idea is often valid on the ground that as many non-borrowers do not borrow because they actually have sufficient liquidity and not because they cannot obtain credit, while some cannot borrow because they are not creditworthy (Feder et al 1990; Doss 2006). In this study, the respondents were asked to respond to two sequential questions, namely whether or not credit is needed and, following a 'yes' response, whether or not credit is obtained for farming operations. The credit-constrained farmers are then defined as those who need credit but are unable to secure it (49 percent of the sample households). I expect an asymmetric effect of credit constraint on the choice of different livelihood strategies, whereby it negatively influences the choice of crop and livestock production and promotes the choice of transfer income and indeterminate a priori off-farm work. In addition, the results of my qualitative assessment in the study areas show that constraints on gaining access to credit for farm operations compels farmers to share crop or rent/lease out their farmland. Accordingly, 55 percent of the sample households reported that they have income from leasing out their farmland. The average income obtained from land lease in 2015 was 2,100 Ethiopian birr per household per year.

Table 8.1: Descriptive statistics of the variables used in the empirical models.

Variable	**Variable description**	**Mean**	**SD**
Risk perceptions (perceived as important source of risk to food security)			
Drought risk	1=if perceived drought as important source of risk	0.36	0.48
Flood risk	1=if perceived flood and too much rainfall	0.43	0.49
Hail storm risk	1=if perceived hailstorm	0.33	0.47
Crop pest risk	1=perceived crop pest and diseases as important source of risk	0.78	0.42
Input price risk	1=if perceived increase in input prices	0.44	0.50
Output (maize) price risk	1=if perceived decreases in maize price	0.62	0.49
Income risk	1=if perceived failure of household income	0.30	0.45
High food price	1=if perceived increases in food price risk	0.44	0.50
Risk of robbery	1=if perceived robbery of assets	0.21	0.41
Sickness of household member	1= if perceived sickness of the household member	0.30	0.45
Risk preferences			
Risk averse	1= if risk averse	0.76	0.43
Household characteristics			
Family size	Family size	7.16	2.45
Sex	1= if household head is male	0.95	0.22
Age	Age of household head in years	45.38	11.69
Education	Years of education of the household head	2.69	3.10
Social Capital			
Friends in leadership position	1= if friends/relatives in leadership position	0.36	0.48
Number of relatives	Number of relatives living in the village	5.14	9.80
Household resources and constraints			
Farm size	Total farm size in ha	1.82	1.86
Asset	Value of farm and household assets in Eth. Birr	46,746.5	74,331.3
Tlu	Livestock ownership in Tropical livestock units	5.24	3.50
Land rent	Income from land lease/rent in Eth. Birr per year	2,124.78	3,683.03
Market distance	walking distance to nearest main market in minutes	79.87	61.35
Credit constraint	1= if credit constraint	0.50	0.50

Source: Own computation from household survey data

8.3. Results

8.3.1. Joint and marginal probabilities of adopting alternative livelihood strategies

The joint and marginal probability distribution of different livelihood strategy choices among the sample households is presented in Table 8.2. Although each farmer in the study areas used at least one of the four (crop, livestock, off-farm and transfer) livelihood strategies, the majority (more than 80 percent) were dependent on more than one option. This reveals the fact that alternative combinations of livelihood strategies are common in the study areas. The most widely practiced livelihood strategy is crop production, both in isolation and in combination with other strategies, and about 15 percent of households choose it as their sole source of income. However, livestock production is commonly observed in combination with other strategies than in isolation. The same is true for the other strategies (i.e. off-farm work and transfer incomes). Only one percent of the households chose livestock, off-farm, or transfer incomes as their sole livelihood strategy. As expected, the highest proportion of the sample households (about 37 percent) are involved in joint crop and livestock production, showing complementarity between crop and livestock production, due to the synergies in crop and livestock systems. Still, a sizable proportion of the households (28 percent) considered off-farm participation in combination with crop and livestock production as joint livelihood strategies. However, only four percent of the households were engaged in all the four options. Unsurprisingly, about two percent were dependent on non-agricultural livelihood strategies. About 0.44 percent of the sample households depended on off-farm works, 0.88 percent on transfer income, and 0.44 percent on both off-farm and transfer incomes.

Table 8.2: Joint and marginal probabilities of adopting alternative livelihood strategies (%)

Percent adopting the livelihood strategies	Joint probability	Marginal probability			
		Crop	livestock	off-farm	transfer
Crop only	15.35	15.35	--	--	--
Livestock only	0.88	--	0.88	--	--
Off-farm only	0.44	--	--	0.44	--
Transfer only	0.88	--	--	--	0.88
Crop and livestock	36.84	36.84	36.84	--	--
Crop and off-farm	3.95	3.95	--	3.95	--
Crop and transfer	1.32	1.32	--	--	1.32
Livestock and off-farm	2.19	--	2.19	2.19	--
Livestock and transfer	--	--	--	--	--
Off-farm and transfer	0.44	--	--	0.44	0.44
Crop, livestock and off-farm	28.07	28.07	28.07	28.07	--
Crop, livestock and transfer	5.26	5.26	5.26	--	5.26
Crop, off-farm and transfer	0.44	0.44	--	0.44	0.44
Livestock, off-farm and transfer	--	--	--	--	--
Crop, livestock, off-farm and transfer	3.51	3.51	3.51	3.51	3.51
Total	100				

Source: Own computation from household survey data

Though a smaller proportion of households adopted transfer income as a livelihood strategy, secondary sources of data show the numbers of those who use it as a strategy have increased over time. In 2010, about six percent of the households received a transfer income, but this number increased to 12 percent in 2015. According to in-depth interviews (Int. codes no. 41 and 42, 2015), households in the study areas try to send out their children to Sudan and Middle East countries, in order to generate additional income for the household.

8.3.2. Unconditional and conditional probabilities of adopting alternative livelihood strategies

The unconditional and conditional probabilities of choosing alternative livelihood strategies are presented in Table 8.3. The unconditional probability of a crop production strategy is 95 percent, and this increases to 96 percent with the choice of livestock production strategy. This choice of crop production strategy increases further to 100 percent when combining livestock and transfer income strategies or choosing a combination of livestock, off-farm, and transfer income strategies. The result is in agreement with the result shown in Table 8.2 and suggests complementarity among these livelihood strategies. This may be due to resource sharing (in the form of cash, traction, manure) from these strategies, which is important for enhancing the productivity of crop production. However, one needs to note the complementarity effect of choosing a combination of livestock, off-farm, and transfer incomes on choosing crop production and what happens when the livestock component is not in the combination. The choice to combine off-farm income and transfer income decreases the probability of choosing crop income to 90 percent. This shows the strong complementarity of crop and livestock income strategies. It is also an indication of the indispensable role of livestock in family farmers' livelihoods. The complementarity effect is also observed in the probability of off-farm work participation, which increases to 43 percent conditional on the choice of a combination of crop and livestock production strategies. This complementarity could be in terms of generating financial resources from crop and livestock production for petty trade, and non-agricultural business. However, individually, participation in off-farm work is substitutable with the choice of crop production strategy but complementary to the choice of livestock production strategy. For instance, the probability of choosing a crop production strategy decreases to 92 percent for a household participating in off-farm work, and the probability of participating in off-farm work decreases from 39 percent to 37 for a household that chooses a crop production strategy.

Table 8.3: Unconditional and conditional probabilities of adopting alternative livelihood strategies

	Crop	Livestock	Off-farm	Transfer
$P(Y_K=1)$ (unconditional)	0.95	0.77	0.39	0.12
$P(Y_K=1\|Y_C=1)$	1	0.78	0.37	0.11
$P(Y_K=1\|Y_L=1)$	0.96	1	0.44	0.11
$P(Y_K=1\|Y_O=1)$	0.92	0.87	1	0.11
$P(Y_K=1\|Y_R=1)$	0.88	0.74	0.37	1
$P(Y_K=1\|Y_C=1, Y_L=1)$	1	1	0.43	0.12
$P(Y_K=1\|Y_C=1, Y_O=1)$	1	0.88	1	0.11
$P(Y_K=1\|Y_C=1, Y_R=1)$	1	0.83	0.37	1
$P(Y_K=1\|Y_L=1, Y_O=1)$	0.94	1	1	0.10
$P(Y_K=1\|Y_L=1, Y_R=1)$	*1.00*	1	0.40	1
$P(Y_K=1\|Y_O=1, Y_R=1)$	0.90	0.80	1	1
$P(Y_K=1\|Y_C=1, Y_L=1, Y_O=1)$	1	1	1	0.11
$P(Y_K=1\|Y_C=1, Y_L=1, Y_R=1)$	1	1	0.40	1
$P(Y_K=1\|Y_C=1, Y_O=1, Y_R=1)$	1	0.89	1	1
$P(Y_K=1\|Y_L=1, Y_O=1, Y_R=1)$	*1.00*	1	1	1

Source: Own computation from household survey data

8.3.3. Adoption decisions behind alternative livelihood strategies

The MVP model[17] for the choice of different livelihood strategies is estimated using the maximum likelihood method on various family farmers' risk perception variables. We run two different model specifications, the model of household risk perception with, and without other socioeconomic variables. The model specification without socioeconomic variables indicates which of the household's risk perception variables are most significant and therefore require better understanding regarding which household types should be targeted when designing investment programs addressing the food insecurity risk due to various shocks. The model with socioeconomic variables contributes to our knowledge regarding which household risk perception variables are important in the presence of other conditioning socioeconomic circumstances. While the shorter

[17]The results are obtained with a Stata routine following Cappellari and Jenkins (2003).

version of the model is presented in Table 8.5, the extended model with specifications including various socioeconomics variables, together with household risk perception variables, is presented in Table 8.6. The results of the data analysis show that the Wald test [$\chi^2(92)=1056.78$, Prob. > $\chi^2=0.000$] of the hypothesis that all regression coefficients in each equation are jointly equal to zero is rejected, thereby indicating that the model fits the data very well. The log likelihood ratio [$\chi^2(6)= 11.58$, P=0.07] that tests the null hypothesis that the covariances of the error terms across equations are not correlated is also rejected. This is supported further by the significant pairwise coefficient between the error terms of equations for the three livelihood strategies.

The pairwise correlation coefficients between the error terms in the equations for choosing different livelihood strategies, derived from the multivariate probit model, are presented in Table 8.4. These correlation coefficients show the interdependence between the decisions to choose different livelihood strategies, as indicated in the conditional and unconditional probabilities section above. The correlation coefficients are statistically significant in three out of the six possible combinations. Positive coefficients show the complementarity of the pairs of livelihood strategies, while the negative coefficients show their substitutability. Table 8.4 shows the choice of crop and livestock production strategies, and livestock production and participation in off-farm income activities are complementary to each other. The choice of crop production and off farm work participation, crop production and transfer, livestock production and transfer, and off-farm work and transfer incomes are substitutes to each other.

Table 8.4: Correlation coefficient of error terms obtained from the estimates of MVP model

Pairs of livelihood strategies	**Correlation coefficient**
Crop and livestock	0.182(0.145)
Crop and off-farm	-0.040(0.149)
Crop and transfer	- 0.490(0.293)*
Livestock and off-farm	0.327(0.149)**
Livestock and transfer	-0.167(0.150)
Off-farm and transfer	-0.437(0.173)**

Note: *p<0.10, **p<0.05, ***p<0.01;

Source: Own computation from household survey data

The results in Table 8.5 and Table 8.6 show that the parameter estimates of most of the risk perception variables maintain their signs and significance in both specifications. Household risk perceptions of food prices, loss of assets, and family member sickness have a statistically significant effect on a household's choice in terms of different livelihood strategies in the shorter version of the model (Table 8.5). Household risk perceptions of flooding are statistically significant in the extended model but not in the shorter version.

Table 8.5: The multivariate probit model estimation on the choice of different livelihood strategies (using risk perception variables only)

	Crop production		Livestock production		Off-farm work		Transfer income	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Perceived drought risk	-0.311	0.292	0.706***	0.229	0.660***	0.184	-0.28	0.254
Perceived flood risk	-0.201	0.307	0.31	0.221	0.02	0.193	0.118	0.245
Perceived hail storm risk	-0.32	0.294	-0.122	0.218	0.191	0.196	0.029	0.226
Perceived crop pest risk	-0.067	0.348	0.498**	0.248	0.338	0.259	-0.205	0.298
Perceived high input price risk	-0.238	0.581	0.806**	0.359	0.377	0.381	4.033***	0.228
Perceived low output price risk	0.663*	0.342	-0.131	0.231	-0.212	0.21	-0.143	0.246
Perceived income risk	-0.184	0.375	0.486**	0.246	-0.105	0.212	0.1	0.262
Perceived high food price	-0.591**	0.287	0.175	0.221	-0.081	0.191	0.131	0.202
Perceived risk of robbery	-0.236	0.528	-0.298	0.327	0.806**	0.33	-0.006	0.435
Perceived sickness of hh member	1.076***	0.378	-0.118	0.23	-0.383*	0.211	0.175	0.238
Risk averse	-0.272	0.371	0.633***	0.221	-0.202	0.2	0.056	0.267
$\chi^2(6)$	11.43							
Prob. > $\chi^2(6)$	0.07							
N	228							

Source: Own computation from household survey data

The results of the MVP model presented in Table 8.6 show that risk perceptions of family farmers on climate-related variables have a negative effect on the probability of choosing crop production as a livelihood strategy. While farmers' perceptions of drought as an important source of food insecurity have a significant and positive effect on the choice of livestock production and participation in off-farm income livelihood strategies, they have a statistically significant negative

effect on the choice of crop production and transfer income livelihood strategies. This implies that farmers often experience crop failures because of drought and hence such farmers are less likely to choose crop production as a livelihood strategy but instead will substitute this with livestock and/or off-farm income. The negative sign of the transfer income is in contrast to the long held belief that farmers that perceive drought risk may also seek transfer income such as food aid. This shows the fact that they seek transfers as a last resort, after they have exhausted all other options in livestock and off-farm activities.

Table 8.6: The multivariate probit model estimation of adopting different livelihood strategies

	Crop income		Livestock income		Off-farm income		Transfer income	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Risk perception								
Perceived drought risk	-0.364	0.339	0.814***	0.231	0.861***	0.235	-0.233	0.4
Perceived flood risk	-0.807**	0.355	0.071	0.244	-0.18	0.304	0.179	0.366
Perceived hail storm risk	-0.425	0.332	-0.147	0.233	-0.047	0.266	0.103	0.351
Perceived crop pest risk	-0.053	0.387	0.593**	0.267	0.094	0.336	0.164	0.486
Perceived high input price risk	-0.625	0.526	0.999***	0.385	-0.677	0.518	4.952***	0.996
Perceived low maize price risk	0.612*	0.336	-0.333	0.261	0.012	0.306	0.393	0.348
Perceived income risk	-0.014	0.409	0.571**	0.291	-0.195	0.338	0.245	0.338
Perceived high food price	-0.133	0.335	0.366	0.247	-0.169	0.274	0.335	0.324
Perceived risk of robbery	-0.399	0.631	-0.615	0.389	0.432	0.397	-0.323	0.621
Perceived sickness of hh member	1.597***	0.467	-0.122	0.253	-0.109	0.277	0.256	0.339
Risk preference								
Risk avers	-0.269	0.438	0.820***	0.25	-0.401	0.314	0.051	0.35
Household characteristics								
ln Family size	0.42	0.524	0.438	0.31	0.52	0.447	-0.516	0.513
ln Age of household head	-0.215	0.763	-1.135**	0.467	-1.500***	0.548	1.982***	0.638
Education of head	-0.019	0.045	-0.042	0.035	-0.043	0.039	-0.046	0.059
Sex of household head	0.834	0.647	-0.77	0.484	0.656	0.572	-0.562	0.781
Social capital								
Friends in leadership position	0.653*	0.376	0.555**	0.248	0.064	0.272	-0.418	0.342
ln Number of relatives	0.263	0.245	0.235**	0.118	0.257*	0.156	-0.310*	0.176
Household assets and constraints								
ln Total farm size	0.685***	0.202	0.25	0.167	-0.495**	0.193	0.533**	0.257
ln asset value	-0.022	0.125	-0.142	0.106	-0.321**	0.135	0.261*	0.136
ln Tropical livestock Units (tlu)	-0.209	0.226	0.168	0.151	0.172	0.195	-0.181	0.247
ln land leas/rent	-0.057	0.044	0.03	0.028	0.400***	0.037	0.450***	0.125
ln Distance from main market	0.510**	0.205	0.034	0.131	-0.341**	0.163	0.207	0.174
Credit constraint	-0.615**	0.278	-0.077	0.218	0.23	0.253	0.353	0.368
$\chi^2(6)$	11.58							
Prob. > $\chi^2(6)$	0.072							
N	228							

Source: Own computation from household survey data

Results of the MVP model reveal that farmers that perceive flooding as an important source of food insecurity risk are less likely to choose crop production and off-farm income as livelihood strategies. The negative sign with off-farm income may imply the importance of farm wages from crop farming, which means that some households obtain wage income by being involved in wage labor activities on surrounding crop fields. However, if these are affected by flooding, this option will be in problem and farm wage may not be a feasible source of income.

Results of the MVP model show that household risk perceptions of crop diseases and pests have a positive and statistically significant effect on the choice of livestock production as a livelihood strategy. As expected, farmers that perceive the risk of crop pests are less likely to be engaged in crop production as a livelihood strategy.

Results of my analysis show that farmers' perceptions of increasing high input prices have a significant and positive impact on the choice of livestock production and transfer income strategies but negative and insignificant effects on the choice of crop production and participation in off-farm activities. This means that family farmers that perceive the risk of high input prices tend to substitute crop production with livestock production and transfer income sources. The implications of farmers' perceptions of high input prices on their choice of alternative livelihood strategies might be the gradual consequences of high input prices on food security of family farmers and the nation at large. High input prices that are not backed with reasonable increases in grain prices discourage farmers (Rashid et al., 2007; Rashid & Dorosh, 2009; Rashid & Negassa, 2012; Franzel et al., 1989) and motivate them to shift away from crop production to other livelihood strategies, which eventually reduces the food production of the nation and causes food insecurity at a larger scale. The negative sign for the probability of adopting off-farm income activities could possibly be due to shortage of financial resources to be engaged in petty trade and other business activities.

Results of the MVP model show that households that perceive the risk of low maize prices as an important source of food insecurity risk have a high propensity to adopt crop income strategies. This may show a tendencies for within crop income diversification in which farmers that perceive low maize price opt for other crops that fetch them better prices. For instance, farmers in the study areas tried to expand their production of pepper and Niger seed (*Guizotia abyssinica*), since maize prices were very low relative to the price of these crops. The negative sign for livestock

income strategies may possibly imply some form of expansion in crop production that compromises grazing land, which eventually compels households to decrease the size of their livestock holding and any associated benefits.

Perceptions of the risk of income failure are one of the reason why our cohort chooses to diversify. Households tend to make trade-offs between a higher total income involving a greater probability of risk of failure and a lower total income involving a smaller probability of risk (Ellis, 2000). As indicated earlier, the major source of livelihood for family farmers in the study areas is crop production. However, this source of livelihood strategy involves a high risk of failure because of the variability in climate variables, diseases and pests, and failure in output and input markets. Accordingly, the results of my analysis show a negative impact of risk perceptions in relation to income failure on the likelihood of choosing crop production strategies. This may explain the higher likelihood of income losses that farmers encounter, due to crop failure or when grain prices fail to cover the costs of even marketing products (Rashid et al., 2007). On the other hand, income from livestock production is the second most important source of income next to crop income. A significant positive impact of risk of income failure on the likelihood of adopting livestock income strategies signifies the choice of livelihood strategies with a lower probability of risk of failure in this regard (Ellis, 2000).

Results of my analysis show that farmers that perceive the sickness of a family member as an important source of food insecurity risk have a high likelihood of choosing crop income strategies. On the other hand, it has a negative impact on the choice of off-farm and livestock income strategies, possiblly because of the effect of illness on labor supply (Sauerborn, Adams, & Hien, 1996). Sales of livestock are the main strategy employed to cope with the financial costs of healthcare (ibid). The negative sign for livestock production strategies could be because the risk perception of illness might be the result of repeated exposure to similar disasters in which their livestock resources might have dwindled in an effort to cover treatment costs.

In addition to the risk perceptions, I also tried to capture how farmers' risk preferences influence the likelihood of adopting different livelihood strategies. After a real pay-off risk experiment in which I let farmers choose from among alternative land/soil, weather, and crop scenarios, I was able to categorize them into risk-averse and risk-neutral. As shown in Table 8.6, being risk-averse has a statistically significant strong positive effect on the likelihood of choosing

livestock production activities as a livelihood strategy. However, such farmers have a low propensity to adopt crop income and off-farm income sources, possibly due to the risk of crop failure as a result of recurring fluctuations in climatic variables. The negative effect on the likelihood of choosing off-farm income might be due to the uncertainties involved in non-farm businesses, which risk-averse farmers might not wish to confront.

The results of the MVP model also reveal the fact that older household heads opt to use transfer incomes. This result complies with the findings of Block and Webb (2001) and Barret and Reardon (2000), which indicated that relatively established households with a lower proportion of working adults derive a larger proportion of their income outside cropping. However, the results of this study show the tendency of being limited to transfer income rather than diversifying, as reported in Block and Webb (2001) and Barret and Reardon (2000). On the other hand, the age of the household head has negative and significant effects on the choice of crop and livestock production, and participation in off-farm work, which may be due to the lower labor capacity of older farmers. This result may require policymakers to develop a social security system that can support older farmers in rural Ethiopia.

Social capital and network variables have mixed effects on the choice of different livelihood strategies. Farmers in developing countries face imperfect markets, including transaction costs and scarce information. For instance, Ethiopian farmers have inadequate information about insurance markets. Under these circumstances, social networks could facilitate the exchange of information, enable farmers to access inputs on schedule, and overcome credit constraints (Winters et al., 2001; World Bank, 2000). The results of the MVP model indicate that farmers with more relatives are less likely to engage in receiving transfer incomes, meaning they are more likely to choose crop and livestock production as livelihood strategies. Kinship networks can improve information flows about new opportunities and potential shocks and also confer other benefits such as better access to finance and inputs (Höllinger & Haller, 1990). They can also serve as an informal insurance mechanism in times of crisis (Quisumbing, 2003). The political connection variable has a positive incentive effect in the choice of crop and livestock production as important livelihood strategies. Connection with local administrators and agricultural officials may lead to better access to technologies, credit, and farm tools supplied by public institutions (Winters et al., 2001; Markussen & Tarp, 2014). The above results could imply that local rural

institutions and service providers need to be supported, because they can assist farmers effectively by providing credit, inputs, information, and stable market outlets.

As is normally expected, households with larger farms have a high propensity to adopt crop income and less of a propensity to adopt off-farm income as their livelihood strategies. However, such farmers also have a high likelihood of adopting transfer income. This association between larger farm size and transfer income could possibly be because of the concentration of land in the hands of older farmers, who usually seek transfer income (Dercon, 1999). Results of this study also reveal that households that have relatively larger farm and household assets have more of a propensity to adopt transfer incomes and less of a propensity to adopt off-farm income compared to those with fewer assets in terms of value. This finding is also consistent with that of the age of household heads. Older household heads that have accumulated different assets during their working life have a higher propensity to seek transfer income, since they might not be able to engage in the other three livelihood strategies.

Failure in the credit market is one of the motivations for households diversifying into off-farm and transfer income strategies, in order to use the cash generated from these activities to procure agricultural inputs (Binswanger, 1983; Reardon et al., 1992; Ellis, 2000). However, because of the substitution between participating in off-farm activities and crop production, attempts to diversify livelihoods to off-farm and transfer income activities will reduce the likelihood of choosing crop production activities. Though it is not statistically significant, the results of the MVP model show that farmers facing credit constraints are more likely to choose off-farm and transfer income activities. However, there is a statistically significant negative propensity for these farmers to choose crop production strategies. On the other hand, farmers that face credit constraints often depend on sharecropping or have to rent out their farmland. As indicated earlier, 55 percent of the sample farmers reported they leased out their farmland and obtained about 2,100 ETB/year on average in 2015. About 50 percent of households that leased out their farmland in 2015 were credit-constrained farmers. The other 50 percent did so due to old age and shortage of labor. However, the results of the MVP model reveal that farmers who enjoy a larger income from leasing out their farmland have a high probability of choosing off-farm activities and transfer income, and a negative propensity to choose crop production as their livelihood strategies. This means that they have already leased out their land and may find it

difficult to get back into agriculture. This concern needs strong policy attention, in order to address the credit demands of poor family farmers. In a nutshell, the choice of off-farm and transfer income strategies is directly or indirectly related to credit constraints, as indicated by Ellis (2000).

One of the constraints to the family farmers is the distance of their residence away from their main markets. In this regard, distance from residence to market has a significant positive impact on the likelihood of choosing crop production activities, while, on the contrary, there is a significant negative impact of this variable on participation in off-farm activities. These findings indicate the fact that farmers closer to the market are more likely to engage in off-farm activities than those located in more remote areas. This is in line with the findings of Abdulai and CroleRees (2001), in which they indicate that households with superior access to markets are in a better position to diversify their livelihood strategies to non-crop production activities. Barrett et al. (2005) also indicated an increase in the importance of crop and livestock livelihood strategies and decreasing diversification with increase in distance from the main market.

8.3.4. Number of livelihood strategies adopted

Table 8.7 presents the results of an ordered probit model. The result describes which factors influence how many livelihood strategies are chosen. Although the estimated parameters are not interpreted directly per se, the parameter estimates indicate that most of the household risk perceptions, and some socioeconomic characteristics, are statistically significant in explaining the intensity of livelihood strategies used at the farm household level.

The estimation results show that as in the livelihood strategy choice decision, household risk perceptions of drought, pests, and input prices are positive to increase the number of livelihood strategies. Farmers who perceive these risks consider livelihood diversification as an ex-ante risk mitigation measure, and hence they increase their options. With household's perceptions of these shocks, the marginal probability of choosing more than two livelihood strategies increases by about 10–20 percent. Table 8.7 also shows the importance of social capital network variables in explaining the intensity of livelihood strategies. A kinship network has positive and significant effects on the likelihood of choosing more than two livelihood strategies. With a one percent increase in the number of relatives around a village, households are five percent more likely to

choose more than two livelihood strategies. This can help farmers provide contingency measures to deal with increasing risk and alleviate the consequences of food insecurity by providing advice and support on how to diversify accordingly. In a multi-country analysis, Wood et al. (2014) also showed that farmers who participate in social institutions are more likely to make changes in farming practices than those that are not members of such groups.

Farm-related variables, such as land rent, as measured by income earned from renting land, have a positive impact on the number of livelihood strategies. A one percent increase in income from land rental increases the chance of choosing more than two livelihood strategies by about eight percent. With regard to household head characteristics, the results show the negative and significant effects of education on increasing the intensity of livelihood strategies. With additional years of household head's education, the probability of choosing more than two options decreases by about two percent. Using farmers' education level as a factor influencing livelihood strategies is common in the economics literature. This variable reflects the household's human capital stock and may increase an individual's ability to acquire, understand, and implement knowledge-intensive strategies so that they can increase returns from using these practices relative to old strategies. However, as discussed above, education has a negative sign in the livelihood intensity model. The negative effect of education has been reported previously in other studies (Pender and Gebremedhin 2007; Kassie et al., 2012). Two reasons may be suggested in this regard: A higher level of education may increase the opportunity cost of staying on a farm or low skilled off-farm job, and hence it provides the opportunity for moving out from these livelihood strategies. Additionally, the education system may not be oriented to improve existing livelihood strategies.

Table 8.7: Coefficients of the ordered probit model and their marginal effects

Variables	Ordered probit		Marginal Effects				
	Coefficients	SE	Probe(Y=0/X)	Prob(Y=1/X)	Prob(Y=2/X)	Prob(Y=3/X)	Prob(Y=4/X)
Perceived drought risk	0.403**	0.17	-0.00028	-0.0616*	-0.0835*	0.137*	0.00828
Perceived crop pest risk	0.359	0.221	-0.00043	-0.06720	-0.0520*	0.11500	0.00492
Perceived input price risk	0.607*	0.34	-0.00136	-0.13600	-0.04290	0.175*	0.00575
ln number of relatives	0.152*	0.087	-0.00012	-0.02490	-0.02850	0.05100	0.00261
ln land leas/rent	0.226***	0.025	-0.00018	-0.0371***	-0.0424***	0.0758***	0.00388*
Education of head	-0.062**	0.029	0.00005	0.0102*	0.0116*	-0.0208*	-0.00106

Source: Own computation from household survey data

8.4. Discussions and conclusions

In this study, emphasis is given to the fact that the family farmers' perceptions of food insecurity risk are the results of their exposure to different shocks and experiences in the governance of these shocks (Barrett et al., 2000; Doss et al., 2008). Taking this as a foundational concept, this chapter focuses on the linkage between risk perceptions and risk assessment and management strategies. More specifically, it takes this concept into the perspectives of family farmer's decisions in the choice of different livelihood strategies. This is because family farmer's responses to food insecurity risks are manifested in their choice of the different livelihood strategies. Taking this into account, I shed light on gaps in the conceptualization of risk perception and their linkage to the choice of different livelihood strategies in the sustainable livelihood framework.

Analysis of the data in this study was made using a systems approach to determine jointly the decisions to choose multiple types of livelihood strategies. Accordingly, the results of the MVP model revealed the interdependence of various livelihood strategies. For example, the choices of crop and livestock production strategies, and livestock production and off-farm income generation activities, were complementary. Crop production is the largest source of livelihood, both in combination with other livelihood strategies and on its own. Adopting livestock production, and a combination of livestock production, off-farm, and transfer income strategies, were found to increase the choice of crop production activities. This shows the role of adoption of multiple livelihood strategies in re-enforcing the choice of crop production activities. This re-enforcement could be in terms of sharing resources among the different livelihood strategies in the form of cash

for investment in crop improvement, traction power, manure, and spreading risk among diversified livelihood strategies. Similarly, the choice of livestock production activities was found to increase with adopting crops only, a combination of crops and off-farm income, a combination of crop, off-farm and transfer incomes, and off-farm income alone. This also shows the contribution of adopting different livelihood strategies to increase the choice of livestock production activities. This contribution could be in terms of sourcing cash for investment in livestock production activities and feed (crop residues). I understood that choosing off-farm income strategies increases with adopting livestock, a combination of crop and livestock, and a combination of crop, livestock, and transfer income strategies. This in turn could be through the generation of finance for non-farm businesses.

Results of the MVP model revealed that farmers that perceive the risk of climate variables such as drought, flooding, and hailstorms, crop pests, high input prices, income failure, and sickness of a household member have a low propensity to choose crop production strategies. This means the policies promoting the piecemeal adoption of livelihood strategies such as crops alone may not succeed in ensuring food security through increased crop production since most of the drivers behind the decision to choose crop production as a livelihood strategy are negative. However, policymakers and planners would need to use the notion of interdependence between the adoption decisions of farmers, i.e. it would be wise to look into the complementarity effect in the adoption decisions of family farmers. For instance, perceptions of drought risk have a positive, statistically significant impact on adopting livestock and off-farm livelihood strategies but a negative impact on choosing crop production strategies. However, as indicated earlier, adopting livestock income strategies increases the likelihood of choosing crop production strategies. This means that it is possible to encourage increased crop production activities by promoting interventions which support adopting livestock activities. The same is true for those farmers that perceive the risk of crop pests, which has a significant positive impact on the choice of livestock strategies and a statistically insignificant negative effect on crop strategies. However, since crop and livestock production are complementary, interventions promoting the adoption of livestock production will increase the likelihood of choosing crop production. Perceptions of high input prices also have a significant positive impact on adopting livestock and transfer strategies, but adopting a combination thereof increases the likelihood of choosing crop and off-farm income strategies.

In a nutshell, knowledge about the interdependence between the different livelihood strategies is a very useful input in preparing policies and plans to promote the food security of the nation in general and family farmers in the study areas in particular. In this regard, due consideration needs to be given to mechanisms to promote adopting a combination of multiple livelihood strategies rather than the piecemeal adoption of different livelihood strategies. Taking this into account, I have analyzed the drivers of adopting multiple livelihood strategies. Accordingly, the results of this study show that perceptions of drought, crop pests, and input prices as sources of food insecurity risk increase the marginal probability of choosing more than two livelihood strategies by about 12-20 percent. This means that farmers that perceive these sources of food insecurity risk consider livelihood diversification as an ex-ante risk mitigation measure and increase their number of livelihood strategies. More specifically, those farmers that perceive the danger posed to their food security by the specified risk have a higher likelihood of adopting multiple livelihood strategies than others. This implies the need to work on the awareness of farmers of different risks, so that they properly consider the past in order to prepare themselves for the future.

Apart from the risk perception parameters, having a good social network in the village was found to increase the marginal probability of adopting multiple livelihood strategies. This means farmers that have better social networks are more likely to diversify and adopt multiple livelihood strategies. This implies the need to encourage strong social networks, since they can support the household through information sharing, mitigating risk, labor sharing, relaxing credit constraints, and enabling timely access to inputs (Barrett, 2001; Fafchamps & Minten, 2002; Isham, 2002; Bandiera & Rasul, 2006; Marenya & Barrett, 2007).

The higher age of household heads, farm size, and the value of farm and household assets were found to increase significantly the probability of adopting transfer income strategies. A closer look at these variables reveals the fact that they are more or less related to older age of household heads. Most of the larger farm plots in Ethiopia are found in the hands of older farmers, who had the opportunity to acquire land during the initial land distribution program in the mid-1970s. However, being older, such farmers might not be able to continue engaging in crop, livestock and off-farm livelihood activities; rather, they become more dependent on transfers as their age increases. Such households either try to send out family members to work abroad or get them

employed in off-farm jobs. In order to save those who do not have such options from being food insecure in old age, we recommend policy actions in terms of devising an appropriate social security system that will support this particular cohort. This might also be part of the solution for illegal human trafficking to the Middle East and other parts of the world.

9. Synthesis of the Theoretical Contributions

9.1. Introduction

This study focused on the perceptions, assessment, and management of food insecurity risk among smallholder family farming households in three *woredas* in the Oromia regional state, southwest Ethiopia. In the conceptual framework for this study, the term 'risk' was defined as "exposure to uncertain events that may have unfavorable consequences on human health, life and wellbeing, the built and natural environment" (Hardaker, 2000). However, after investigating how family farmers and other actors conceptualize the term risk, I also understood how people come to understand it. The evolutionary risk governance framework involves considering the evolutionary path of the different elements of governance and how people understand their contexts and conceptualize problems. Analysis of the evolutionary path in different parts of the thesis revealed that people try to maintain their narratives over generations and conceptualize different problems in terms of these narratives. On the other hand, the dominant narratives of people are the products of their history, identity, values, priorities, environment, goals, and expectations. Since conceptualizations of the problems are driven by the dominant narratives in a given society, any event or phenomenon that runs counter to these narratives, or things that tend to deviate the well-established narratives of society, might be taken as risk factors (Luhman, 1984). Basically, for any person with clear goals and expectations, risk is something that distracts her/him from achieving that goal or something that impedes the actor from achieving her/his expectations (Figure 9.1). For instance, for a family farmer striving to ensure the food security of her/his household, anything that impedes the achievement of this goal and exposes the household to food shortages is a source of food insecurity risk. What has to be emphasized here is that the goals and expectations might also be influenced by dominant narratives within society. According to Renn (2008), there is a difference between risk and hazards. "*Hazards signify the internal characteristics of the risk agent (source of risk) to cause potential consequences that obstruct the achievement of expectations of people while risk is the potential effect that might happen on humans (their welfare), their belongings and the environment they want to maintain according to their dominant narratives.*" The risk (potential) effect may happen, or not, depending on the level of exposure of people, their artifacts, or the built environment to hazards, the vulnerability of the target victims, and the level of resilience built to

tolerate the incident as a result of exposure to hazards. In this case, the term 'exposure' describes contact of the hazard-carrying agent with the subject/victim, while vulnerability to risk describes actually being hurt or attacked by the hazard (Aven & Renn, 2010). Resilience implies the capacity of the target or subject exposed to the hazard to protect himself or the system against the consequences of such exposure (ibid).

Risk perception refers to the intuitive and subjective judgement of the likelihood of a specified type of accident happening and how concerned we are with the consequences (Paul Slovic, 1987; Sjöberg et al., 2004). Moreover, it is the likelihood of a risk causing agent against someone's goals and expectations that are usually constructed out of the dominant narratives of society in which the person exists. According to this definition, perceiving risk involves evaluating the likelihood of the risk and intuitively judging the consequences (Sjöberg et al., 2004). At the rural household or community level, risk perception is the basis for assessing the severity and consequences of risk, and the management strategies taken in response to the potential risk.

9.2. Evolutionary risk governance framework

By governance, we mean a form of coordination involved in taking collectively binding decisions in a given community involving diverse groups of government and non-government actors, as well as formal and informal institutions (Beunen et al., 2015; Nye & Donahue, 2000; Van Assche et al., 2013). Evolutionary governance theory (EGT) is a theoretical framework for explaining governance from an evolutionary perspective (Van Assche et al., 2013). It considers governance and its elements as constantly changing, and it emphasizes the co-evolution between discourses, actors, institution, power, and knowledge. According to Van Assche et al. (2013), EGT offers a perspective on the way institutions, markets, and societies evolve. ERGF is the application of the basic ideas and principles of EGT to the perceptions, assessment, and management of risk at the household and community levels. Furthermore, ERGF understands the fact that farming households are exposed to several ecological and socioeconomic risk/shocks (Suess-Reyes & Fuetsch, 2016) that may influence their dominant narratives, goals, and expectations. ERGF considers the importance of linkages between risk perception, risk assessment, and risk management.

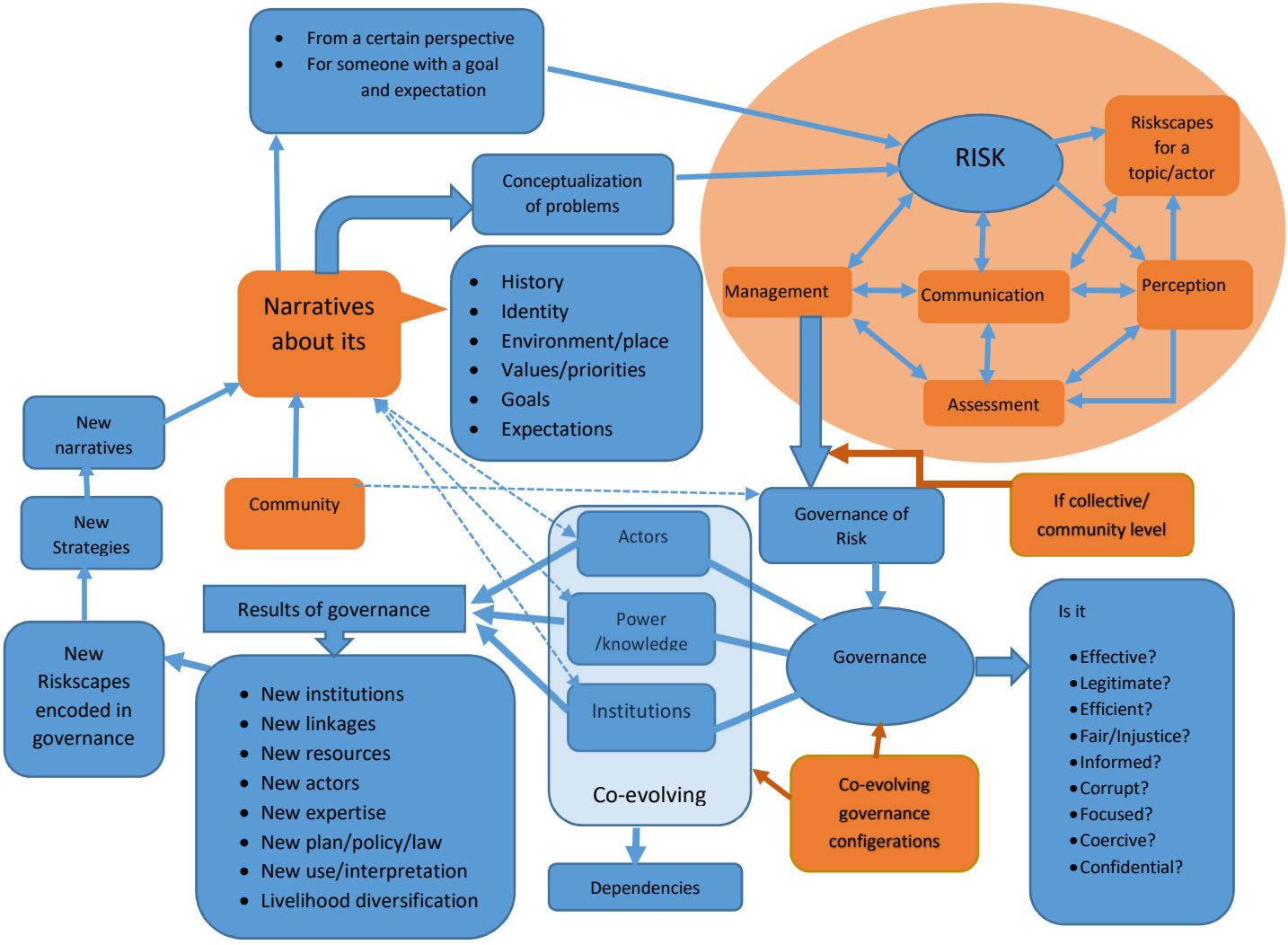
The framework also underscores the fact that risk perception is the result of exposure to shocks (Gloede et al., 2015), socio-cultural, historical and political factors that may affect someone's expectations and goals, which are rooted mainly in dominant narratives of society. These factors could be the result of the actions of global or local actors, or institutions or discourses. In this study, two aspects of risk perception (Figure 9.1) were considered: The general risk perceptions and perceptions of a certain risk in a specific location by different actors that are different from their own perspectives and thereby form different riskscapes (Müller-Mahn & Everts, 2013). In the latter case, each actor in a certain location can have his own riskscapes. These riskscapes can partially overlap or contradict each other. This means the response strategies developed by different actors can create new risks that may need new risk management strategies.

Once a given farmer has developed perceptions based on exposure to different shocks and how these shocks can be managed at different times, these perceptions will serve as perspectives or lenses for assessment of similar risks that may happen in the future. This assessment could be in terms of the impact of the potential risk on food security, its predictability, likelihood of occurrence, whether it is possible to avoid this risk (avoidability), recoverability, or other dimensions. The perception of risk is also a basis for risk management strategies. This is because people learn from how similar shocks were managed in the past. They refer to stories about these risks, what aspects of their narratives (identities, their built environment, physical belongings, and social networks) the risk affected, who were the major victims, and how households and the community survived. In addition, people learn from how different actors responded to these shocks, how resources were utilized, and what formal and informal institutions effectively served to manage the situation. As the core aspect of a risk management strategy, I argue that a household's choice of livelihood strategy is the result of its perception of risk. According to the sustainable livelihoods framework (SLF), the choice of livelihood strategy is influenced mainly by the household's access to assets (Scoones, 1998; Norton & Foster, 2001). The SLF also stresses the importance of the vulnerability context in which people's livelihoods and the availability of assets are affected by critical trends, shocks, and seasonality over which they have very limited control. The SLF emphasizes the role of transforming structures and processes (actors, institutions and culture) in shaping livelihoods by determining access to different capitals, the terms of exchange between the capitals and returns to any given livelihood strategy. However, the SLF does not indicate the role of these shocks, trends, seasonalities, actors, institutions, or the resulting

access to resources on the perceptions of people of the risk they may face and how they intend to overcome it, including their choice of different livelihood strategies. From the ERGF perspective, I argue that trends indicated in the SLF, shocks, and seasonality form the basis for the risk perception of households. The risk perception of households in turn plays a key role in the choice of different livelihood strategies, in order to achieve their livelihood outcomes, which can also be treated as a risk governance strategy.

When risk management is a matter of community governance, of collectively binding decision-making, extending beyond a small circle, we speak of risk governance (Figure 9.1). If we see governance as co-evolving governance configurations, risk governance has to be understood as evolving, too, in that one has to understand current perceptions, assessments, and management forms as deriving from pre-existing sets of actors, institutions, and forms of knowledge. Knowledge includes here both local and expert knowledge, knowledge structured as narrative, and knowledge subtly embedded in narratives.

Being a collectively binding decision-making process, evolutionary risk governance is a multilevel governance process that has to be evaluated against the basic principles of governance: Effectiveness, legitimacy, efficiency, fairness, coercion, and so on (Figure 9.1). As indicated in Figure 9.1, the ERGF involves the configuration and co-evolution of actors, power/knowledge relations, discourses, and institutions. In this study, institutions are understood to represent a system of established and embedded social rules that structure social interactions (Hodgson, 2006). Institutions can be formal, informal, or dead (Van Assche et al., 2014).



Source: Own sketch

Figure 9.1: Modified version of the evolutionary risk governance framework as a locked loop

Formal institutions are "the rules that are considered as the one that are supposed to govern interaction in a given situation (Van Assche & Hornidge, 2015)". According to North (1991), informal institutions are "social codes of conduct and socially acceptable behaviors that are transmitted through generations involving cooperation, collaborative learning and self-

organization." Basically, formality is the result of power relations in the society in which the most powerful actors define the social rules of the game that should be enforced throughout the system (Van Assche & Hornidge, 2015). This means that formal institutions are imposed from outside, while informal institutions are inherent to the local community (Stellmacher, 2007). Since formality is the result of power relations, a once formal institution may turn out to be informal with a shift in power relations (Stellmacher, 2007; Van Assche & Hornidge, 2015). In line with this notion, analysis of the evolutionary path in the last four major regimes reveals that formal institutions during the Gada administration for community governance were replaced by the formal centralist administration of the imperial regime. However, the local community maintained its local governance systems during the Gada system under the umbrella of the local self-help organizations known as *rejis/idirs*.

Tridico (2004) describes informal institutions as carriers of history that have passed the test of historical time. For instance, the local community in the study areas associates the function of councils of elders, called *jarsa biyya* and *shanee*, with their ancestors, and these can be traced back to the *Gada* system. These institutions portray lots of history about how the community was governed by the *shanee* during the *Gada* system. Moreover, informal institutions are the results of an evolutionary process in which society develops its own codes of conduct, in order to overcome different challenges that may not be addressed fully by formal institutions. This means that the unpredictable nature of different risks makes it difficult to address them immediately through formal institutions. The results of the institutional analysis in this study, using an ERGF, show that informal institutions evolve depending on issues emerging in the community. In a rural community, these may include threats to the values, identities, environment, goals, and expectations that form the basis of the problem definition of society. For instance, one of the rules formulated in the *shanees* of the rural communities in Bako-tibe *woreda* restricts extravagant expenditure on wedding celebrations, dowries, and the amount of people accompanying the groom to take the bride. This was the reaction of the informal institution against the threat to the norms and values of the rural community which may devastate the livelihoods of people by depleting resources spent on unproductive events. Since the formal institution had no means of controlling such social concerns, the rural community legislated and implemented its institutions to control the social action through *shanees*. This means that the rural community relies on informal institutions to govern risk that might not be legitimate for formal institutions.

The effectiveness of informal institutions varies according to location and proximity to urban centers. The variation with location is because of the nature of problems in different locations which form the basis of social concerns that derive mechanisms to overcome them. For instance, the robbery of livestock was more of a severe problem and a source of food insecurity risk in Bako-Tibe *woreda* than in the Kersa and Omonana *woredas*. In places where the risk of livestock robbery was so serious, the rural community relied on informal institutions rather than the formal options. This is mainly because of the difficulty in finding readily available evidence about suspected robbers to take the case to a formal court, since robbery of livestock usually takes place in a very underground and shadowy manner. This made the rural community in such locations to rely on informal institutions, since they have very powerful tools to unravel evidence and trace lost property. These powerful tools are rooted in religion, traditional beliefs, and social sanctions. In order to handle the case without any form of partiality, the activities of the *shanee* start by swearing-in its serving members in religious and traditional beliefs that are highly respected and venerated in the area. In a similar way, everybody that will pass through the fact-finding process of the *shanee* also swears not to hid any evidence on the issue under investigation. Those people who hid information they know about the case under investigation will be penalized by the community as collaborators of the robbers. The social sanction is the most powerful tool, since a person on the receiving end is excluded totally from the community. Proximity to urban centers, on the other hand, influences the effectiveness of informal institutions, since formal institutions are stronger in such areas due to the concentration of actors implementing the formal institutions. This means the effectiveness of formal institutions also varies according to proximity to urban centers. The farther one moves away from an urban center, the less effective the formal institution and the more effective the informal one. This implies the complementarity of formal and informal institutions, in that the latter fill the gaps where the implementations of the former become weaker.

Both formal and informal institutions evolve alongside social dynamics, in order to address risk to livelihoods and the food insecurity of people. According to the observations I made at the study areas, evolving informal institutions serve as indicators of the social concerns of a rural community, which might be addressed later by formal institutions. In some cases, informal institutions may jump into cases that become too costly and time-consuming to go through a formal institution. For instance, the government has been working on creating public awareness to curtail

female genital mutilation and the health risks associated with this practice. Despite efforts made through the mass media and government structures, though, the mutilation practice has continued in rural areas for years. After all the efforts made through the formal institution were found to be of limited success, informal institution was legislated through the network of *shanees* (*wirtu*) against those who practice female genital mutilation.

Sound rural governance needs the balanced interplay between formal and informal institutions (Stellmacher, 2007). This is because neither the formal nor informal institutions on their own can ensure sound rural governance. Unlike in urban areas, which depend largely on formal institutions, informal institutions play a much greater role in setting norms and social values, codes of conduct guiding social interactions, and peace and stability in rural areas. However, this does not mean that informal institutions are substitutes for formal institutions (ibid); rather, they can complement each other. However, because of power relations in society, formal institutions have a high tendency to suppress informal ones, or actors implementing formal institutions abuse informal institutions. This in turn signifies the presence of several different actor-institution and power-knowledge configurations, which influence local livelihoods and social interactions in rural areas. Since these configurations are the results of macro- and micro-level social and administrative structures, it is mandatory to understand social organizations and the way they evolved over time. This is to understand how the community has operated in the past, which positive aspects of community operations have been carried over and currently serve good purposes. It is also important to understand what weaknesses have been felt in the past organization and functioning of the community, and how these have been improved and reshaped in the current organization of the community, or, alternatively, which ones still resonate. This is because important social organizations that have been effective in governance of different risks might still serve similar purposes with adjustments to socio-political dynamics in society. According to my observations in the study areas, the community preserves some past social organizations as legacies of their ancestors. Some of these social organizations are re-introduced to society when those in power find them useful for certain purposes.

Since actors, institutions, and narratives (as forms of knowledge) co-evolve, this introduces dependencies in risk governance, which means that one cannot simply jump from one understanding to another one, from one tool or solution to a new one, just as one cannot copy ‘best

practice' from other places without considering certain contextual issues. In other words, ERGF underscores that past shocks, and management strategies taken in response to these shocks, have evolved alongside the different institutional and political settings society has undergone. To make sure that past risks do not re-occur, or to create opportunities for timely interventions to control effectively if similar events happen again, there is a need to investigate past events and learn from them (Boin & Fishbacher-Smith, 2011). In other words, it is wise to understand the characteristics and major causes of past shocks, since they can have important implications on the present and future livelihoods of people, their identity, the achievement of their goals and expectations, and their environment. In order to understand the past, which may have an influence on current and future scenarios, ERGF involves the analysis of dependencies (path dependences, interdependences, and goal dependences) as well as power-knowledge and actor-institution configurations.

Path dependencies refer to the legacies of the past that influence the present (North, 2005; Van Assche & Hornidge, 2015). This means that current actors, institutions, knowledge, power relations, and access to resources, to some extent, are influenced by their respective past institutions, actors and their actions, past knowledge, power relations, and the way resources have been managed. However, this does not mean that the governance path necessarily guides current governance in the same direction and at the same pace (Acallon 1991). Instead, one can learn from the past in order to nurture the experience of past strengths, in order to improve the current and learn from past failures and weaknesses in order not to repeat the same path of failure or develop appropriate timely interventions against similar risks (Boin & Fishbacher-Smith, 2011). Lack of willingness or a failure to understand the legacies of past risk governance may lead to production of new risks the impacts of which may outweigh the shocks that have been observed in the past. For instance, the imperial government of Ethiopia tried to hid the food insecurity and famine problems that happened in the early 1970s until foreign media exposed the catastrophic issue to the international community. About 250,000 people died because of hunger, as intervention came too late to rescue many lives (Webb & Von Braun, 1994). This famine, coupled with other problems, triggered public anger that led to the overthrow of the imperial regime (Aredo, 1990; Rahimato, 2009; Webb & Von Braun, 1994). A similar story was repeated in the 1980s. The *Dergue* government was busy establishing the Workers Party of Ethiopia (WPE) and celebrating the 10th anniversary of the revolution, by keeping the news of famine and mass starvation secret

until October 3, 1984 (Jean, 2008). This late declaration of the famine situation delayed the coordination of international assistance to rescue lives. As a result, about a million souls were lost through starvation and associated disease. It is believed that this famine also contributed to the downfall of the *Dergue* regime. This exemplifies the fact that disregard for evolutionary paths creates a way to produce new risks that may cost more than one expects. In other words, the desired outcome of a new form of risk governance is often a new institution, a new policy, a plan or a law, and evolutionary risk governance would warn that this might work if it fully takes into account current dependencies. Otherwise, a new institution is unlikely to link to current actors, institutions, and knowledge in such a way that the outcome comes close to the intention. The outcomes of new risk management and governance become more unpredictable, and the risk strategy may become a new risk in itself. On the other hand, any analysis of governance paths should not just blame the past for all the weaknesses in the current governance, because evolution never stops, and everything, including actors, institutions, discourses, and resources, evolve continuously. That is, path dependency does not mean that "one past leads to one future, nor that the present organization of the community is only viable one, nor that similar cultures always end up in the same situation" (Van Assche & Hornidge, 2015).

Interdependence in the governance path refers to interdependence between different actors, different institutions, and between actors and institutions in a governance process (Van Assche, et al., 2013). It is also a matter of understanding the implications or impact of institutions and/or actors on one another, the potential synergetic effects, or the potential contradictions among the different factions in this regard. Interdependence could also be interpreted in terms of interdependence between different types of risk. Such risks can interact and exacerbate the effect of each other. For instance, the results of the analysis in this study reveal that three major categories of risk, namely climate-related , crop and livestock disease, and institutions related to markets, influence household food security among family farming households. These risks are interdependent, with one exacerbating the effects of the other. The impacts of certain risks also signpost local inequalities among family farmers. The risk of high crop input prices was found to make the management of climate-related risk unaffordable, which calls for the need to have an inclusive (holistic) approach when analyzing evolutionary paths and designing plans, policies, and strategies in response to different risks.

As indicated in Figure 9.1, the results of evolutionary governance could be new institutions and new actors created in the governance process, new resources brought into the system, new linkages between institutions, new expertise, new plans, policies and laws, or new interpretations of institutions. The results of risk governance could also be a new riskscape, which may need new strategies, and this may in turn create new narratives. These new narratives again add up to the already established narratives of society and form the basis for the conceptualization of problems completing the cycle.

10. Conclusions and recommendations

10.1. General

In this study, an evolutionary risk governance framework was employed to investigate the sources of food insecurity risk among family farming households. The evolutionary risk governance framework is an application of the basic principles of evolutionary governance theory to risk governance, and it promotes investigation of the food insecurity risk from different perspectives. This is because it considers the current risk governance strategies of family farming households as results of exposure of the farmers to different food insecurity shocks, response strategies of different actors as well as their access to resources. This chapter presents the major empirical findings drawn from analysis using ERGF, and their implications.

10.2. Major empirical conclusions

10.2.1. Evolution of institutions in rural areas

The analysis of governance in rural communities in Chapter 5 reveals that some community governance systems within the framework of the formal institution have been disrupted by power shifts in society. Despite the dynamics in the formality of these institutions, the rural community ensured the continuity of these institutions in the form of informal institutions. The important institution of note in this case is the informal body implemented by the council of elders, known as a *shanee*. *Shanee* was the formal local governance structure during the *Gada* administration. However, it turned out to be informal after the inclusion of Oromo land in the central government system of Emperor Menelik II. Despite the shift in the power structure, and an end to the role of *shanees* in the formal government system, the community sheltered it in the informal rural self-help organizations known as *reji*s. *Reji* has two distinct councils known as *afres* and *shanees*. The latter is the council of elders that run the informal institutions serving informal community governance together with *jarsa biyya* (different levels of councils of elders). The roles of the *shanee* and *jarsa biyya* involve not only implementing the informal institutions, but also legislating them through their network known as *Wirtu*.

The co-evolution of informal institutions with the social dynamics and evolution of events in society is reflected in the legislation of new customary laws of the rural community, promulgated to handle new developments that put peace, stability, and welfare of the rural community at stake. *Shanees* and *jarsa biyyas* use the powers of religion, traditional beliefs, and social sanctions as important mechanisms to enforce informal institutions. Since *jarsa biyyas, shanees* and their networks are concerned with informal local governance and deal with the day-to-day challenges of the community, they can be considered sensory tools of the local community that seek and then fix social concerns. This means that informal institutions could be taken as indicators for the gaps in formal institutions. In other words, informal institutions serve to complement rather than substitute for formal institutions. Interestingly, however, location, proximity to urban centers, and the nature of social problems were found to shake the effectiveness of informal institutions. They were found to be more effective in locations where there is poor implementation of the formal institutions. People tend to rely more on formal institutions than the informal alternative in areas closer to urban centers, where there is strong enforcement of the former. Moreover, rural households rely on informal institutions to handle cases for which there is no readily available evidence that could go forward to a formal institution. In a nutshell, I found that informal institutions co-evolve with social dynamics and complement their formal counterparts. This means there is a kind of interdependence between formal and informal institutions. Furthermore, since informal institutions are powerful in mobilizing the local community, actors running formal institutions rely on the *shanees* for mobilization purposes. Informal institutions also rely on formal institutions for protection against aggressive members of the community when handling certain important cases.

10.2.2. Re-emergence of social organizations

The results in Chapter 5 reveal that apart from the council of elders, the term *shanee* signifies the next form of social organization after households in the *Gada* system. Five households form a *shanee*, and five *shanee*s form an *olla*. The local community calls coordinators of the community activities during both the imperial and the *Dergue* regimes as *shanees*. However, the purpose of *shanees* during the imperial and *Dergue* regimes was different from their role during the administration under the *Gada* system. The same type of *shanee* with the name *one-in-five*, but

similar both in the size of membership and principles of organization to the *shanee* re-emerged during the current EPRDF government. This social network is now the basis for the new extension approach, known as the participatory extension system (PES). However, since the re-emergence of this social organization in 2010 was politically motivated (for implementation of election campaign) and its leaders were preferably those affiliated with the ruling party, it was considered among the young generation a system imported from outside. The elders, on the other hand, explained that "one-in-five is the legacy of their ancestors." The tendency of resistance or externalization of one-in-five social networks is because of a lack of proper contextualization and legitimization in a way the new generation can understand the origin and history of the one-in-five system.

10.2.3. Farmer typology and the knowledge-power relationship

With the objective of promoting competition among farmers and targeting different types of farmers with extension packages that suit their reception capacity, there is a periodic ranking of farmers into three categories. As intended, the ranking exercise might create a certain level of competition among farmers. However, this practice has never considered the knowledge-power relationship, created because of a lack of access to finance by Type C farmers. There is also the oversight in the meantime of the widening gap created between the extension system and these farmers. Most Type C farmers are not eligible for micro-finance credit and cannot afford to buy agricultural inputs, which compels them to share or lease out their land to Type A and Type B farmers. This means that such farmers are becoming poorer while Type A and Type B farmers are becoming wealthier. Type A farmers have better political participation. The increased acceptance of Type A farmers in the political circle and their influential role in society, is widening the gap in the knowledge-power relationship in rural areas.

10.2.4. Dependencies among institutions

As indicated earlier in the evolution of institutions (Chapter 5), there is interdependence between formal and informal institutions implemented in rural areas. Moreover, analysis of governance

paths in rural development policies and strategies (formal instructions), using the evolutionary risk governance framework, reveals some path dependences. The most important path dependencies relevant to the livelihoods and food security of family farmers are path dependencies among: i) contradictions in land policies, ii) agricultural market stabilization policies, and iii) conditions for access to credit. The imperial government promoted the development of large commercial farms by undermining smallholder farming in the central and southern highlands of the country at the end of the 1960s. This policy caused the displacement of many smallholder farmers as a result. Since land in the country belongs to landlords (and ultimately the state), no compensation was paid to the tenant smallholder farmers. This contributed to public discontent and mass demonstrations against the imperial regime. The current government also promotes the development of smallholder farming and large commercial farms (since 2002). Currently, the ultimate owner of all types of land is the government. Farmers have use rights on land, and when a certain piece is needed for large investments or public services, the holder of the right is obliged to leave by taking compensation determined by law. However, the displacement of smallholder farmers to create space for large commercial farms is again creating public discontent. The problem is that compensation rates set by law are not enough to offset damages to the livelihoods of the victims.

The 1984 famine, which claimed the lives of about one million people in Ethiopia, was associated partly with the agricultural market stabilization policy of the *Dergue* government, which caused entitlement failure to producers and consumers. This policy was characterized by nationally fixed grain prices, the quota-based supply of grain imposed on smallholder farmers and state farms at fixed prices, restrictions on grain movement between markets, and overall control of the market by the government. There is a relative deregulation of agricultural markets by the current government. However, the market stabilization policy is still not abandoned, due to different reasons,—the government is still involved in rationing imported wheat grain at subsidized prices, and there is a ban on exporting certain crops such as maize, whatever the comparative price of the grain in international markets. These measures have been taken with the intention of protecting domestic consumers from the effects of inflation and maintaining a stable grain market. However, family farmers, the major producers of food grains, use subsidy-free inputs to produce these crops, and they compete with imported grain injected into the market at subsidized rates. Moreover, there is systematic price fixing by the Ethiopian Grain Enterprise. For food grains such as maize, for which exports are already banned and domestic prices systematically suppressed, family farmers

express their desperation to eventually decrease production. This was the case in 2002, when the production of cereal decreased by 52 percent, due to the late onset of rainfall, the decreased use of chemical fertilizer, and certified seed being discouraged by the prevailing market prices. The results of this study show that market stabilization policies may discourage the use of improved inputs because of ever-increasing high prices and the challenges farmers face in this regard. The effect of such tendencies of family farmers, because of a lack of market incentives (both inputs and output markets), may drastically harm the production of food grains and also result in entitlement failure for producers and consumers.

One of the challenges that limited the success of the comprehensive package programs during the third five-year development plan of the imperial government was the failure of the credit service to reach out to smallholder tenant farmers. The main reason for this failure was the requirement of the tenants to provide group collateral and the consent of landlords as conditions to access credit. As a result, the major beneficiaries of the credit service, originally intended to benefit smallholder tenant farmers, were the landlords and large, financially able farmers. Currently, different micro-finance institutions provide rural credit services. The major criterion for family farmers is provision of group collateral. However, the results of this study show that most Type C farmers fail to provide group collateral because of their low level of credibility, bad credit history, and lack of assets such as livestock. In other words, the beneficiaries of the credit service are better off farmers that have greater credibility and creditworthiness. This compels poor farmers (those categorized as Type C) to sharecrop or leasing out their plots of land, thereby making them vulnerable to the bad effects of food insecurity. This means that a lack of access to credit continues to be a major source of food insecurity risk in the study areas, mainly because of the path dependent pre-conditions for access to the service. If appropriate policy measures are not taken to overcome this problem, this may drag already resource-poor farmers into deeper levels of poverty and expose them to the worst effects of food insecurity.

Land policies, market stabilization, and credit policies are not only path-dependent, but also interdependent, with each one exacerbating the effects of the other. This means the partial solutions might not help to bring the desired improvements in livelihoods and household food security. These interdependent challenges need holistic measures to disentangle their effects on family farmers.

10.2.5. The different sources of risk and their interdependence

The major sources of food insecurity risk, as indicated in Chapter 6, fall into three categories: sources related to changes in climate variables, sources related to crop pests and livestock diseases, and institution related sources. Family farming households in the study areas use different risk mitigation measures and long-term adaptation strategies against different sources of food insecurity risk. However, use of these strategies depends, among others, on the level of knowledge and experience of the farmers, the level of uncertainty and predictability of the anticipated risk, the availability of inputs for implementation of the adaptation measures, and the financial and technical capability of the farmers. While some of the sources of risk (e.g. changes in climate variables) cause food insecurity, thereby compelling farmers to follow certain adaptation strategies such as using early-maturing crop varieties, institution-related sources of risk re-enforce the problem through impeding the adaptation strategies of family farmers. The effect of the latter sources of risk is through the inflation of input prices and making adaptation strategies unaffordable. This implies that overcoming food insecurity risk needs not only focus on certain sources of risk, but also a broader understanding of the contexts and the pursuance of holistic policies and plans that can address the system rather than the piecemeal approach.

There are significant differences between households in different wealth categories (poorly- and well-endowed households) in terms of their risk perceptions, assessment, and management. More proportion of poorly endowed households perceive the high impact of most risk sources on household food security. However, they fall short of being able to access resources to redress the balance. This means that the impacts of different sources of food insecurity risk highlight local inequalities among family farmers. The local inequalities among family farmers in terms of the level of impact of the different sources of food insecurity risk reveals the need for careful understanding of local contexts.

10.2.6. The riskscapes of the Gilgel Gibe-I hydroelectricity dam

The results of the analysis in Chapter 7 reveal that the Gilgel Gibe-I hydroelectricity dam is at risk of being totally silted up after just one-third of its designed service life. The project displaced 2,476 households, out of which 562 moved to resettlement sites. The remaining households became landless and food and energy insecure. They were living in the surroundings of the reservoir and farming inside the buffer zone. Due to the scarcity of land, the community living nearby the buffer zone engages in intensive farming, which is aggravating the siltation problem and further shortening the service life of the dam. There are different sources of risk in this area: the risk of landlessness, food and energy insecurity, as well as siltation. One risk is the result of the other, and the dependencies among the different sources of risk have created a locked loop cycle. If the different actors only follow their own perspectives and continue promoting interventions targeting their own riskscapes, it might lead to a lose-lose situation with a substantial reduction in the nation's power supply as well as continuous or even aggravated food insecurity in the GG-I project area. In a nutshell, the risks of landlessness, food and energy insecurity, and siltation are inter-connected and interdependent, with one causing the other. The actors, however, often do not understand this notion, and there are no tools (institutions) or arenas (a form of governance actor, a form of organization) where this can be brought to light. A piecemeal risk management approach in this case would be like treating the symptoms of a disease, so what is needed is a holistic approach to understanding the broader perspectives and the interconnected nature of the different sources of risk, by considering the whole set of interconnected sources, i.e. a risk governance (participatory risk governance) approach.

10.2.7. Linkages between risk perception and risk governance

The basic tenet of this research revolves around the premise that the perceptions of family farming households about food insecurity risk are framed by their exposure to related shocks and the governance of these shocks at different times. The study also emphasizes the fact that the risk perceptions of family farmers drive their risk assessment and management strategies. It is also indicated clearly that the risk management strategies of farmers are expressed in terms of their decision to choose different livelihood strategies. The results of the analysis in Chapter 8 reveal

that family farmers in the study areas choose one or a combination of two or more of the four broad livelihood strategies (crop production, livestock production, off-farm, and transfer incomes). The analysis carried out in this study also establishes that household decisions to choose from among these livelihood strategies are not mutually exclusive; rather, there are interdependencies in this regard. For example, the choices of crop and livestock and livestock and off-farm income strategies were found to be complementary, with one supporting the choice of the other. Crop production is the largest source of income on its own and in combination with other livelihood strategies. The choice of livestock production, or a combination of livestock production, off-farm, and transfer income strategies, was found to increase the choice of crop production activities. Similarly, the choice of livestock production activities was found to increase when adopting crops only, a combination of crops and off-farm, a combination of crops, off-farm, and transfer incomes, and off-farm income alone. These impacts of choosing one or a combination of livelihood strategies, on the likelihood of choosing the other livelihood strategy, show the role of adopting multiple livelihood strategies in re-enforcing the choice of different livelihood strategies. Interdependence could be seen in terms of generating cash income for investment in the other, the provision of traction power, and sharing by-products such as manure and crop residues as input in the production of the other. These complementarities and interdependencies also show that policies and plans targeting the improvement of livelihoods and food security need to look into these dimensions, in order to trigger enhancement in the different livelihood strategies. This being a background in the continuum, those farmers that perceive the risk of drought, crop pests and diseases, high input prices, and failure of household income as sources of food insecurity risk have a high propensity to choose livestock production strategies and a low propensity to choose crop production strategies. This means that if one follows a piecemeal approach to promoting crop production and neglecting other livelihood strategies in a community threatened by different sources of food insecurity, food production (which is mainly crop production in the study areas) will be in trouble. However, if one takes into account the interdependence of the different livelihood strategies, it is possible to trigger crop production through the promotion of livestock production and other livelihood strategies that are complementary to crop production strategies.

Knowledge of the factors that favor adopting multiple livelihood strategies at a time is also an important input when preparing plans and policies. In this regard, the results of this study show that farmers who perceive the risks of drought, crop pests and high input prices as sources of food

insecurity are 12-20 percent more likely to adopt multiple livelihood strategies than other farmers. This means farmers that perceive these risks have more tendency to diversify their livelihood strategies than others. This could be because of the bad experiences they had relying on a single livelihood strategy when they faced similar risks in the past and how these risks were managed. In a similar way, farmers that have larger social networks (more of relatives in the area) have more likelihood for diversification. With a one percent increase in the number of relatives, households are five percent more likely to choose multiple livelihood strategies. This signifies the role of social networks in risk governance, due to their role in sharing information, finance, labor, knowledge, and security among the members of the network.

Among the socioeconomic determinants of the choice of livelihood strategy, the effects of age and related factors need special attention. The results of this study reveal that older farmers have a high propensity to choose transfer income rather than other livelihood strategies, and they become more dependent on transfers as their age increases. Such households either try to send family members to work abroad or get them employment in an off-farm job.

10.3. Recommendations

The re-emergence of some social organizations (*one-in-five*, *gare* and *gott*) was observed as being very much politicized and highly marginalized among the youth and urbanities as superimposed structures imported from outside. This was mainly because of the way these social organizations re-emerged into society. While the government declared that it was successful in using such social organizations as social networks, their history and origin were not clearly explained or contextualized. I therefore recommend explaining the history of these social organizations and their origin, as well as their purpose during the *Gada* administration, in order to ensure their internalization among the young generation and to make use of their strong power in social networking for the future development of the country.

Formal and informal institutions were found to be interdependent, with one complementing the other in governing rural areas. It is therefore recommended to support and encourage the activity of councils of elders and local organizations in legislating and implementing informal institutions rather than interfering in their activities. Where possible, it is recommended to build

the capacity of local organizations and councils of elders in the principles of rural governance, in order to enable them to enforce those principles accordingly.

There is a need to consider the path-dependent land policies of the country, to reduce the level of suffering felt by land use rights owners. This would be in terms of revisiting the laws and policies that determine what compensation is paid to those who leave their holding to make way for large-scale investment or public services. The holders of land use rights need to receive either land of equivalent value or a sufficient amount of compensation that will make up for the damage inflicted to their livelihoods. The compensation needs also to take into account the intergenerational dimension, since the holders of land use rights have the right to transfer the land to their legitimate heirs.

Agricultural market stabilization policies might be needed to create stable macro-economic conditions by suppressing food price inflation. However, these market stabilization policies and subsequent measures need to balance the short-term benefits of grain price stabilization and their long-term implications on the food production and entitlement of producers and consumers. This is because stabilization measures may have more adverse effects on the food security situation in the country. As observed during the *Dergue* regime, the ultimate impact of grain market stabilization policy was the worst famine ever, mainly because it discouraged the use of inputs and increasing production, which eventually led to entitlement failure to producers and consumers and exposed the vast majority of the population to famine. Current market stabilization policies focus on distributing imported food grain at subsidized rates and systematically suppressing domestic grain prices. However, the increasing high input prices and relatively low grain prices for crops such as maize discourage use of inputs and may cause stagnant or decreasing production. I therefore recommend balancing the short- and long-term benefits of the stabilization policy and focusing on production-enhancing measures that encourage producers and increase domestic output. In this regard, there is a need to shift subsidies on imported grains gradually to input subsidies, to encourage domestic producers. This may result in medium- to long-term increases in food production and prevent entitlement failure of both producers and consumers.

Being a path-dependent policy, the current conditions for access to micro-finance credit in rural Ethiopia compel farmers to provide proof of group collateral, among other requirements, to gain access to credit. However, since poor farmers categorized as Type C do not have assets and

are not creditworthy, they were observed failing to get group collateral. The requirement to provide group collateral is excluding this cohort and making the rural credit service available only to better off farmers. I therefore recommend creating special social security programs that can help poor farmers build up their assets, in order to make them eligible to access finance. In this regard, experiences with household asset building programs in drought-prone might help in handling the case of resources poor farmers in the 'surplus-produceing areas' of the country.

It might be difficult to have comprehensive, all-encompassing policies, but the design of policies and plans that look to enhance livelihoods and food security among family farmers should not follow a piecemeal approach or be shortsighted. Rather, policymakers and planners need to look into the performance of similar policies and plans in the past, as well as their interaction and interdependence with other policies and plans that may have possible outcomes in the future. There is a need to look into both the positive and negative effects of path dependence and interdependence. This is because the implementation of a certain policy or plan practically affects, or is affected by, other policies and plans.

The results of this study (in Chapter 6) show that family farmers have derived certain adaptation strategies in response to food insecurity risks, due to a crop disease known as *tef* head smut. Farmers in Jimma call this practice *Geniso*, which involves adjusting the planting date of an early-maturing local variety of *tef* known as *saye* and growing it before the weather becomes conducive for head smut disease. However, since *geniso tef* matures during the rainy season, harvesting and threshing large plots of *tef* is still a challenge, and so farmers do not use it on a larger scale. This calls for intervention from the research system on how to scale up *geniso* and support a community that is moving away from *tef* production, due to the disease.

The results of this study (Chapter 6) reveal that some sources of risk, such as changes in climate variables (e.g. late onset and early cessation of rainfall), cause crop failures and expose family farmers to food insecurity. Farmers tend to use different adaptation strategies such as early-maturing varieties of maize. However, other sources of food insecurity risk, such as risk of high input and low output prices, make using these adaption strategies unaffordable, which means that the governance of food insecurity risk needs a holistic rather than a piecemeal approach. It is therefore recommended to use the systems approach and consider all sources of risk and their dimensions of influence when designing policies and plans in response to food insecurity risk.

The analysis in Chapter 7 reveals that the Ethiopian government and its development partners are taking different measures to reduce the siltation problem at the Gilgel Gibe-I hydroelectricity dam. These measures focus on different soil conservation practices and income generation schemes to improve the livelihoods of family farmers in the GG-I watershed. The coordinated efforts of the different stakeholders through the forum created for this purpose are highly appreciated. However, sustainable solutions to the existing problem need careful identification and a focus on the root causes of very rapid siltation in the reservoir. Accordingly, the current watershed level interventions might overlook the real causes of the problem. The results of this study reveal that one of the root causes of rapid siltation is the landlessness of the project-affected family farming households living in the surroundings of the reservoir. Intensive crop farming in areas surrounding the buffer zone, and cultivation of the buffer zone itself, emanate from serious landlessness. Preventing these landless households from farming the buffer zone has not brought the desired results. It is therefore, recommended to implement participatory spatial planning that leads to participatory governance of the land delineated as the buffer zone. The participatory governance of the buffer zone entails developing land use plans in a way that promotes the sustainable protection against siltation and ensures economic returns for people evicted from the site in a legally binding form.

Analysis of the decision to choose alternative livelihood strategies as family farmers' responses to different sources of food insecurity risk (Chapter 8) reveals that their decisions to choose from among the major livelihood strategies are interdependent. The decision to choose some of the livelihood strategies are complementary to each other. In addition, the choice of combining some livelihood strategies was found to enhance the likelihood of adopting another livelihood strategy. Moreover, some socioeconomic variables and perceptions of certain sources of food insecurity risk were found to increase the likelihood of adopting a certain livelihood strategy while decreasing the likelihood of adopting a certain livelihood strategy. Taking these interdependencies into account, the development of policies and plans to reduce food insecurity needs to consider the complementarity and substitution effects of household decisions to choose different livelihood strategies. It is also crucial to consider the effect of promoting the combination of different livelihood strategies to boost food production, enhance household income, and ultimately ensure household food security. Moreover, results of the analysis in Chapter 8 reveal the fact that the perceptions of family farmers on the risk of drought, crop pests, and increased

input prices enhance the choice of multiple livelihood strategies. This means proper communication and mass awareness of these risks alert family farmers to diversify. It is therefore recommended to focus on the provision of an early warning information system and raise public awareness on the impacts of these sources of risk.

Households that have better social networks (especially those who have more relatives) have a higher likelihood of adopting multiple livelihoods than others. This means that interventions encouraging social networks, e.g. farmers' groups of different types, enhance the probability of adoption of multiple livelihood strategies. On the other hand, older farmers are more likely to choose transfer incomes than other livelihood strategies. This could be due mainly to the lack of physical labor available for production activities and off-farm work. This implies the need to consider social security programs that will take care of old-aged farmers, people with physical disabilities and those who are not able to do physical agricultural work.

References

Abdulai, A., & CroleRees, A. (2001). Determinants of income diversification amongst rural households in Southern Mali. *Food Policy*, *26*(4), 437–452.

Abebe, M. (2009). Emerging trends in disaster management and the Ethiopian experience: genesis, reform and transformation. *Journal of Business and Administrative Studies*, *1*(2), 60–89.

Adams, D. W. (1970). Agricultural Development Strategies in Ethiopia 4c. 1950-1970. Retrieved from http://pdf.usaid.gov/pdf_docs/PNADW072.pdf

Adugna, S. (2014). Efforts made to fight from drought and food insecurity. In *From Poverty to Development: Transfering knowledge to generations* (p. 473). Forum for social studies.

Agrawal, A., Konnen, M., & Perrin, N. (2009). *The Role of Local Institutions in Adaptation to Climate Change* (Working Paper No. 118). Washington D.C.: The World Bank.

Allen Hoben. (1973). Land tenure among the Amhara of Ethiopia: The dynamics of cognatic descent. The University of Chicago Press.

Andersson, C., Mekonnen, A., & Stage, J. (2011). Impacts of the Productive Safety Net Program in Ethiopia on livestock and tree holdings of rural households. *Journal of Development Economics*, *94*(1), 119–126.

Aredo, D. (1990). The Evolution of Rural Development Policies. In *Ethiopia: Rural Development Options* (p. 256). London and New Jersey: Zed Books Ltd.

Aven, T., & Renn, O. (2010). *Risk Management and Governance*. Berlin, Heidelberg: Springer Berlin Heidelberg.

Ayele, Z. (2011). Local government in Ethiopia: still an apparatus of control? *Law, Democracy & Development*, *15*(1).

Ayenew, M. (2007). A Rapid Assessment of *Woreda* Decentralization in Ethiopia. In *Decentralization in Ethiopia*. Addis Ababa.

Babulo, B., Muys, B., Nega, F., Tollens, E., Nyssen, J., Deckers, J., & Mathijs, E. (2008). Household livelihood strategies and forest dependence in the highlands of Tigray, Northern Ethiopia. *Agricultural Systems*, *98*(2), 147–155.

Bahiru, G. (2010). *Environmental Impact Monitoring for gilgel Gibe I Dam Using and Integrated Methods of Remote Sensing and Geographic Information System (GIS)* (Thesis). Addis Ababa University, Addis Ababa. Retrieved from http://etd.aau.edu.et/handle/123456789/795

Baissa, L. (1994). Gada Values: The building Blocks of A Democratic Polity. *The Journal of Oromo Studies*, *1*(2), 47–52.

Bandiera, O., & Rasul, I. (2006). Social networks and technology adoption in northern Mozambique. *The Economic Journal*, *116*(514), 869–902.

Barrett, C. B. (2001). Does Food Aid Stabilize Food Availability? *Economic Development and Cultural Change*, *49*(2), 335–349.

Barrett, C. B., Bezuneh, M., & Aboud, A. (2000). The Response of Income Diversification to Macro and Micro Policy Shocks in Cote d'Ivoire and Kenya. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=257334

Barrett, C. B., Bezuneh, M., & Aboud, A. (2001). Income diversification, poverty traps and policy shocks in Côte d'Ivoire and Kenya. *Food Policy*, *26*(4), 367–384.

Barrett, C. B., Clark, M. B., Clay, D. C., & Reardon, T. (2005). Heterogeneous constraints, incentives and income diversification strategies in rural Africa. *Quarterly Journal of International Agriculture*, *44*(1), 37–60.

Barrett, C. B., & Reardon, T. (2000). Asset, activity, and income diversification among African agriculturalists: Some practical issues. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=257344

Beck, U. (1992). *Risk society: towards a new modernity* (Repr). London: Sage.

Beck, U. (2002). The terrorist threat world risk society revisited. *Theory, Culture & Society*, *19*(4), 39–55.

Beck, U. (2006). Living in the world risk society: A Hobhouse Memorial Public Lecture given on Wednesday 15 February 2006 at the London School of Economics. *Economy and Society*, *35*(3), 329–345.

Beck, U. (2008). World at risk: The new task of critical theory. *Development and Society*, *37*(1), 1–21.

Beck, U., Bonss, W., & Lau, C. (2003). The theory of reflexive modernization problematic, hypotheses and research programme. *Theory, Culture & Society*, *20*(2), 1–33.

Bekele, D. (1982). Peasant Associations and Agrarian Reform in Ethiopia, *13*, 60–65.

Bekele, G. (2002). The Role of the Ethiopian Grain Trade Enterprise in Price Policy. In *The Role of the Ethiopian Grain Trade Enterprise in Price Policy* (pp. 83–91). Addis Ababa.

Belachew, T., Lindstrom, D., Gebremariam, A., Jira, C., Hattori, M. K., Lachat, C., … Kolsteren, P. (2012). Predictors of chronic food insecurity among adolescents in Southwest Ethiopia: a longitudinal study. *BMC Public Health*, *12*(1), 1.

Belderbos, R., Carree, M., Diederen, B., Lokshin, B., & Veugelers, R. (2004). Heterogeneity in R&D cooperation strategies. *International Journal of Industrial Organization*, *22*(8–9), 1237–1263.

Berg, B. L. (2001). *Qualitative research methods for the social sciences* (4. ed). Boston: Allyn and Bacon.

Berman, R. J., Quinn, C. H., & Paavola, J. (2015). Identifying drivers of household coping strategies to multiple climatic hazards in Western Uganda: implications for adapting to future climate change. *Climate and Development*, *7*(1), 71–84.

Besha, D. B., & Park, D.-B. (2014). Ehtiopiam Agricultural Extension System-The Past Experience, Present Status and Future Direction. *Journal of Agricultural Extension & Community Development*, *21*(1), 219–244.

Beunen, R., Van Assche, K., & Duineveld, M. (2015). *Evolutionary governance Theory: Theoory and Applications*. New York Dordrecht London: Springer. Retrieved from www.springer.com

Bewket, W. (2009). *Rainwater Harvesting as a Livelihood Strategy in Drought-prone Areas of Amhara Region of Ethioia*. Addis Ababa: Organization for Social Science Research in Eastern and Southern Africa (OSSREA).

Binder, C. R., & Schöll, R. (2009). Structured Mental Model Approach for Analyzing Perception of Risks to Rural Livelihood in Developing Countries. *Sustainability*, *2*(1), 1–29. https://doi.org/10.3390/su2010001

Binswanger, H. P. (1980). Attitudes toward Risk: Experimental Measurement in Rural India. *American Journal of Agricultural Economics*, *62*(3), 395. https://doi.org/10.2307/1240194

Binswanger, H. P. (1983). Agricultural growth and rural nonfarm activities. *Finance and Development; Washington, D.C.*, *20*(2), 38–40.

Block, S., & Webb, P. (2001). The dynamics of livelihood diversification in post-famine Ethiopia. *Food Policy*, *26*(4), 333–350.

Boes, S., & Winkelmann, R. (2006). Ordered response models. *Allgemeines Statistisches Archiv*, *90*(1), 167–181.

Boin, A., & Fishbacher-Smith, D. (2011). The importance of failure theories in assessing crisis management: The *Columbia* space shuttle disaster revisited. *Policy and Society*, *30*(2), 77–87.

Bradbury, J. A. (1989). The Policy Implications of Differing Concepts of Risk. *Science, Technology & Human Values*, *14*(4), 380–399.

Cohen, J. M. (1987). *Integrated rural development: the Ethiopian experience and the debate*. Uppsala: Scandinavian Institute of African Studies.

CSA. (2005). *Ethiopian national labor force survey: Report on the 2005 national labor force survey* (Survey report No. 365) (p. 380). Addis Ababa: The Federal Democratic Republic of Ethiopia Central Statistical Agency.

CSA. (2016). *Report on Area and production and Farm Management Practices of Belg Season for Private Peasant Households* (Statistical Bulletin No. 578). Addis Ababa: Central Statistical Agenecy of the Federal Democratic Republic of Ethiopia. Retrieved from http://www.csa.gov.et/images/general/news/area_and_crop_production_report_2015_16.pdf

CSA, & WFP. (2014). *Comprehensive Food Security and Vulnerability Analysis (CFSVA)*.

Davis, K., Swanson, B., Amudavi, D., Mekonnen, D. A., Flohrs, A., Riese, J., … others. (2010). In-depth assessment of the public agricultural extension system of Ethiopia and recommendations for improvement. *International Food Policy Research Institute (IFPRI) Discussion Paper* (01041). Retrieved from http://www.academia.edu/download/43000308/ifpridp01041.pdf

Degefe, B., & Tafesse, T. (1990). The Marketing and Pricing of Agricultural Products in Ethiopia. In *Ethiopia: Rural Development Options* (p. 256). London and New Jersey: Zed Books Ltd.

Demeke, M. (2012). *Analysis of incentives and disincentives for maize in Ethiopia*. FAO. Retrieved from https://agriknowledge.org/downloads/th83kz40s

Demeke, M., Guta, F., & Ferede, T. (2004). *Agricultural development in Ethiopia: are there alternatives to food aid?* (p. 76). Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.613.6616&rep=rep1&type=pdf

Demissie, T. A., Saathoff, F., Seleshi, Y., & Gebissa, A. (2013). Evaluating the Effectiveness of Best Management Practices in Gilgel Gibe Basin Watershed-Ethiopia. *Journal of Civil Engineering and Architecture*, *7*(10), 1240.

Dercon, S. (1999). *Ethiopia: Poverty assessment study* (Report for In ternational Fund for Agricultural Development (IFAD)). Retrieved from http://www.academia.edu/download/6839266/ifad1.pdf

Detlef Müller-Mahn and Jonathan Klinke. (2013). Riskscapes: The spacial dimension of risk. In *The Spactial Dimension of Risk: How geography shapes the emergence of riskscapes*. Routledge.

Devereux, S. (Ed.). (2007). *The new famines: why famines persist in an era of globalization*. London ; New York: Routledge, Taylor & Francis Group.

Devi, R., Tesfahune, E., Legesse, W., Deboch, B., & Beyene, A. (2008). Assessment of siltation and nutrient enrichment of Gilgel Gibe dam, Southwest Ethiopia. *Bioresource Technology*, *99*(5), 975–979.

di Falco, S., & Bulte, E. (2011). A Dark Side of Social Capital? Kinship, Consumption, and Savings. *Journal of Development Studies*, *47*(8), 1128–1151.

Dorfman, J. H. (1996). Modeling multiple adoption decisions in a joint framework. *American Journal of Agricultural Economics*, *78*(3), 547–557.

Dorosh, P. A., & Rashid, S. (2012). *Food and Agriculture in Ethiopia: Progress and Policy Changes*. Philadelphia: University of Pennsylvania Press.

Doss, C., McPeak, J., & Barrett, C. B. (2008). Interpersonal, Intertemporal and Spatial Variation in Risk Perceptions: Evidence from East Africa. *World Development*, *36*(8), 1453–1468.

EELPA (Ethiopia Electric Light and Power Authority). (1997). Gilgel Gibe Hydroelectric Project: Environmental Assessment Main Report, 100.

EFDR. (2003). Rural Developmment Poclicy and strategies.

Ellis, F. (1998). Household strategies and rural livelihood diversification. *Journal of Development Studies*, *35*(1), 1–38.

Ellis, F. (2000). The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics*, *51*(2), 289–302.

Ethiopian Electric Power Power Corporation (EEPCO). (2011). Gilgel Gibe Hydroelectric Project – Environmental Management Plan. Retrieved from

https://www.google.de/search?q=Gilgel+Gibe+Hydroelectric+Project+%E2%80%93+Environmental+Management+Plan

Fafchamps, M., & Minten, B. (2002). Returns to social network capital among traders. *Oxford Economics Papers*, *54*(2002), 173–206.

FAO (Ed.). (2014). *Innovation in family farming*. Rome.

Field, C. B., & Intergovernmental Panel on Climate Change (Eds.). (2012). *Managing the risks of extreme events and disasters to advance climate change adaption: special report of the Intergovernmental Panel on Climate Change*. New York, NY: Cambridge University Press.

Filmer, D., & Pritchett, L. (1998). *The effect of household wealth on educational attainment: demographic and health survey evidence*. World Bank Publications.

Food and Agriculture Organization (FAO). (2013). International Year of Family Farming 2014 Master Plan (final version) (30 May 2013). Rome: FAO.

Franzel, S., Colburn, F., & Degu, G. (1989). Grain-marketing-regulations: Impact on peasant production in Ethiopia. *World Development*, *14*(4), 347–358.

Gadgil, S., Rao, P. R. S., & Sridhar, S. (1999). Modelling impact of climate variability on rainfed groundnut. *Current Science*, *76*(4), 557–569.

Gloede, O., Menkhoff, L., & Waibel, H. (2015). Shocks, Individual Risk Attitude, and Vulnerability to Poverty among Rural Households in Thailand and Vietnam. *World Development*, *71*, 54–78.

Greene, W. H. (2008). *Econometri Analysis* (7th ed.). New Jersey: Prentice Hall.

Hadley, C., Belachew, T., Lindstrom, D., & Tessema, F. (2009). The Forgotten Population? Youth, Food Insecurity and Rising Prices: Implications for the Global Food Crisis. *NAPA Bulletin*, *32*(1), 77–91.

Hardaker, J. B. (2000). *Some issues in dealing with risk in agriculture*. Armidale, N.S.W.: University of New England, Graduate School of Agricultural and Resource Economics. Retrieved from http://www.une.edu.au/febl/EconStud/AREwp00-3.PDF

Hassen, M. (1994). *The Oromo of Ethiopia: A History 1570-1860*. The Red Sea Press.

Hassen, M. (2005). Pilgrimage to the Abba Muudaa. *Journal of Oromo Stadies*, *12*(1&2), 142–157.

Hill, R. V., & Porter, C. (2017). Vulnerability to Drought and Food Price Shocks: Evidence from Ethiopia. *World Development*, *96*, 65–77.

Hodgson, G. M. (2006). What Are Institutions? *Journal of Economic Issues*, *40*(1).

Höllinger, F., & Haller, M. (1990). Kinship and social networks in modern societies: a cross-cultural comparison among seven nations. *European Sociological Review*, *6*(2), 103–124.

Holmberg, J. (1977). *Grain marketing and land reform in Ethiopia: An analysis of the marketing and pricing of food grains in 1976 after the land reform.*(Research Report No. 41). Apsala: The Scandinavian Institute of African studies.

Hornidge, A.-K., & Scholtes, F. (2011). Climate Change and Everyday Life in Toineke Village, West Timor: Uncertainties, Knowledge and Adaptation. *Sociologus*, *61*(2), 151–175.

Hurni, H. (1998). Agroecological belts of Ethiopia. *Bern: Centre for Development and Environment, University of Bern in Association with the Ministry of Agriculture, Ethiopia*. Retrieved from http://library.wur.nl/WebQuery/file/isric/fulltext/isricu_t4d384c8b_001.pdf

Hussein, K., & Nelson, J. (1998). Sustainable livelihoods and livelihood diversification. Retrieved from https://opendocs.ids.ac.uk/opendocs/handle/123456789/3387

Isham, J. (2002). The Effect of Socail Capital on Fertilizer Adoption: Evidence from Rural Tanzania. *Journal of African Economics*, *11*(1), 39–60.

Jalata, A. (2012). Gadaa (Oromo democracy): an example of classical African Civilization. *Journal of Pan-African Studies*, 126.

Jean, F. (2008) *From Ethiopia to Chechnya: Reflections on Humanitarian Action 1988–1999.* Fondation Médecins Sans Frontières–Centre de Réflexion sur l'Action et les Savoirs Humanitaires, Paris.

Jemma, H. (2004). The politics of land tenure in Ethiopian history: Experience from the south. In *Proceedings of Eleventh Congress of Rural Sociology*. Trondium, Norway.

Joffe, H. (2012). Thematic Analysis. In *Qualitative Research Methods in Mental Health and Psychotherapy: A Guide for Students and Practitioners* (First, pp. 209–223). Sussex, United Kingdom: Wiley-Blackwell.

Tulu, Z. (2010). *Institutions, Incentives and Conflicts in Coffee Forest Conservation and Use: the Case of Yayo Coffee Forest in Ilu Abba Bora Zone, Southwest Ethiopia*. Doctoral Thesis. University of Bonn.

Kassa, B. (2003). Agricultural extension in Ethiopia: the case of participatory demonstration and training extension system. *Journal of Social Development in Africa*, *18*(1), 49–84.

Kassa, H. (2008). Agricultural Extension in Ethiopia: Historical Evolution, Relevant Policies, and Challenges. In *Digest of Ethiopia's National Policies, Strategies and Programs* (p. 469). Addis Ababa: Forum for Social Studies. Retrieved from www.fssethiopia.org.et

Kassa, K. (2001). *Rerelocation and islocation of Communities by Develpment Projects: The Case of Gilgel Gibe Dam (1962-200) in Jimma Zone,*. Addis Ababa University , School of Graduate Studies, Addis Ababa. Retrieved from http://repository.forcedmigration.org/show_metadata.jsp?pid=fmo:2901

Kehler, A. (2004). When will Ethiopia stop requesting food aid? In *Humanitarian Exchange* (pp. 22–26). Humanitarian Practice Network. Retrieved from http://odihpn.org/magazine/when-will-ethiopia-stop-asking-for-food-aid/

Kelemework, F., & Kassa, H. (2006). *Assessment of the current extension system of Ethiopia: A closer look at planning and implementation*. Ethiopian Economic Association/Ethiopian Economic Policy Research Institute (EEA/EEPRI).

Khanna, M. (2001). Sequential adoption of site-specific technologies and its implications for nitrogen productivity: A double selectivity model. *American Journal of Agricultural Economics*, *83*(1), 35–51.

Knowles, C. J., & Anker, R. (1981). Ana Analysis of Income Transfers in a Developing Country: Thge Case of Kenya. *Journal of Development Economics*, *8*, 205–226.

Krueger, R. A. (1994). *Focus Groups: A Practical Guide for Applied Research* (second). Thousand Oaks, CA: Sage.

Kuma, T. (2002). Trends in agricultural production, technology dissemination, and price movements of outputs and inputs. Ethiopian Development Research Institute and International Food Policy Research Institutute, 35.

Langyintuo, A. S., Mungoma, C., & others. (2006). The Effect of Household Wealth on Input Market Participation in Southern Africa. In *2006 Annual Meeting, August 12-18, 2006, Queensland, Australia*. International Association of Agricultural Economists. Retrieved from http://www.academia.edu/download/43920306/cp061119.pdf

Lautze, S., & Maxwell, D. (2007). Why famines persist in the Horn of Africa? Ethiopia, 1999-2003. In *The New Famines: Why famines persist in an era of globalization* (pp. 222–245). New York: Routledge.

Legese, G., S. Langyintuo, A., Mwangi, W., & Jaleta, M. (2011). Determinants of Adoption of Improved Drought Tolerant Maize Varieties and their Implication for Household Food Security in Drought Prone Areas. *Ethiopian Journal of Agricultural Economics*, *8*(1), 105–132.

Legesse, A. (1973). *Gada: Three Approaches to the Study of African Society*. New York: The Free Press A Division of Macmillan Publishing Co., Inc.

Legesse, A. (2000). *Oromo Democracy: An Indigenous African Political System*. The Red Sea Press.

Lewis, H. S. (1974). Neighbors, Friends, and Kinsmen: Principles of Social Organization among the Cushitic-Speaking Peoples of Ethiopia. *Ethnology*, *13*(2), 145.

Luhman, N. (1984). *Social Systems*. Stanford, California: Stanford University Press.

Luhmann, N. (1995). *Social systems*. Stanford University Press.

Marco, B. (2005). *Decisions in The Shade: Political and Juridical Processes Among the Oromo Borana*. New Jersey, USA: The Red Sea Press.

Marenya, P. P., & Barrett, C. B. (2007). Household-level determinants of adoption of improved natural resources management practices among smallholder farmers in western Kenya. *Food Policy*, *32*(4), 515–536.

Markussen, T., & Tarp, F. (2014). Political connections and land-related investment in rural Vietnam. *Journal of Development Economics*, *110*, 291–302.

Maxwell, S., & Frankenberger, T. R. (1992). *Household Food Security: Concepts, Indicators, Measurements*. New York, NY: UNICEF Programme Publications.

McDaniels, T., Axelrod, L. J., & Slovic, P. (1995). Characterizing perception of ecological risk. *Risk Analysis*, *15*(5), 575–588.

Megerssa, G. (1993). *Knowledge, Identity and The Colonizing Structure: The case of The Oromo in East and Northeast Africa*. PhD Thesis Submitted to Department of Anthropology University of London School of Oriental and African Studies, London.

Mengisteab, K. (1990). *Ethiopia: Failure of Land Reform and Agricultural Crisis*. United States of America.

Miller, C. M., Tsoka, M., & Reichert, K. (2011). The impact of the Social Cash Transfer Scheme on food security in Malawi. *Food Policy*, *36*(2), 230–238. https://doi.org/10.1016/j.foodpol.2010.11.020

Minot, N., & Sawyer, B. (2013). Agricultural Prodiction in Ethiopia: Results of the 2012 ATA Baseline Survey. Washington, D.C.: International Food Policy Research Institute.

MOA(Ministry of Agriculutre). (2010). Participatory Agricultural Extension System.

MoANR. (2017). Ethiopia's Agricultural Extension Strategy: Visions, Systemic bottlenecks and Priority Interventions.

MOARD (Ministry of Agriculture and Rural Development). (2009). Food Security Program 2010-2014.

Müller-Mahn, D., & Everts, J. (2013). Riskscapes: The Spatial Dimension of Risk. In *The Spatial Dimension of Risk: How Geography Shapes the Emergence of Riskscapes*. Routledge.

National Disaster Risk Management commission (NDRMC). (2015, January). Food supply prospects for the year 2016.

NDRMC. (2015, January). Food supply prospects for the year 2016. National Disaster Risk Management commission. Addis Ababa, Ethiopia

Negin, J., Remans, R., Karuti, S., & Fanzo, J. C. (2009). Integrating a broader notion of food security and gender empowerment into the African Green Revolution. *Food Security*, *1*(3), 351–360. https://doi.org/10.1007/s12571-009-0025-z

North, D. C. (2005). *Understanding the Process of Economic Change*. New Jersey, USA: Princeton University Press.

North, D. C. (1991). Institutions. *The Journal of Economic Perspectives*, *5*(1), 97–112.

Norton, A., & Foster, M. (2001). *The potential of using sustainable livelihoods approaches in poverty reduction strategy papers*. London: Overseas Development Institute.

Nye, J. S., & Donahue, J. D. (Eds.). (2000). *Governance in a globalizing world*. Cambridge, Mass: Visions of Governance for the 21st Century [u.a.].

Onwuegbuzie, A. J., Dickinson, W. B., Leech, N. L., & Zoran, A. G. (2009). A qualitative framework for collecting and analyzing data in focus group research. *International Journal of Qualitative Methods*, *8*(3), 1–21.

Ostrom, E., Gardner, R., & Walker, J. (1994). *Rules, Games, and Common-Pool Resources*. USA: Ann Arbor: The University of Mitchigan Press.

Pankhurst, A. (1990). Resettlement: Policy and Practice. In *Ethiopia: Rural Development Options* (pp. 121–134). New Jersey, USA: Zed Books Ltd.

Pankhurst, A., & Damen Haile Mariam. (2000). The Iddir in Ethiopia: Historical Development, Social Function, and Potential Role in HIV/AIDS Prevention and Control. *Northeast African Studies*, *7*(2), 35–57.

Pankhurst, A., & Rahmato, D. (2013). Food Security, Safety Nets and Social Protection in Ethiopia. In *Food Security, Safety Net and Social Protection in Etiopia* (p. 9). Addis Ababa: Forum for Social Studies.

Quiñones, M. A., Borlaug, N. E., & Dowswell, C. R. (1997). A fertilizer-based green revolution for Africa. *Replenishing Soil Fertility in Africa* (replenishingsoi), 81–95.

Quisumbing, A. R. (Ed.). (2003). *Household decisions, gender, and development: a synthesis of recent research*. Washington, DC: International Food Policy Research Institute.

Rahmato, D. (1984). *Agrarian reform in Ethiopia*. Stockholm: Almqvist & Wiksell Internat.

Rahmato, D. (1991). *Famine and survival strategies: a case study from Northeast Ethiopia*. Uppsala: Nordiska Afrikainst.

Rahmato, D. (1994). Land policy in Ethiopia at the crossroads, paper presented at the Workshop on "Land Tenure and Land Policy." Addis Ababa University.

Rahmato, D. (2004). Searching for tenure security?: the land system and new policy initiatives in Ethiopia. Forum for Social Studies.

Rahmato, D. (2008). Ethiopia: Agricutural Polcity review. In *Digest of Ethiopia's National Policies, Srategies and Programs* (p. 469). Forum for Social Studies. Retrieved from www.fssethiopia.org.et

Rahmato, D. (2009). *The peasant and the state: Studies in agrarian change in Ethiopia 1950s - 2000s*. Addis Ababa: Addis Ababa University press.

Rahmato, D. (2011). *Land to investors: Large-scale land transfers in Ethiopia*. Addis Ababa: Forum for Social Studies.

Rashid, S., Assefa, M., & Ayele, G. (2007). *Distortions to Agricultural Incentives in Ethiopia* (Working Paper No. 43) (p. 46). Addis Ababa: International Food Policy Research Institute.

Rashid, S., & Dorosh, P. (2009). The interplay of public policy and grain market behavior in Ethiopia. *Center for African Studies, Oxford University. Http://Users. Ox. Ac. Uk/~ Econstd/Brief_SRashid_v2. Pdf*. Retrieved from https://www.researchgate.net/profile/Shahidur_Rashid/publication/281638798_The_Interplay_of_Public_Policy_and_Grain_Market_Behavior_in_Ethiopia/links/55f1a7dc08aef559dc48ad99.pdf

Rashid, S., Getnet, K., & Lemma, S. (2010). Maize value chain potential in Ethiopia. *Constraints and Opportunities for Enhancing the System. Washington, DC: International Food Policy Research Institute*. Retrieved from https://www.researchgate.net/profile/Shahidur_Rashid/publication/282729771_Maize_Value_Chain_Potential_in_Ethiopia_Constraints_and_opportunities_for_enhancing_the_system/links/561a03ed08ae044edbafaabc.pdf

Rashid, S., Negassa, A., (2011). Policies and performnce of Ethiopian cereal markets. (Working paper 21). *Ethiopia Strategy Support Program II*, Retrieved from https://www.researchgate.net/profile/Shahidur_Rashid/publication/265231361_Policies_and_Performance_of_Ethiopian_Cereal_Markets/links/55d91e3608aed6a199a89a9d.pdf

Rashid, S., & Negassa, A. (2012). Cereal Markets. *Food and Agriculture in Ethiopia: Progress and Policy Challenges*, *74*, 123.

Reardon, T., Delgado, C., & Matlon, P. (1992). Determinants and effects of income diversification amongst farm households in Burkina Faso. *Journal of Development Studies*, *28*(2), 264–296.

Renn, O. (1996). Concepts of Risk"A Classifiacation. In *Social Theories of Risk* (3rd ed., Vol. 15, pp. 53–79).

Renn, O. (2008). *Risk governance: coping with uncertainty in a complex world*. London: Earthscan.

Renn, O. (2009). *White Paper on risk governance: Towards and integrative approach*. International Risk Governance Council (IRGC). Retrieved from http://lib.riskreductionafrica.org/handle/123456789/638

Ritchie, J., Lewis, J., Nicholls, C. M. N., & Ormston, R. (2003). *Qualitative Reseearch Practice: A Guide for Social Science Students and Researchers* (First). London: SAGE.

Sabates-Wheeler, R., & Devereux, S. (2010). Cash transfers and high food prices: Explaining outcomes on Ethiopia's Productive Safety Net Programme. *Food Policy*, *35*(4), 274–285.

Salama, P., Assefa, F., Talley, L., Spiegel, P., van der Veen, A., & Gotway, C. A. (2001). Malnutrition, measles, mortality, and the humanitarian response during a famine in Ethiopia. *Jama*, *286*(5), 563–571.

Sauerborn, R., Adams, A., & Hien, M. (1996). Household strategies to cope with the economic costs of illness. *Social Science & Medicine*, *43*(3), 291–301.

Scoones, I. (1998). *Sustainable Rural Livelihoods A Framework for Analysis*. Institute of Development Studies.

Sen, A. (1981). *Poverty and famines: an essay on entitlement and deprivation*. Oxford : New York: Clarendon Press ; Oxford University Press.

Shiferaw, A. (2014). The beggining of economic planning in Ethiopia. In *From Povery to Development: Transfering knowledge to generation* (p. 473). Addis Ababa: Forum for Social Studies.

Siegel, P. B., & Alwang, J. (1999). *An Asset-Based Approach to Social Risk Management: A Conceptual Framework*.

Sjöberg, L., Moen, B.-E., & Rundmo, T. (2004). Explaining risk perception. *An Evaluation of the Psychometric Paradigm in Risk Perception Research*, *10*(2), 665–612.

Smith, D. R., Gordon, A., Meadows, K., & Zwick, K. (2001). Livelihood diversification in Uganda: patterns and determinants of change across two rural districts. *Food Policy*, *26*(4), 421–435.

Spielman, D. J., Kelemework, D., & Alemu, D. (2009). Policies to promote smallholder intensification in Ethiopia: The search for appropriate public and private roles. In *7th International Conference on the Ethiopian Economy, June* (pp. 25–27).

Stahl, M. (1974). *Ethiopia: Political contradictions in agricultural development*. Acta, Stockholm.

Steeven Franzel, Forrest Colburn and Getahun Degu. (1989). Grain-marketing-regulations--Impact-on-peasant-production-in-Ethiopia. *Food Policy*, *14*(4), 347–358.

Stellmacher, T. (2007). The historical development of local forest governance in Ethiopia: From imperial times to the military regime of the Derg. *Africa Spectrum*, 42(3), 519–530.

Stellmacher T. & P. P. Mollinga (2009). The institutional sphere of coffee forest management in Ethiopia: Local level findings from Koma forest, Kaffa Zone. In: International Journal of Social Forestry 2(1): 43-66.

Stellmacher, T. & R. Nolten (2010): Forest Resource Use and Local Decision Making in the Bale Mountains Coffee Forests, Ethiopia. In: I. Eguavoen & W. Laube (eds.): Negotiating Local Governance. Natural Resources Management at the Interface of Communities and the State, Lit Publishing, Berlin.

Stellmacher, T. (2013). Local forest governance in Ethiopia: Between legal pluralism and livelihood realities. ZEF Working Paper 110, Bonn.

Stellmacher, T. (2015). *Socioecological Change in Rural Ethiopia: Understanding Local Dynamics in Environmental Planning and Natural Resources Management*. Frankfurt: Peter Lang.

Stommes, E., & Sisaye, S. (1979). The administration of agricultural development programmes: A look at the Ethiopian approach—Part 1. *Agricultural Administration*, *6*(3), 221–239.

Suess-Reyes, J., & Fuetsch, E. (2016). The future of family farming: A literature review on innovative, sustainable and succession-oriented strategies. *Journal of Rural Studies*, *47*, 117–140.

Sulewski, P., & Kłoczko-Gajewska, A. (2014). Farmers' risk perception, risk aversion and strategies to cope with production risk: an empirical study from Poland. *Studies in Agricultural Economics*, *116*(3), 140–147.

Taffesse, A. S., Dorosh, P., & Gemessa, S. A. (2012). Crop production in Ethiopia: Regional Patterns and Trends. In *Food and Agricultue in Ethiopia: Progress and Policy Challenges*. Philadelphia: University of Pennsylvania Press. Retrieved from www.upenn.edu/pennpress

Tecle, T. (1971). *Rural development programs in Ethiopia: A review of the Chilalo Agricultural Development Unit, the Wolamo Agricultural Development Unit and the Minimum Package Program*. Backgound paper, Washington DC.

Tecle, T. (1975). The Evolution of Alternative Rural Development Strategies in Ethiopia; Implications for Employment and Income Distribution (12). Retrieved from http://eric.ed.gov/?id=ED116842

Tefera, B., & Sterk, G. (2008). Hydropower-Induced Land Use Change in Fincha'a Watershed, Western Ethiopia: Analysis and Impacts. *Mountain Research and Development*, *28*(1), 72–80.

Teferi, A., & others. (1992). Food Grain Marketing Reform in Ethiopia. In *Issues in agricultural development: sustainability and cooperation. 21st International Conference of Agricultural Economists, held in Tokyo, Japan, on 22-29 August 1991.* (pp. 275–282).

Retrieved from http://ageconsearch.umn.edu/bitstream/197887/2/agecon-occpapers-1992-037%5B1%5D.pdf

Teklu, N., & Kassa, M. (2011). *Proceeding of the National Workshop on Integrated Watershed Management on Gibe-Omo Basin*. PHE-Ethiopia.

The Provisional Militrary Government of Ethiopia. (1976, November 20). A Proclamation to Provide for the Establishement of an Agricultural Marketing Corporation. *Negarit Gareta*, p. 7.

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*, *8*(1), 45.

Thompson, A. R., & Chambers, E. (2012). Ethical Issues in Qualitative Mental Health Research. In *Qualitative Reseach Methods in Mental Health and Psychotherapy: A Guide for Students and Practitioners* (First, pp. 23–40). Wiley-Blackwell.

Toli, T. T., & Boland, H. (2006). *Coffee forest conservation: local-level institutions influencing the conservation and use of coffee forests in Southwest Ethiopia*. Weikersheim: Margraf.

Transitional Government of Ethiopia (TGE). (1993). National policy on Disaster prevention and Management. Retrieved from http://www.ifrc.org/Docs/idrl/N419EN.pdf

Tridico, P. (2004). *Institutional change and economic performance in transition economics: the case of Poland*. Sussex European Institute. Retrieved from http://www.sussex.ac.uk/sei/documents/sei-working-paper-no-74.pdf

Van Assche, K., & Djanibekov, N. (2012). Spatial planning as policy integration: The need for an evolutionary perspective. Lessons from Uzbekistan. Land Use Policy, 29(1), 179-186.

Van Assche, K., Beunen, R., & Duineveld, M. (2013). Evolutionary Governance Theory: An Introduction. New York Dordrecht London: Springer. Retrieved from www.springer.com

Van Assche, K., Beunen, R., & Duineveld, M. (2014). Formal/informal dialectics and the self-transformation of spatial planning systems: an exploration. Administration & Society, 46(6), 654–683.

Van Assche, K., & Hornidge, A.-K. (2015). Rural Development: Knowledge and Expertise in Governance. The Netherlands: Wageningen Academic Publishers.

Van Assche, K., Beunen, R., Duineveld, M., & Gruezmacher, M. (2017a). Power/knowledge and natural resource management: Foucaultian foundations in the analysis of adaptive governance. Journal of Environmental Policy & Planning, 19(3), 308-322.

Van Assche, K., Deacon, L., Gruezmacher, M., Summers, R., Lavoie, S., Jones, K., & Parkins, J. (2017b). Boom & Bust. Local strategy for big events. A community survival guide to turbulent times. Groningen/Edmonton, Alberta: In Planning and University of Alberta, Faculty of Extension.

Van Uffelen, J.-G. (2013). From Disaster Response to Predictable Food Security Interventions: Structural Change or Structural Reproduction? In *Food Securirity, Safety Bets and Social Protection in Ethiopia* (pp. 113–147). Addis Ababa: Forum for Social Studies.

Von Braun, J., & Olofinbiyi, T. (2007). Famine and Food Insecurity in Ethiopia. In *Food Policy for Developing Countries: Case Studies* (p. 12). Cornel University Division of Nutritional Sciences. Retrieved from URL: http://cip.cornell.edu/dns.gfs/1200428184

Von Braun, J., & Olofinbiyi, T. (2009). Famine and Food Insecurity in Ethiopia. *Case Studies in Food Policy for Developing Countries: Domestic Policies for Markets, Production, and Environment*, *2*, 175.

Wakeyo, M., & Lanos, B. (2015). *Analysis of price incentives for maize.pdf*. FAO.

Webb, P., & Von Braun, J. (1994). *Famine and food security in Ethiopia: Lessons for Africa*. New York . Brisbane . Toronto. Singapore: John Wiley and Sons.

Weldegebriel, D. (2012). Land right in Ethiopia: Ownership, equity, and liberty in land use rights.

Wik *, M., Aragie Kebede, T., Bergland, O., & Holden, S. T. (2004). On the measurement of risk aversion from experimental data. *Applied Economics*, *36*(21), 2443–2451.

Winters, P., Corral, L., Gordillo, G., & others. (2001). *Rural livelihood strategies and social capital in Latin America: Implications for rural development projects*. University of New England, Graduate School of Agricultural and Resource Economics. Retrieved from https://www.researchgate.net/profile/Paul_Winters4/publication/23519528_Rural_Livelihood_Strategies_and_Social_Capital_in_Latin_America_Implications_for_Rural_Development_Projects/links/5683130008ae051f9aee9139.pdf

Woldenhanna, T., & Oskam, A. (2001). Income diversification and entry barriers: evidence from the Tigray region of northern Ethiopia. *Food Policy*, *26*(4), 351–365.

Wolfe, W. S., & Frongillo, E. A. (2001). Building household food-security measurement tools from the ground up. *Food and Nutrition Bulletin*, *22*(1), 5–12.

World Bank. (1997). *Proect Appraisal Document: Federal Democratic Republic of Ethiopia Energy II project* (p. 55). Washington DC.

World Bank. (1999). *Ethiopia: Resettlement project report* (No. 141) (p. 5). Washington DC. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/9860/549890BRI0Box31410Aug0199901PUBLIC1.pdf?sequence=1&isAllowed=y

World Bank (Ed.). (2000). *Attacking poverty* (1. print). New York: Oxford Univ. Press.

World Bank. (2006). Implementation Completion Report (IDA-30190 PPFI-P9880) On Credit in the Amount of US$200 Million to the Federal Democratic Republic of Ethiopia for and Energy II Project. Retrieved from http://documents.worldbank.org/curated/en/207421468256151107/pdf/355730rev0pdf.pdf

World Bank. (2007). *Ethiopia: Project completion report* (No. 135) (p. 3). Washington, DC: World Bank. Retrieved from http://documents.worldbank.org/curated/en/473381468281706865/pdf/396040ET0Second0energy0infob13501PUBLIC1.pdf

Zeller, M., Sharma, M., Henry, C., Lapenu, C., & others. (2003). An operational method for assessing the poverty outreach performance of development projects: Results from four

case studies in Africa, Asia and Latin America. In *Proceedings of the 25th International Conference of Agricultural Economists (IAAE)* (pp. 16–22). Citeseer. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.669.5361&rep=rep1&type=pdf

Zewde, B. (1991). *A History of Modern Ethiopia 1855-1991* (Second Edition). Addis Ababa: James Curret Ltd.

Zinn, J. O. (Ed.). (2008). *Social theories of risk and uncertainty: an introduction*. Malden, Mass.: Blackwell. Retrieved from http://en.bookfi.net/book/704305

Annex 1: A chronology of food shortages and famine in Ethiopia

Date	Region Affected	Attributed causes and severity
253-242 BC	Ethiopia	Deduced from low Nile floods
1066-1072	Ethiopia and Egypt	Deduced from low Nile and Egyptian famine
1131-1145	Ethiopia	Severity unrecorded
1252	Ethiopia	First of seven famine years during next 30 years
1258-1259	Ethiopia	Severity unrecorded
1272-1275	Ethiopia	Severity unrecorded
1314-1344	Ethiopia	Severity unrecorded
1435-1436	Ethiopia	Severity unrecorded
1454-1468	Ethiopia	Severity unrecorded
1543-1562	Ethiopia	Attribute to God's anger at murder of Emperor Gelawdewos
1618	North Ethiopia	Emperor forced to evacuate headquarters
1772-1774	Ethiopia	Wide spread human suffering
1796	North Ethiopia	Famine triggered by locust invasion
1800	Ethiopia	Large human and livestock death toll
1812-1816	Tigray	Severity unrecorded
1826-1827	Ethiopia	Failure of cotton and grain crops
1828-1829	Shewa	Much human mortality
1831	Tigray	Severity unrecorded
1835-1838	Tigray and Eritrea	Drought, cholera epidemic; high human and cattle loss
1864-1866	Tigray and Gondar	Heavy human death toll
1876-1878	Tigray and Awash Valley	Heavy livestock death toll
1880	Tigray and Gondar	Much loss of livestock
1888-1892	Ethiopia	Drought and spread of rinderpest caused loss of 90 percent cattle and one-third human population
1895-1896	Ethiopia	Minor drought. Loss of livestock and human lives
1899-1900	Ethiopia	Drought deduced from levels of Lake Rudolf and low Nile floods
1913-1914	North Ethiopia	Lowest Nile floods since 1695. Grain prices said to have risen thirty fold
1920-1922	Ethiopia	Moderate drought, similar to 1895-1896
1932-1934	Ethiopia	Deduced from low level of Lake Rudolf in Northern Kenya
1953	Tigray and Wollo	Severity unrecorded

1957-1958	Tigray and Wollo	Rain failure in 1957 with locusts and epidemic in 1958 Complete failure of rain; no more than 10 rainy days in 1957; accompanied by outbreak of locusts and epidemics; about one million people affected in Tigray alone; some 100,000 people died
1962-1963	Western Ethiopia	Very severe
1964-1965	Ethiopia as a whole	About 25 percent of the *Awraja* in the country were under famine
1965-1966	Wollo, Tigray and south central and western parts	Rain failed in five of the eight *Awrajas* of Tigray, and eight of the 12 *Awrajas* of Wollo
1969	Eritrea	Estimated 1.7 million people suffering food shortage
1971-1973	Northern. Southern and eastern Parts; particularly Wollo and Tigray	Below average rainfall throughout the country; about 400,000 to one million people affected in Tigray alone, and more than 100,000 in Wollo. Some 200,000people died in Tigray, Wollo and northern Shewa; roughly 80 percent of cattle, 50 percent of sheep and 30 percent of goats perished; 55 percent of *Awrajas* in the country under famine in 1973
1971-1975	Ethiopia	Sequence of rain failures. Estimated 0.25 million dead. Fifty percent of livestock lost in Tigray and Wollo
1975-1976	Wollo and Tigray region	Below average *kiremt* rains in Wollo and Tigray; 2-3 million people affected in total; about 52 percent of *Awrajas* in the country under famine in 1975
1978-1979	Southern Ethiopia	*Belg* rains failed; below average *kiremt* rains throughout the country; about 4.3 million and 4.5 million people were affected in 1978 and 1979, respectively
1982	Northern Ethiopia	Below average rainfall; delay onset of *kiremt* rains; about 3.5 million people affected
1983-1985	Most parts of Ethiopia	Complete failure of *belg* rains; below average *kiremt* rains; about 7.9 million people affected
1987	Northern Ethiopia; Most of Shewa; most of Hararghe and the Rift Valley region	Below average rainfall throughout the country; delayed *kiremt* rains; total crop failure in Tigray

1987-1988	Ethiopia	Drought of undocumented severity in peripheral regions
1990-1992	Northern, eastern, and southwestern Ethiopia	Rain failure and regional conflicts. Estimated 4 million people suffering food shortage
1993-1994	Tigray, Wollo, Addis	4 million people requiring food assistance, including demobilized army and Somali refugees. New droughts
1999-2000	Somali Region	Drought overlapped with Ethiopia-Eritrea war 72,000 to 123,000 lives lost in Somali region
2002-2003	Ethiopia	Late onset of rainfall caused crop failure and over 13 million people were in need of food aid
2011	Afar and Somali regions	4.6 million people were in need of food aid
2015-2016	North, northeast and eastern parts of Ethiopia including all the pastoral areas	El Nino induced drought caused about 10.2 million people in need of food aid

Source: Webb & Von Braun (1994); Bewket (2009); and own compilation