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AGRICULTURAL TRANSFORMATION IN ETHIOPIA

State Policy
and Smallholder
Farming

ATAKILTE BEYENE



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Agricultural Transformation in Ethiopia

State Policy and Smallholder Farming

edited by Atakilte Beyene

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Note on reference citations of Ethiopian authors

In accordance with the Standardization of Ethiopian Names in the Scientific Literature, Ethiopian authors are indicated by their first name in the text. In the reference list, both the first and second names are indicated. This is unless the citation style is specified or indicated otherwise in the source material used, in which case the source is cited as specified.

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List of Abbreviations

ADLI	agricultural development-led industrialization
AISE	Agricultural Inputs Supply Enterprise
ATVET	agricultural technical and vocational education and training
BoA	Bureau of Agriculture
BoARD	Bureau of Agriculture and Rural Development
BoIA	Bureau of Irrigation Agency
BoT	Bureau of Trade
BoWR	Bureau of Water Resources
CA	conservation agriculture
CSA	Central Statistical Agency of Ethiopia
CT	conservation tillage
DSA	Development Studies Associates
EBA	enabling the business of agriculture
EEA	Ethiopian Economic Association
EEPRI	Ethiopian Economy Policy Research Institute
EIA	Ethiopian Investment Agency
EIAR	Ethiopian Institute of Agricultural Research
EPRDF	Ethiopian People's Revolutionary Democratic Front
ESE	Ethiopian Seed Enterprise
FAO	Food and Agriculture Organization
FDI	foreign direct investment
FDRE	Federal Democratic Republic of Ethiopia
GDP	gross domestic product
GHG	greenhouse gas
GTP	Growth and Transformation Plan
IMT	irrigation management transfer
IWMI	International Water Management Institute
LSB-ISSD	local seed business-integrated seed sector development
MoA	Ministry of Agriculture
MoANR	Ministry of Agriculture and Natural Resources
MoARD	Ministry of Agriculture and Rural Development
MoFED	Ministry of Finance and Economic Development
MoWR	Ministry of Water Resources
NARS	National Agricultural Research Systems
NT	no tillage

OoA	Office of Agriculture
PADETES	Participatory Demonstration and Training Extension System
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
RAI	responsible agricultural investment
RARIs	regional agricultural research institutes
RLAUP	Rural Land Administration and Use Proclamation
RSEs	regional seed enterprises
SDPRP	Sustainable Development and Poverty Reduction Programme
SRSE	Southern Region Seed Enterprise
TVET	technical vocational education and training
WAT	willingness to pay
WUA	Water User Associations

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State policies and questions of agrarian transformation

Atakilte Beyene

Introduction

The centrality of smallholder agriculture to the current policies of economic transformation in Ethiopia and other similar contexts is critical for many reasons. First, about 80 per cent of the population live in rural areas and depend to varying degrees on agricultural activities (GoE 2011). This indicates the significance of the sector for the employment and food security of rural people and the country at large. Second, it is the dominant form of land use. In 2014/15 the country had 15.5 million smallholder agricultural households operating 17.7 million hectares of land (CSA 2014b). The smallholder farms accounted for about 96 per cent of the total cultivated area while the rest was cultivated by large commercial farms (ibid.). Third, in terms of output, the smallholder accounts for 95 per cent of total agricultural production in Ethiopia (MoANR 2016). In 2014/15 three-quarters of the land worked by the smallholder households was under temporary crops (cereals, pulses, oilseeds and vegetables), spread over about 14.5 million households (CSA 2014b). Cereals are the most important in terms of volume, accounting for 54 per cent of the total production, while maize, wheat and *teff* combined accounted for 77 per cent of all cereal production (CSA 2015a).¹ Livestock production is also an integral part of smallholder agriculture. According to the CSA there were an estimated 57 million cattle, 29 million sheep, 29 million goats, 57 million poultry birds and 11 million equines – among which 1.16 million are camels (this is excluding the livestock population in pastoral (nomadic) areas of Afar and Somali regions) (CSA 2015b).

Finally, smallholder agriculture is a key arena for policy as well as the politics of the country. Questions of development of the rural and the smallholder sectors have never been apolitical in Ethiopian politics. Political discourse on stability, security and ideology of governments has deep rural markers, including rights and distribution of land resources.

In the last fifteen years, Ethiopia has been recognized as one of the fast-emerging economies in Africa, registering high economic growth (Radelet 2010; AfDB 2016). According to official data, real gross domestic product (GDP) growth averaged 10.9 per cent in 2004–14 (World Bank 2016). As a

non-extractive (i.e. without oil or a huge mining sector) economy, Ethiopia's impressive economic growth has been driven by broad-based and successive economic reforms. This phenomenal growth is to a large extent agriculture-based (Fantu et al. 2017), in addition to the services and construction sectors (Moller and Wacker 2017). Private and public investments in land/water/agriculture, infrastructure, urbanization and industrialization are emerging as crucial dimensions of the overall change processes (Verhoeven 2015; Giannecchini and Taylor 2018; Vandercasteelen et al. 2017). These positive changes have given rise to a lot of optimism about the country's prospects for finally leaving underdevelopment and poverty behind. Nevertheless, whether the economic growth registered is accompanied by structural change across key economic sectors is an important research question (Clapham 2017; Bond 2017; Rodrik 2016; Oneiwu 2015).

This book examines the achievements, prospects and problems in transforming smallholder agriculture in Ethiopia. This historical and contextual analysis of smallholder agriculture explores the persistence of structural features as smallholders continue to operate in conditions where access to farm resources is constrained. Smallholder agriculture farm input, output and marketing systems are examined. The role of the state/public in provision of services has been important, but the continued domination of the state and the limited participation of other actors in the system are major structural constraints.

The book also takes a political perspective on the current narratives of agricultural development pursued by the government. Ethiopia's agricultural policies have maintained parallel, at times contradicting, perspectives on agricultural development: one for smallholder and one for large-scale agriculture. Historically, modernization of agriculture has been the perspective adopted; and policies tended to favour large-scale agriculture. The relative focus given to each system has been shifting. The current trend is that while a more pro-poor- and subsistent-oriented policy framing is adopted for smallholders, the policy for large-scale agriculture is framed according to modernization perspectives, where rapid technological and economic changes are believed to be more readily attainable than for smallholder agriculture. The latter perspective has been prominent in the country since 2008. However, this policy discourse has its own challenges. Ethiopia's policy assumptions and expectations about large-scale agriculture have not been met. Furthermore, large-scale commercial farms appear to have created a context of increasing competition for land with good access to water, urban markets, infrastructure and services.

Ethiopia as a country is hugely dependent on agriculture and forests, where rural land and labour are key economic growth factors. While this is well recognized, whether and how smallholder agriculture relates to large-scale commercial farms has become a complex issue. Therefore, for a sustainable,

equitable and just economic transition, agriculture and the rural areas must be an integral and functional part of the economic growth. In this regard, commercialization of the smallholder sector is seen as an important pathway. The book explores the potentials and limitations of such an approach using case studies.

Improving the production conditions of the smallholder sector in order to reduce vulnerability to climate change is an important policy perspective in Ethiopia. Cases of such approaches, addressed in this book, include the introduction of large-scale irrigation schemes and conservation agriculture. The approaches adopted in both cases are interesting. While the first involves a more centralized approach, where the state plays a leading role in constructing massive dam and irrigation schemes, the second is based on the willingness of farmers to accept new technology. The implications of such approaches in terms of how smallholders organize themselves and the potentials of and limitations to change in agricultural practices are addressed.

The book also explores the implications and significance of cultural norms and institutional conditions for agricultural transformation. Smallholders and their farms are often seen as simply resources of crops and livestock or means of livelihoods. This is both reductionist and a simplification. The book conceives smallholders as cultural hubs. For many farmers, farming itself is deeply embedded in their values and traditions. These are explored through food value systems. Other similar dimensions, such as rural health issues, are also crucial for smallholder agriculture. More than anything else, the status of the health of rural households determines the vulnerability of Ethiopian smallholder agriculture.

Smallholder farmers are dynamic, but they also face challenges around production relationships. Systemic exploitative production relations among rural households are reported. Gendered norms around farming activities limit the ability of many women to fulfil their potential. Titling and certification of land rights are commonly conceived as important policy instruments to mitigate such challenges. Nevertheless, such efforts alone do not fully address deep-rooted cultural norms. Progress in civil codes (on marriage, divorce and death) and the existence of functioning legal systems play more of a role in influencing the land right norms and land relations of smallholders.

Finally, urbanization and densification of settlement and infrastructure are presenting not only opportunities (in terms of rising demands for smallholders' produce), but also risks. The need to improve environmental justice and protection of land and other property rights has become critical, especially in peri-urban areas. In many peri-urban areas, land expropriation, displacement and poor integration of displaced people are major sources of conflict and instability. Political and other land acquisition mechanisms seem to nurture a rent-seeking economy in the informal land markets. As a result, in some

parts of the country, urban expansions face stiff resistance from the periphery. Yet urbanization has potential opportunities to transform the rural. Urban demands for agricultural products may improve the use and management of natural resources, including productivity of agriculture, in the hinterlands. The book highlights the major achievements and limitations of the country's land policies; and it provides policy-relevant recommendations.

Socio-technical perspectives of smallholder agriculture

Ethiopia's smallholder agriculture, which commonly refers to sedentary, ox-plough-based and mixed agriculture, where a farm is typically operated by a household and its members, combines a variety of crops and domestic animals, and has captured the interest of historians, social anthropologists and agronomists. Explanations about the relationship between the specific socio-technical features of the farming system and the long and deep-rooted culture of agricultural practices offer an interesting perspective in terms of how we may understand change. The Ethiopian *ard* plough, which is a symmetrical tool made entirely of wood except for the metallic end piece attached to the ploughshare with a socket, is recognized as the distinguishing characteristic of Ethiopia's smallholder agriculture and the marker of a deep-rooted socio-technical feature that has been in use for more than two thousand years (McCann 1995). The tool is used to till and prepare the land for planting. A pair of oxen are used to drag it while tilling and, as a norm, a man operates it.

Iconized by the ox-plough system, Ethiopian smallholder agriculture has been a topic of intense discussion, often with different extrapolations. Some authors portray the plough as a technology that has been fit to its purpose. As McCann argues, over the course of time, the ox-plough system converted the northern highlands' dry green forests and grasslands into open farmlands and pasture that support the ox population (McCann 1997).

The book *People of the Plow* by McCann (1995) passionately describes the contextual peculiarity of Ethiopia's smallholder agriculture. He argues that the ox-plough system reveals the social structure, where the household is the central unit of production and consumption, and discusses cost-effectiveness, the domination of cereal crops in the agricultural system and the significance of the highland topographic context in which the system operates. As Cochet observes, the ox plough, as a means of production, has created 'unique social relations' within the Ethiopian peasantry (Cochet 2012: 127). Hence, far from being a technical entity, the plough system has defining implications for the social system. Access to and ownership of oxen and the plough as well as the specific gender relations that have developed around the technology are examples of how technology and culture are interlinked and have defined the farming system for such a long time.

Others argue that the ox-plough system symbolizes smallholder agriculture's stagnation over millennia and resistance to change. Although the plough system is suitable for tillage in mountainous and sloping landscapes, it has caused severe erosion of soil and degradation in the highlands of Ethiopia (FAO 1984). Furthermore, despite the strong culture of food production stretching back thousands of years, food insecurity and rural poverty have been major issues of concern. Periodic droughts that tend to emerge every eight to ten years have put millions of smallholders at risk (GoE 2016). Major global processes, such as climate change, pose enormous problems of frequent crop failure due to recurrent drought and diseases. The farming system overwhelmingly depends on rainfall, which further exacerbates its vulnerability (Conway and Schipper 2011). Hence, smallholder agriculture has not been able to cope with the emerging challenges over time. Therefore, in a nutshell, the necessity of doing something about smallholder agriculture in order to address the challenges it has been facing has been the mainstay of agricultural policy and research over the past decades and has become increasingly urgent (Jayne et al. 2010).

Neither of the two perspectives presented above is wrong. If anything, one can argue that to bring about change to address or adapt to the emerging global and local/contextual pressures is imperative. However, such approaches need to recognize and understand the historical, political and social contexts that have formed the farming system as we know it today. Approaches, especially external ones, that are designed to change the farming system also need to navigate the social contexts. Against this background, this book explores some of the significant social, economic and political dimensions of the Ethiopian smallholder farming systems; the conditions under which they operate; and prospects for change and transformation.

Diverse pathways of agricultural change

Three models or paths of agricultural structural transformation can be identified in the literature. One is the classical European model of agricultural transformation of the mid-nineteenth century, which was facilitated by the Industrial Revolution. Labour demands rose in the industry and, as a consequence, the rural was 'relieved' of a high density of population with the result that farm consolidation and accumulation became possible (Lucas 2009). The pull factor of the major exit of rural labour to urban areas was the industrialization process (Gollin et al. 2016). At the same time, European agriculture was able to supply food to a population which had doubled in size and was increasingly engaged in non-agricultural work (Grantham 1989: 43). The expansion in trade and manufacturing which was integrated with agriculture led to it being operated within market and industrial principles that reinforced its competitiveness (Lucas 2009). This allowed agriculture in the industrialized countries to generate capital and wealth that also perpetuated

innovation and technological progress in the sector. This in turn created the capacity to deploy high-input resources (energy, machinery, fertilizer, improved seeds) that powered productivity (Wrigley 2010).

During the post-industrial period, the political economy of the developed economies led to provision and protection of extensive systems of subsidies and support to the agriculture which defined its evolution (World Bank 1981; Gibbon et al. 1993).

The other agricultural development model is that of the Green Revolution that took place in Central America, but primarily Asia, in the mid-1960s to the 1970s. Studies about the Asian conditions preceding the Green Revolution indicate important lessons. The Asian agricultural system was (and continued to be) dominantly smallholder and, until the mid-1960s, hunger and malnutrition were widespread in Asia (Birner and Resnick 2010; Pingali 1997). Nevertheless, many of the Asian countries were already investing and expanding their irrigation systems and farmers were using fertilizer. The introduction of high-yielding cereal varieties, which were more responsive to plant nutrients, was not only fitting to the conditions and practices of the farming system that existed; it also accelerated use of irrigation and fertilizer, which grew by 2.1 per cent and 10.75 per cent respectively between 1967 and 1982 (Hazell 2009).

Furthermore, interacting and functioning systems of extension, credit, infrastructure and research resulted in successful diffusion of innovations (Hatmann and Linn 2008). Introduction of land development and consolidation programmes among smallholder farmers played a positive role in mitigating farmland losses and improving agricultural productivity (Liu et al. 2014). In addition to these agriculture-focused efforts, the role of the state was robust. Many Asian states sustained high levels of public investment infrastructure and promoted manufacturing sectors; and these are recognized as major reasons for the enormous increase in food production in Asia (Djurfeldt et al. 2005). As well, surplus labour moved from agriculture to more productive sectors, such as manufacturing and high-value services (Ripoll et al. 2017).

The relevance and applicability of the models indicated above, especially the Green Revolution, to contemporary Africa have been a topic of discussion (Frankeman 2014; Diao et al. 2008; Djurfeldt et al. 2005). Unlike the European agricultural transformation, which produced high-input, large-scale agricultural systems, the Asian case, which maintained the smallholder agricultural system as its dominant form, appears to be more relevant for Africa. Furthermore, Asian agriculture changed over a very short period because of concerted interventions. Therefore, the Asian experience has been appealing for Africa. Continental initiatives, such as the Alliance for a Green Revolution in Africa (AGRA 2016), regard the Green Revolution as Africa's pathway to transforming its agriculture. AGRA argues that the potential to accelerate an African Green Revolution depends on input intensification (ibid.: 114). Nevertheless, this ambi-

tion is not without challenges. Whether Africa can afford to adopt heavy use of inorganic fertilizers and pesticides in light of the high economic costs and negative ecological impacts is a key question (Delve and Benfica 2016). Similarly, progress in water and irrigation development in sub-Saharan Africa is low (about 4 per cent achieved) as compared to south Asia (39 per cent) and East Asia (29 per cent) (World Bank 2008; Delve and Benfica 2016).

The third model or pattern which appears in rural Africa is smallholder diversification (Havnevik 1993; Toulmin et al. 2000; Delgado and Siamwalla 1997). Two opposing strands of thought can be identified in the conceptualization of diversification. One conceptualizes diversification as a survival or subsistence strategy by the poor that is born out of multiple crises, i.e. economic, political and environmental/climatic (Asfaw et al. 2016; Teklewold et al. 2013), urbanization (Hovorka 2013), population pressure (Bezu and Holden 2014) and rising global food prices (Porter 2012). It argues that African smallholder households have no choice but to diversify their incomes through off-farm activities. Therefore, African smallholder diversification strategies signify not only a process towards multiple occupations, but a structural shift in the relative importance of agriculture – described by some as a deagrarianization and depeasantization process (Bryceson 2002). The key message here is that diversification out of agriculture is seen as a survival strategy for millions of African smallholders.

The other conceptualization of smallholder diversification simply sees it as an exit strategy. Off-farm and non-farm activities are in this perspective seen as integral parts of the farm incomes generated through multiple activities, and are also beneficial for the farms (Dercon and Hoddinott 2005; Delgado and Siamwalla 1997). Well-off farmers may use diversification strategies as a deliberate means of accumulation (Murton 1999). In this latter perspective, innovation and dynamism in the different activities are also important. These observations imply that smallholder agriculture is not operating in isolation from other broader processes of change, such as labour mobility, migration and urbanization. Understanding the various roles of non-farm rural activities is also crucial to a broader understanding of agriculture. This is also reflected in calls to situate agriculture within broader questions of rural transformation (Pesche et al. 2016; Ripoll et al. 2017), as well as urbanization (Gollin et al. 2016) and youth activity (Leavy and Hossain 2014).

Many of these arguments have emerged from the sustainable livelihood studies (e.g. Carney 1998), which have provided insights into rural dynamics. Initially developed to improve evidence-based interventions for development projects, the livelihood approach has been subject to a constant need to improve its theoretical depth. As De Haan argues, much of the evidence has been at micro-level, exploring endless local management practices (De Haan 2012), and such strategies were criticized for being insufficient to manage risks at scale.

Issues of power inherent in social relations, institutions and organizations are indicated as important elements that need to be considered (De Haan and Zoomers 2005). In a way, sustainable livelihood studies have highlighted the significance of contextually based comprehension of not only how people make a living, but also what offers meaning to people's lives (Bebbington 1999). This has important implications for how smallholders are perceived and involved in development projects. However, the literature on livelihoods typically is not able to show how diversification relates to structural change processes at a larger scale.

Land, property rights and land tenure systems are important dimensions of agricultural transformation and the agrarian question. Both internal and external institutions that govern access, transfer, accumulation and distribution of resources condition agricultural productivity and influence the course of change (De Soto 2000; Berry 1989; Pretty and Ward 2001). When states introduce radical land reforms or changes to property rights, this has major consequences for society and the conditions of agricultural change. Sustainability transition studies, which explore the transformative system changes of socio-technical regimes, indicate that pressure on natural resources and social conflicts over resources are integral parts of system dynamics and change (Grin 2010; Geels 2005).

The political landscape of the state–smallholder relationship

State–rural relations in Ethiopia are historically rich and complex. By focusing on the rural and agricultural policies, this section highlights the continuity and reproduction of certain policies, as well as the shifts in rural policies during the last few decades.

Ethiopia is home to Africa's oldest state, dating back centuries (Crummey 2000), and the relationship between the state and smallholder farmers has been complex (Clapham 1988; Dessalegn 2009). An interesting feature of this relationship is that the existence and functions of the state were founded on rural people and smallholder agriculture (Crummey 2000). The major part of state revenues was largely collected as taxes in kind from rural smallholders, which included different agricultural products. Therefore, the state depended upon smallholder agriculture for its functioning. Far from being harmonious, the state exploited and politically marginalized smallholder farms. At times violent conflicts occurred between them (Tareke 1977). In Ethiopia's modern history, the 1975 popular land reform iconizes decades of injustice in the state–rural relationship (Cohen and Weintraub 1975). The pre-1975 period was a period when feudal land relationships dominated the agricultural system. The elite that had direct control over rural land (as landholders and producers) also commanded political power. Tenancy, absentee landholding and eviction of tenants, especially in the southern parts of the country, were major problems.

The post-1975 land reform has shaped smallholder agriculture. Its effects are relevant for the current discussions about change and transformation in Ethiopian agriculture. The 1975 land reform achieved more or less equal distribution of land by returning land to rural households (Dessalegn 1984). As local communities strived to redistribute the land as equally as possible, the whole process reinforced smallholder agriculture, but it also created homogeneous landholding patterns. Private-sector commercial agriculture was nearly eliminated and smallholder agriculture became the regime of agriculture that defined Ethiopia. One major structural outcome of the land homogenization processes was limited differentiation in agriculture (Dessalegn 2005).

The post-1975 political narrative has been overwhelmingly about 'equitable' distribution of resources and not about 'efficiency' and 'productivity'. As Atakilte (2003) observes, in many villages in the Tigray region, frequent land redistributions were carried out within short periods of time. As a consequence household farms not only became smaller, but also more fragmented. Only recently did policy-makers decide to stop subdivision of agricultural plots. Today, Ethiopian smallholder farmers operate small and scattered fields. The impacts of this type of landholding structure on the management of the farm (land development, crop protection, labour use, etc.) are generally negative. Today, the belief that arable land can be equitably distributed, and individuals who want to farm can be guaranteed land, is a myth. In the aftermath of the land reform, adults (above the age of eighteen) were able to access land, but not today.

Smallholder agriculture is currently operating in a context of very high land scarcity. The youth in general have difficulty accessing land. Their on-farm participation is declining over time irrespective of gender, making them marginalized (Bezu and Holden 2014; Sakketa and Gerber 2017). The challenges of land scarcity and inequality have emerged as more of a generational problem.

The significance and essence of the 'equitable distribution of land' political narrative have increasingly become almost irrelevant in justifying further redistributive land policies. In fact, many regional states have decided to stop further subdivision of smallholder farms. However, smallholder farms are already small and fragmented. Furthermore, the land policy of the country sustains the status quo of the prevailing farm structures (small and fragmented plots). Policy initiatives that support processes of farm consolidation are not on the political horizon. The main constraining factor is the policy restriction on land transfer (see Chapter 8). How can such a policy lead to smallholder agriculture transformation?

While the politics and contradictions around land remain central, in other policy areas state–smallholder relations have changed significantly since the land reform. The period between 1975 and the late 1990s is generally described as the 'lost decade' for the country (Abebe 1998). The ideologically driven, radical socialist orientation of the state brought the country to the brink. The

government-imposed core rural policies and activities, such as forced collective agriculture, forced mobilization, displacement and resettlement of rural people, as well as state control of agricultural markets, heavily undermined smallholder agriculture (ibid.; Dessalegn 2009).

With the change in government in 1991, the role of the state has improved owing to the implementation of successive new policies. According to the World Bank, acceleration of economic progress started in 1992, with a shift to a higher gear in 2004 (World Bank 2015). During the 2000s, two consecutive economic policies that focused on poverty reduction were implemented; the ‘Sustainable Development and Poverty Reduction Programme for 2002/3–2004/5’ and the ‘Plan for Accelerated and Sustained Development to End Poverty for 2005/06–2009/10’ (PASDEP) (IMF 2011). To help rural poor facing chronic food insecurity, a large social protection programme called the Productive Safety Net Programme (PSNP) was launched in 2004. PSNP provides regular cash or food transfers to 8 million people (half of them are in areas affected by ongoing drought) and is one of the largest safety-net programmes in the world (World Bank 2017). This programme, which is run by the government with financial support from donor agencies, is expected to be fully independent of outside funding by 2025. Evaluation of the programme indicates achievement of positive results in enabling the rural poor to resist shocks, create assets and reduce the length of the food-deficit season (Guush et al. 2014). Overall, the proportion of the population below the poverty line has fallen from 44 per cent in 2000 to 23 per cent in 2014/15. Similarly, other major policy efforts that aimed at improving access to education, healthcare and other social services across the rural areas are believed to have contributed to poverty reduction.

Since 2011, the policy focus has shifted towards growth and transformation of the economy (‘Growth and Transformation Plan I for 2010/11–2014/15’ (GTP I) (FDRE 2010) and ‘Growth and Transformation Plan II for 2015/16–2019/20’) (GTP II) (MoFED 2015)). The vision of these plans is to transform the structure of the economy from an agricultural to an industry- and service-driven economy, and make Ethiopia become a middle-income country by 2025.

The major pathway to transformation is planned to be through export-oriented production schemes. The government set strategic policy priorities for investment in areas such as infrastructure and energy development. Recently, the manufacturing sector became the main priority area of investment and incentive systems; and across the country, a dozen industrial parks (estates) are being constructed. They are to be equipped with infrastructure – roads, communication, water and energy supply. Legal, advisory and administrative services are highly decentralized. These efforts have helped the country to attract FDI (WIR 2017).

With regard to the agricultural sector, the government is pursuing at least three parallel approaches. One is to continue the policies that aim to secure

rural livelihoods through the status quo of distributive and equitable access to land. In this regard the government is striving to enable rural youth to access marginal lands. The primary objective is to guarantee land as a means of survival. The other policy perspective is to transform smallholder agriculture from subsistence towards commercially oriented agriculture (EATA 2016). Although the strategy is not clear, the general expectation is that smallholder production will constitute sources of materials and inputs for the emerging manufacturing sector. The third approach is promotion of public and private (foreign and domestic) large-scale commercial farms. During the last ten years, large-scale farms have popped up rapidly and significant land areas have been allocated to this type of agriculture (Atakilte and Sandström 2016). The policy expectation as to the transformational capacity of this agricultural regime was high, but the outcomes have been mixed. Large-scale commercial farms that planned to produce food crops were generally unsuccessful (ibid.).

Brief introduction to the chapters

Chapters 1 and 2 provide contextual analysis, Chapters 3 and 4 are case studies on technology adoption, Chapters 5 and 6 present studies on food value systems and rural health, and Chapters 7 and 8 focus on cross-cutting issues. The conclusion summarizes the main issues raised in the book and possible policy-relevant recommendations.

Chapter 1 outlines the agricultural input supply and output marketing systems of the smallholder sector. It explores the prospects for commercializing smallholder agriculture and identifies the key challenges it is facing regarding input supply and marketing of crops (improved seeds, fertilizer and pesticide), livestock (animal breeds, feeds and health) and service provisions. The chapter also examines the capacity of both the state and markets to meet the needs of smallholder farmers for intensification of crop and livestock activities. In addition, the potential of primary cooperatives and farmer unions in fostering alternative institutional practices of input supply and output marketing is addressed. It further identifies policy and institutional gaps in supporting services that constrain the growth and commercialization of smallholder production.

Chapter 2 examines the discourses of large-scale agricultural investment and smallholder agriculture in Ethiopia in a historical perspective. While in the 1960 and 1970s, the focus of agricultural investment was on large-scale agriculture based on modernization principles, the 1980s was a socialist period when state-driven large-scale farms and cooperatives were favoured. During the last two decades the role of the private sector has been emerging as a key player in large-scale commercial farming, making Ethiopia a major destination for foreign direct investment in agriculture. During the same period, the government has given increased priority to smallholder agriculture. However,

the chapter points out that large-scale commercial and smallholder agriculture are treated as dual and separate systems.

The chapter further indicates the potential negative consequences from lack of policy efforts in integrating the two systems. This may undermine the potential contribution of large-scale commercial farms to smallholder agriculture in terms of access to technologies and value chains to access high-value markets. Sociocultural characteristics of rural people are perhaps one of the most neglected elements in the government's development approaches since local cultural and knowledge systems are overlooked.

Chapter 3 explores the development of institutional and organizational structures (among smallholder irrigators) connected to a large-scale irrigation canal system. The case study is the recently constructed Koga Irrigation Scheme (7,000 hectares), located in the Lake Tana Basin. The scheme is the first showcase of a series of planned irrigation schemes (about 72,000 hectares) in which massive public and multilateral investments are made as a matter of national priority. The smallholder farmers are planned to be the major beneficiaries of these investments, which are new for the country. These projects are expected to not only propel agricultural development, but also transform the rural economy in various sub-regions. The chapter analyses the major challenges in the transfer of the canal management from the state to the smallholder farmers in the context of formation of water cooperatives and in accessing agricultural markets.

Chapter 4 explores initiatives of alternative agricultural practices that potentially can help farmers address climate change while improving the long-term sustainability of farms. It identifies conservation agriculture as relevant to smallholder farmers and analyses the prospect of introducing such practices. Using household, farm and institutional data, it investigates farmers' preferences and willingness to accept and to participate in agricultural conservation programmes. The chapter also distinguishes factors conditioning farmers' decision-making on adoption of climate-smart agricultural practices. These include household labour, awareness about climate change impacts, education, land tenure and costs of alternative agricultural practices. The findings suggest that the unique needs of the existing mixed-crop/livestock farming systems hinder further diffusion of conservation tillage. It also indicates that future policy should consider addressing the needs of Ethiopian farmers, particularly crop producers who are heavily engaged in livestock activities.

Chapter 5 provides a deep analysis of the significance of local cultural and symbolic values in technology innovation which can lead to the implementation of ideas and activities that are important for rural and agrarian transformation. Using the crop *teff*, the chapter explores sociocultural and symbolic values of food among farmers. *Teff* is both endemic and the most commonly preferred staple crop used in the Ethiopian highlands. The crop has been cultivated for

millennia in the country. The chapter concludes that far from being issues of nutritional and agronomic factors, the crop is widely used across the highlands owing largely to symbolic and cultural values that the people attach to the crop. Nutritional, flavour, digestibility and other health benefits of *teff* are widely appreciated in Ethiopian society. In times of shortage and crisis in *teff* production, rural households stubbornly integrate local crops into existing culinary tradition rather than adopting new dietary and food preparation methods. The production and consumption of the crop *teff* also signify social status. Households and communities that regularly produce and consume *teff* are generally seen as successful and better off. The chapter demonstrates that agriculture constitutes a way of life and belief systems, and changes in habits and customs are complex cultural factors that take a long time to change. It is argued that approaches in research and policy need to be much more sensitive to the prevailing cultural values and perceptions of the local people. It suggests that policy approaches that aim at promoting agricultural change and transformation must go beyond agronomic frames of agricultural change. Instead, promotion and linking of local and traditional food cultures to the emerging local, national and food markets (supermarkets) should be part of the change and transformation agenda.

Chapter 6, using untapped archive material, seeks to investigate the malaria epidemics that broke out between 1950 and 2000 and examines the impact of the associated periodic health problems on smallholder production. Malaria has been one of the deadliest diseases in Ethiopia. About 68 per cent of Ethiopian people are living in malaria-prone areas. Most of these areas in the Lake Tana Basin have experienced seasonal malaria epidemics. In the past, some areas bordering Lake Tana also witnessed devastating malaria epidemics; the most severe broke out in 1953 and claimed thousands of lives. Since the epidemic coincided with the planting and harvesting seasons, it inflicted incalculable damage on agricultural production.

Chapter 7 studies impacts of land right policies on gender relations among smallholder farmers in the Amhara region. Women farmers in this region, as elsewhere in the country, constitute at least 50 per cent of the smallholder agricultural workforce. In addition to this, household activities (food preparation) and caring (children and elders) continue to be women's activities. Despite this, women are disadvantaged in many ways. To promote gender equality, the Amhara regional state implemented land policies that aim at promoting equitable access to and rights on rural land. The chapter confirms that the land policies have resulted in equitable distribution of land; and the state laws strive to provide legal protection for the land rights. However, the cultural values and norms are much more complex and resistant to change. Despite the positive achievements, women continue to be in a subordinate position in agricultural decision-making processes. These challenges are apparent among

women farmers who are single, do not have close male family members or are in a polygamous marriage. The chapter draws its empirical data and field observations from a large-scale rural study programme undertaken by the regional government.

Chapter 8 describes and analyses land rights in Ethiopia by providing a historical profile and evaluates the current outcomes as regards the tenure rights systems of smallholders. It shows three key aspects of land – rights, equity and land markets – that have been central in the recent past. Before 1970 the system was better in terms of provision of land rights, but was still inequitable, with land being controlled by the elite. In the 1980s the land tenure system was equitable, but it restricted the freedom to use one's property rights. Since the 1990s, two key questions have been emerging: how to ensure equity in landholding, while at the same time liberalizing the land rights of the people. The chapter argues that the current government should do more to improve access to land-use rights and liberalize land rights in the country within the given constitutional arrangement. Through improving access to rural land, liberalizing landholding rights and fair compensation for loss of properties during expropriation, the current government could improve security of land rights and, hence, the prospects for sustainable development.

Enduring issues concerning smallholder agriculture

Consideration of context-specific legal-institutional, sociocultural, economic and political structural factors are also crucial to understanding how social-technical changes evolve from (in)formal, institutional and bureaucratic governance arrangements. While recognizing the capacities and creativities of farmers, critical analysis of the challenges of smallholder agriculture is also necessary. The following enduring issues signify critical conditions that must be considered carefully in relation to the Ethiopian smallholder agricultural change and transformation agenda.

VULNERABILITY: Ethiopia's smallholder agriculture is highly vulnerable to multifaceted internal and external factors. According to recent national socio-economic survey data, main shocks include illness of household members (23 per cent of households), drought (21 per cent), increase in the price of food items (21 per cent) and price increases for agricultural inputs (14 per cent) (CSA 2017). Environmental degradation in terms of soil, water and biodiversity is a major problem in many parts of the highland and mountainous areas of the country (Shiferaw and Holden 1998). Dependency on rainfall is another major cause of vulnerability. The global climate change impacts have strained the agricultural system and periodic droughts have led to massive crop failures in the southern, eastern and northern parts of the country (GoE 2016). These changes include an extension of the dry season (shortening of

the wet season); an increase in the uncertainty of yearly weather patterns, particularly in terms of precipitation variability and timing of the wet season; a more extreme (drier and hotter) end to the main dry season; more intense (extreme) weather (heavier rain, hotter days); and warmer nights (Jury and Funk 2013; Dudu 2012).

The major feature of vulnerability for smallholder agriculture is that many of the farmers are located close to the poverty line. When major shocks occur, many fall back into poverty and food insecurity. The 2015 El Niño caused weak and erratic summer rains that negatively affected farmers. Within a span of one year, the number of food-insecure people needing humanitarian assistance rose from 2.9 million (January 2015) to 10.2 million (January 2016) (GoE 2016). Even during normal rainfall seasons, a large number of households are vulnerable to shocks, oscillating between being poor and not-poor, than is implied by the standard poverty statistics (Dercon and Krishnan 2000). Such studies often focus on exploring the resilience potential of farmers in the short run. However, the social and economic scars of disasters and emergencies can also be deep and long-term. Damage to future livelihoods through loss of animals, seeds and labour, as well as disconnection from input and output channels, etc., constitute elements of the vulnerability context (Bhavnani et al. 2008).

SMALL AND FRAGMENTED FARMS: The structural challenge of Ethiopian smallholder farmers is that they operate very small and fragmented farms. In 2014/15, the average landholding sizes per household were recorded at 1.14 hectares while the average cropland area per household was 0.95 hectares (CSA 2017). The number of plots constituting a household farm ranges between three and eleven (ibid.). The general pattern has been a successive decline in land size. This trend is perhaps one of the central structural and agrarian questions that Ethiopia has not been able to address. It implies that the conditions in which the agricultural system operates perpetuate distribution of resources rather than accumulation and consolidation of resources among households (Atakilte 2003). In a context where rural livelihoods are vulnerable, and agriculture is the main source of income, smallholders generally stick to their land resources and distribute the farms among themselves (within communities, household members, siblings, etc.). Cultural and traditional practices, such as marriage, also reinforce the significance of holding land. Furthermore, the land policy in particular is perhaps the major reason for the current impasse. As will be explained in Chapter 8, the recent land redistribution programmes, as well as the constraints in land transfer, have reinforced the pattern of land fragmentation and the decline in farm size.

LONG-TERM LAND TRANSFER RESTRICTIONS AND LOW DIFFERENTIATION OF SMALLHOLDERS: It is well recognized that social and political processes that perpetuate inequality and cumulative polarization of means of production are generally regarded as socially undesirable (Ravallion 2001). However, allowing economic and social processes that enable farmers to adjust their farming structure through transfer of resources is crucial. Often, discussions about smallholder resource allocation decisions do not question the farm structure. For instance, consideration of optimal farm sizes for adoption and scaling up of new technologies and the production regime by rural households is largely missing. There is ample evidence that households that have bigger farms (in relative terms) tend to adopt new practices (e.g. Zeng et al. 2018; Mazvimavi and Twomlow 2009). Therefore, institutions that define transfer of key resources like land are crucial. For Ethiopia, questions of equity and equitable access to land resources have been the major focus of the policies and politics of the country since 1975. What is remarkable about Ethiopia is that land is equitably distributed and unimodal among the smallholder farmers. This policy has significantly diminished processes of social and economic differentiation of smallholder farmers. Studies indicate that land is not the main differentiating factor among the landholding households (Kebede 2006; Atakilte 2003).

In a context where land is scarce and equitably distributed, continued restrictions on long-term transfer of land result in low differentiation. In terms of the vulnerability of the farms to change (such as weather fluctuation), cropping patterns (crop choice) and technology employed, there are no major differences among the rural households in a given community. Compared to other African countries, where customary and private ownership of land are practised, the dominant mechanism for accessing arable land in Ethiopia is through government land redistribution programmes. Household redistribution, such as through inheritance, is also an important access mechanism, but on a generational scale. In light of the limited potential for land transfer (due to the rigid land policies which prohibit long-term transfers, land availability and the majority being dependent on land), the prospects for accessing and holding land in order to match a household's non-land farm resources, such as labour, capital and/or oxen, are limited (Atakilte 2003). Innovative and capable households' main chance to access land is to rent from other households (ibid.).

OLDER LANDHOLDERS, THE YOUTH AND INNOVATION: Ethiopia's population is dominated by the youth, with 45 per cent of the population under fifteen and 71 per cent under the age of thirty (CSA 2014a). Given the fact that the majority of the youth live in rural areas, the potential contribution of rural youth to economic and sustainable development depends on job opportunities. Recent studies indicate that the youth unemployment rate is 7 per cent and that

25 per cent of youth aged fifteen to twenty-nine are underemployed (Brousard and Tekleselassie 2017). Whether and how smallholder agriculture can accommodate youth and land-constrained agricultural innovators is a central question facing smallholder agriculture and the rural areas of Ethiopia. Differences in opportunities and constraints on access to and holding of land among smallholder farmers are more generational rather than other factors (such as capital, capacity or knowledge). The future engagement of youth in agriculture and agricultural innovation is a huge challenge.

LARGE-SCALE LAND ACQUISITIONS AND SMALLHOLDER AGRICULTURE: Enticed by the increasing global demands for food, feed and fibre since 2008, Ethiopia has promoted large-scale agricultural investment policies (Atakilte and Sandström 2016). These investments have led to record transfers and acquisitions of arable land and water resources to a variety of investors, including sovereign states, private and domestic investors, and public enterprises (ibid.; Matondi et al. 2011). The emergence and growing role of new stakeholders in Africa's agriculture has led to new interests and dynamics. The role of the state in facilitating, supporting and accommodating large-scale agriculture is not without challenges. Policies that undervalue land to attract investment may reinforce inequality in societies. Expropriation of land resources from local people, and the low compensation provided to them by governments, have become major social and political issues. Furthermore, the policy perspective regarding large-scale commercial farms' potential to generate positive contributions in relation to rural economy needs to be revisited.

Note

¹ The remaining crops being barley, sorghum and millet. The shares of production of the remaining temporary main crops were: root crops (13 per cent), pulses (6 per cent), oilseeds (2 per cent) and vegetables (1 per cent). Permanent crops include *enset*, grown only in a limited agroecology (13 per cent), and cash crops (such as coffee) (5 per cent). The large commercial farms produce mainly industrial crops, such as sugar cane and cotton (CSA 2015a).

References

- Abebe, T. (1998) *Tenants of the State: The limitations of revolutionary agrarian transformation in Ethiopia, 1974–1991*, Lund: Lund University.
- AfDB (2016) 'African economic outlook 2016', www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/AEO_2016_Report_Full_English.pdf.
- AGRA (2016) *Progress towards agricultural transformation, Africa Agriculture Status Report 2016*, Alliance for Green Revolution in Africa (AGRA).
- Asfaw, S., F. Battista and L. Lipper (2016) 'Agricultural technology adoption under climate change in the Sahel: micro-evidence from Niger', *Journal of African Economies*, 25(5): 637–69.
- Atakilte Beyene, A. (2003) 'Soil conservation, land use and property rights in northern Ethiopia: understanding environmental change

- in smallholder farming systems, PhD dissertation, Uppsala: Swedish University of Agricultural Sciences.
- Atakilte Beyene, A. and E. Sandström (2016) 'Emerging water frontiers in large-scale land acquisitions and implications for food security in Africa', in T. Tvedt and T. Oestigaard (eds), *A History of Water: Water and Food in Africa*, I. B. Tauris, pp. 502–20.
- Bebbington, A. (1999) 'Capitals and capabilities: a framework for analyzing peasant viability, rural livelihoods and poverty', *World Development*, 27(12): 2021–44.
- Berry, S. (1989) 'Social institutions and access to resources', *Africa*, 59: 41–55.
- Bezu, S. and S. Holden (2014) 'Are rural youth in Ethiopia abandoning agriculture?', *World Development*, 64: 259–72.
- Bhavnani, R., S. Vordzorgbe, M. Owor and F. Bousquet (2008). 'Report on the status of disaster risk reduction in the sub-Saharan Africa region', Nairobi: Commission of the African Union, the World Bank and the United Nations Office for Disaster Risk Reduction.
- Birner, R. and D. Resnick (2010) 'The political economy of policies for smallholder agriculture', *World Development*, 38(10): 1442–52.
- Bond, P. (2017) "Africa Rising" in retreat: new signs of resistance', *Monthly Review Foundation*, 69(4), monthlyreview.org/2017/09/01/africa-rising-in-retreat/.
- Broussard, N. and T. Teskleselassie (2017) 'Youth unemployment: Ethiopia country study', International Growth Centre Working Paper 12/0592, London: London School of Economics and Political Science.
- Bryceson, D. (2002) 'The scramble in Africa: reorienting rural livelihoods', *World Development*, 30(2): 725–39.
- Carney, D. (1998) *Sustainable Rural Livelihoods. What contribution can we make?*, Nottingham.
- Christiaensen, L., L. Demery and J. Kuhl (2011) 'The (evolving) role of agriculture in poverty reduction – an empirical perspective', *Journal of Development Economics*, 28: 239–54.
- Clapham, C. (1988) *Transformation and Continuity in Revolutionary Ethiopia*, Cambridge: Cambridge University Press.
- (2017) 'The Ethiopian developmental state', *Third World Quarterly*, doi: 10.1080/01436597.2017.1328982.
- Cochet, H. (2012) 'A new perspective on animal traction in Ethiopian agriculture', *Ityopis*, 1: 126–43.
- Cohen, J. and D. Weintraub (1975) *Land and Peasants in Imperial Ethiopia: The social background of a revolution*, Assen: Van Gorcum.
- Collier, P. and S. Dercon (2013) 'African agriculture in 50 years; smallholders in a rapidly changing world?', *World Development*, 63: 92–101.
- Conway, D. and E. Schipper (2011) 'Adaptation to climate change in Africa: challenges and opportunities identified from Ethiopia', *Global Environmental Change*, 21: 227–37.
- Crummey, D. (2000) *Land and Society in the Christian Kingdom of Ethiopia: From the Thirteenth to the Twentieth Century*, University of Illinois Press.
- CSA (Central Statistical Agency) (2014a) *Ethiopia Mini Demographic and Health Survey 2014*, Addis Ababa: Central Statistical Agency of Ethiopia.
- (2014b) *Land Utilization: Private peasant holdings, meher season: Agricultural sample survey 2014/2015, vol. IV*, Addis Ababa: Central Statistical Agency of Ethiopia.
- (2015a) *Agricultural Sample Survey Time Series Data for National and Regional Level from 1995/96 to 2014/15: Report on Area and Production of Crops*, Addis Ababa: Central Statistical Agency of Ethiopia.
- (2015b) *A Series of Agriculture Sample Survey 2004/05–2014/15: Report on Crop and Livestock Product*

- Utilization (Private Peasant Holdings, Meher Season), Addis Ababa: Central Statistical Agency of Ethiopia.
- (2017) 'Third wave (2015–16) of the Ethiopia Socioeconomic Survey (ESS) panel data, CSA in collaboration with the World Bank's Living Standards Measurement Study (LSMS)', microdata.worldbank.org/index.php/catalog/2783/study-description.
- De Haan, L. (2012) 'The livelihoods approach: a critical exploration', *ERDKUNDE*, 66(4): 345–57.
- De Haan, L. and A. Zoomers (2005) 'Exploring the frontier of livelihoods research', *Development and Change*, 36(1): 27–47.
- De Janvry, A. and E. Sadoulet (2010) 'Agricultural growth and poverty reduction', *World Bank Research Observer*, 25: 1–20.
- De Soto, H. (2000) *The Mystery of Capital*, New York: Basic Books.
- Delgado, C. and A. Siamwalla (1997) 'Rural economy and farm income diversification in developing countries', Discussion Paper no. 20, Washington, DC: Markets and Structural Studies Division, International Food Policy Research Institute.
- Delve, R. and R. Benfica (2016) 'Agricultural productivity through intensification and local institutions', in Alliance for a Green Revolution in Africa (AGRA), *Progress towards agricultural transformation in Africa, Africa Agriculture, Status Report 2016*, pp. 105–24.
- Dercon, S. and J. Hoddinott (2005) 'Livelihoods, growth and links to market towns in 15 Ethiopian villages', FCND Discussion Paper 194, ssrn.com/abstract=774325.
- Dercon, S. and P. Krishnan (2000) 'Vulnerability, seasonality and poverty in Ethiopia', *Journal of Development Studies*, 36(36): 25–53.
- Dessalegn Rahmato (1984) *Agrarian Reform in Ethiopia*, Uppsala: Scandinavian Institute of African Studies.
- (2005) From Heterogeneity to Homogeneity: Agrarian class structure in Ethiopia since the 1950s, Addis Ababa: Forum for Social Studies.
- (2009) The Peasant and the State. Studies in Agrarian Change in Ethiopia 1950s–2000s, Addis Ababa: Addis Ababa University Press.
- Diao, X., D. Headey and M. Jihnson (2008) 'Towards a green revolution in Africa: what would it achieve, and what would it require?', *Agricultural Economics*, 39: 539–50.
- Djurfeldt, G., H. Holmen, M. Jirstrom and R. Larsson (2005) *The African Food Crisis: Lessons learned from the Asian Green revolution*, CABI Publishing.
- Dudu, P. (2012) Impacts of Climate Change on Coffee Farming in Ethiopia, Lambert Academic.
- EATA (Ethiopian Agricultural Transformation Agency) (2016) *Agricultural Transformation Agenda, Annual Report 2015–16*, Addis Ababa: Ethiopian Agricultural Transformation Agency.
- Fantu Bachewe, Guush Berhane, B. Minten and Alemayehi Tafesse (2017) 'Agricultural transformation in Africa? Assessing the evidence in Ethiopia', *World Development*, July.
- FAO (1984) *Ethiopian Highlands Reclamation Study*, Final Report, vols 1–2, Rome.
- FDRE (Federal Democratic Republic of Ethiopia) (2010) 'Growth and Transformation Plan 2010/11–2014/15', Addis Ababa: Ministry of Finance and Economic Development.
- Frankeman, E. (2014) 'Africa and the Green Revolution. A global historical perspective', *NJAS – Wageningen Journal of Life Sciences*, 70/71: 17–24.
- Geels, W. (2005) 'The dynamics of transitions in socio-technical systems: a multilevel analysis of the transition pathway from horse-drawn carriage to automobiles (1860–1930)', *Technology Analysis and Strategic Management*, 17: 445–76.

- Giannecchini, P. and I. Taylor (2018) 'The eastern industrial zone in Ethiopia: catalyst for development?', *Geoforum*, 88: 28–35.
- Gibbon, P., K. Havnevik and K. Hermele (1993) *A Blighted Harvest: The World Bank and African Agriculture in the 1980s*, London and Trenton, NJ: James Currey and Africa World Press.
- GoE (Government of Ethiopia) (2011) 'Growth and Transformation Plan 1', Addis Ababa: Federal Democratic Republic of Ethiopia.
- (2016) 'Humanitarian requirements document: joint government and humanitarian partners' document', Addis Ababa: National Disaster Risk Management Coordination Commission.
- Gollin, D., R. Jedwab and D. Vollrath (2016) 'Urbanization with and without industrialization', *Journal of Economic Growth*, 21: 35–70.
- Grantham, G. (1989) 'Agricultural supply during the industrial revolution: French evidence and European implications', *Journal of Economic History*, XLIX: 43–72.
- Grin, J. (2010) 'Understanding transitions from a governance perspective', in J. Grin, J. Rotmans and J. Schot (eds), *Transitions to Sustainable Development: New directions in the study of long term transformative change*, New York: Routledge.
- Guush Berhane, G. Daniel, J. Hoddinott, N. Kumar and Alemayehu Taffesse (2014) 'Can social protection work in Africa? The impact of Ethiopia's Productive Safety Net Programme', *Economic Development and Cultural Change*, 63(1): 1–26.
- Hatmann, A. and J. Linn (2008) 'Scaling up: a framework and lessons for development effectiveness from literature and practice', Working Paper 5, Wolfensohn Centre for Development, October.
- Havnevik, K. (1993) *Tanzania – the limits to development from below*, Dar es Salaam: Nordic Africa Institute and Mkuki na Nyota.
- Hazell, P. (2009) 'The Asian Green Revolution', IFPRI Discussion Paper, Washington, DC: International Food Policy Research Institute.
- Hovorka, A. (2013) 'The case for a feminist foodscapes framework: lessons from research in urban Botswana', *Development*, 56(1): 123–8.
- IMF (2011) 'The Federal Democratic Republic of Ethiopia: Joint Staff Advisory Note on the Growth and Transformation Plan 2010/11–2014/15', Washington, DC: International Monetary Fund.
- Jayne, T., D. Mather and E. Mghenyi (2010) 'Principal challenges confronting smallholder agriculture in sub-Saharan Africa', *World Development*, 38(10): 1384–98.
- Jury, R. and C. Funk (2013) 'Climate trends over Ethiopia: regional signals and drivers', *International Journal of Climatology*, 33: 1924–35.
- Kebede, B. (2006) 'Land reform, distribution of land and institutions in rural Ethiopia: analysis of inequality with dirty data', www.csae.ox.ac.uk/workingpapers/pdfs/2006-05text.pdf.
- Leavy, J. and N. Hossain (2014) 'Who wants to farm? Youth aspirations, opportunities and rising food prices', IDS Working Paper 439, Brighton: Institute of Development Studies.
- Liu, Y., F. Fang and Y. Li (2014) 'Key issues of land use in China and implementations for policymaking', *Land Use Policy*, 40: 6–12.
- Lucas, R. (2009) 'Trade and the diffusion of the Industrial Revolution', *American Economic Journal: Macroeconomics*, 1(1): 1–25.
- Matondi, P., K. Havnevik and Atakilte Beyene, A. (2011) 'Introduction: Biofuels, food security and land outsourcing', in P. Matondi, K. Havnevik and Atakilte Beyene (eds), *Biofuels, Land Grabbing and Food Security in Africa*, Africa Now series, London: Zed Books, pp. 11–38.

- Mazvimavi, K. and S. Twomlow (2009) 'Socio-economic and institutional factors influencing adoption of conservation farming by vulnerable households in Zimbabwe', *Agricultural Systems*, 101: 20–29.
- McCann, J. (1995) *People of the Plow. An agricultural history of Ethiopia 1800–1900*, Madison: University of Wisconsin Press.
- (1997) 'The plow and the forest. Narratives of deforestation in Ethiopia, 1840–1992', *Environmental History*, 2: 138–59.
- MoANR (2016) 'Policies and Strategies', Addis Ababa: Ministry of Agriculture and Natural Resources, www.moa.gov.et/policies-and-strategies.
- MoFED (Ministry of Finance and Economic Development) (2015) 'Growth and Transformation Plan 2015/16–2019/20', Addis Ababa: Federal Democratic Republic of Ethiopia.
- Moller, L. and K. Wacker (2017) 'Explaining Ethiopia's growth acceleration – the role of infrastructure and macroeconomic policy', *World Development*, 96: 198–215.
- Murton, J. (1999) 'Population growth and poverty reduction in Machakos District, Kenya', *Geographical Journal*, 165: 37–46.
- NEPAD (2016) 'A new emerging rural world: an overview of rural change in Africa', www.nepad.org/resource/new-emerging-rural-world-overview-rural-change-africa.
- Oneiwu, A. (2015) *Emerging Issues in Contemporary African Economies: Structure, policy and sustainability*, USA: Palgrave Macmillan.
- Pesche D., B. Losch and J. Imbernon (2016) *A New Emerging Rural World – an Overview of Rural Change in Africa*, 2nd, revised and supplemented edn, NEPAD and CIRAD.
- Pham, P. and A. Hruby (2016) 'Embracing impact: how Africa can overcome the emerging market downturn', Issue Brief, Africa Centre, Atlantic Council.
- Pingali, P. (1997) 'From subsistence to commercial production systems: the transformation of Asian agriculture', *American Journal of Agricultural Economics*, 79(2): 628–34.
- Porter, C. (2012) 'Shocks, consumption and income diversification in rural Ethiopia', *Journal of Development Studies*, 48(9): 1209–22.
- Pretty, J. and H. Ward (2001) 'Social capital and the environment', *World Development*, 29: 209–27.
- Radelet, S. (2010) *Emerging Africa: How 17 Countries Are Leading the Way*, Washington, DC: Center for Global Development.
- Ravallion, M. (2001) 'Growth, inequality, and poverty: looking beyond averages', Policy Research Working Paper 2558, Washington, DC: World Bank.
- Ripoll, S., J. Andersson, L. Badstue, M. Buttner, J. Chamberlin, O. Erenstein and J. Sumberg (2017) 'Rural transformation, cereals and youth in Africa: what role for international agricultural research?', *Outlook on Agriculture*, 46(3), SAGE.
- Rodrik, D. (2016) 'An African growth miracle?', *Journal of African Economies*, doi: 10.1093/jae/ejwo27.
- Sakketa, T. and N. Gerber (2017) 'Rural shadow wages and youth agricultural labour supply in Ethiopia: evidence from farm panel data', Discussion Papers on Development Policy no. 236, Bonn: Centre for Development Research.
- Shiferaw, B. and S. Holden (1998) 'Resource degradation and adoption of land conservation technologies in the Ethiopian Highlands: a case study in Andit Tid, North Shewa', *Agricultural Economics*, 18(3): 233–47.
- Tareke, G. (1977) 'Rural protest in Ethiopia, 1941–1970: a study of three rebellions', Unpublished PhD thesis, Syracuse University.
- Teklewold, H., M. Kassie and B. Shiferaw (2013) 'Adoption of multiple sustainable agriculture practices in

- rural Ethiopia', *Journal of Agricultural Economics*, 64(3): 597–623.
- Toulmin, C., R. Leonard, K. Brock, N. Coulibaly, G. Carswell and D. Dea (2000) 'Diversification of livelihoods: evidence from Mali and Ethiopia', Research Report 47, Brighton: Institute of Development Studies.
- Vandercasteelen, J., Seneshaw tamru, B. Minten and J. Swinnen (2017) 'Cities and agricultural transformation in Africa: evidence from Ethiopia', *World Development*, December.
- Verhoeven, H. (2015) 'Africa's next hegemony. Behind Ethiopia's power plays', *Foreign Affairs*, 12 April.
- WIR (World Investment Report) (2017) 'Investment and the digital economy, United Nations Conference on Trade and Development', Geneva: UN Publications.
- World Bank (1981) *Accelerated Development in Sub-Sahara Africa: An Agenda for Action*, Washington, DC: World Bank.
- (2008) *World Development Report: Agriculture for Development*, Washington, DC: World Bank.
- (2015) 'Ethiopia Poverty Assessment 2014', Washington, DC: World Bank, openknowledge.worldbank.org/handle/10986/21323.
- (2016) 'Ethiopia's Great Run: the growth acceleration and how to pace it', Unpublished Report no. 99399-ET, World Bank Group.
- (2017) 'World Bank to help Ethiopia build national Safety Net Systems as a more effective response to droughts', Press Release no. 2018/020/AFR, Addis Ababa.
- Wrigley, E. (2010) *Energy and the English Industrial Revolution*, Cambridge: Cambridge University Press.
- Zeng, D., J. Alwang, J. Norton, Moti Jaleta, Bekele Shiferaw and Chilot Yirga (2018) 'Land ownership and technology adoption revisited: improved maize varieties in Ethiopia', *Land Use Policy*, 72: 270–79.

1 | Agricultural input supply and output marketing systems

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Introduction

Studies indicate that the competitive advantages of smallholder farms over large commercial farms lie principally in their use of family labour at much lower transaction costs and their intensive indigenous knowledge (Hazell et al. 2007; Poulton et al. 2005). On the other hand, smallholders face high unit-of-transaction costs in almost all non-labour transactions, including purchased inputs, credit services and output markets (Dorward 1999; Kydd and Poulton 2000; Lipton 2005). Since the process of intensification requires increased use of purchased inputs and services, it increases the challenge to smallholders in the process. This chapter explores the priorities and challenges in agricultural input supply and output marketing systems of smallholder farmers in the crop and livestock sectors of Ethiopia. The discussion begins by examining the main input and output marketing needs of smallholder farmers for intensification of agriculture (crop and livestock), the capacity of both the state and markets to meet these needs, and the major constraints to and opportunities for meeting these needs. Finally, the chapter indicates policy and strategic considerations needed in the areas of agricultural input supply, output marketing and institutional support services development in order to stimulate a more rapid and sustained commercialization and growth of smallholder agriculture.

Agricultural input use and supply systems of smallholder farmers

Agricultural inputs like improved seeds, fertilizers and agro-chemicals are important in improving soil fertility and reducing negative effects of weeds, pests and diseases. As a result crop productivity improves. Intensification of agriculture with these inputs requires both availability of input, rural finance and competitive marketing systems. Intensification, therefore, involves the development of supply chains around smallholder farmers, with simultaneous and complementary investments in all links in the supply chain. The institutional support services of credit, input supply and extension are important in order to make these agricultural inputs easily available to smallholders and improve the technical skills and knowledge of farmers in properly using

and managing these inputs. Studies indicate that differences in access to these services have significant effects on intensity of input use and overall crop and livestock productivity. Smallholders who have access to credit for input purchase and supply systems have used fertilizer and chemicals more intensively and attained higher crop productivity per hectare of land (EEA/EEPRI 2006; Spielman et al. 2011; Fentahun and Merkuiz 2014). For example, smallholder farmers who accessed credit for improved seed purchase achieved approximately a 13 per cent yield increase compared to those who didn't have access (Berhanu et al. 2009). The research results of the Amhara Regional Agricultural Research Institute also indicated that farmers could achieve a yield advantage of 17–41 per cent in sorghum, 110–113 per cent in barley and 19–32 per cent in *teff* production through use of improved seeds over the current national average yield of 23.69, 19.65 and 15.75 quintals per hectare (q/ha) respectively (CSA 2015a).

The intensity of seed use is less affected by access to credit and input supply services as compared to the intensity of fertilizer and chemical use. This may be why most smallholders (96 per cent) use their own saved seed, instead of relying on the market (CSA 2011). They also procure seed from their neighbourhood farmers or traders in the nearby local markets. However, the quality of seed obtained through these traditional seed supply systems, as well as its potential impact on overall crop productivity, may need further investigation.

The rural areas in Ethiopia are characterized by low total and monetary incomes. Most people have limited consumption and savings; hence the monetary economy base is narrow and the markets (for agricultural inputs, outputs, finance, consumer goods and services, etc.) thin. The volumes traded are small and prone to large seasonal variability in demand and supply. These conditions normally coexist with poor road facilities and telecommunications, poor information (particularly in agriculture on prices, new technologies and potential contracting partners), difficulties in enforcing contracts, and widespread rent-seeking behaviour. Such conditions pose particular problems for the supply-chain development needed for agricultural intensification, and these are exacerbated by the fact that such development may require significant simultaneous and complementary investments by a number of market participants.

Such investments carry high risks of transaction failure and hence high transaction costs incurred in obtaining protection against such risks. According to Poulton et al. (2006), these transaction risks have three main components: coordination, opportunism and rent-seeking risks. Coordination risks refer to the risk of an investment failing owing to the absence of complementary investments by other players in a supply chain. Opportunism risks arise when a contracting party with monopolistic control over a complementary investment/service removes or threatens to remove it from the supply chain after a player has made an investment that depends upon it. Rent-seeking risks arise

when powerful government, political, criminal or other agents not party to a transaction see associated investments and/or revenue as an opportunity to expropriate or threaten to expropriate income or assets from the investor. Coordination, opportunism and rent risks and costs are closely related; where these are high as compared with potential returns on investment, the investments required for the development of an agricultural intensification supply chain may be too risky to be worthwhile, and thus the supply chain may not develop even if it is otherwise potentially profitable.

Input use and supply systems in the crop sector From the 1990s, the government introduced a range of economic reforms that sought to boost agricultural production. A hallmark of this strategy was the introduction of several large-scale programmes designed to intensify cereal production with improved seeds, chemical fertilizers and credit. The intensification campaign focused on cereals in the moisture-reliant highlands, where 60 per cent of the rural population live and where the strategy had the best chance of success. Results indicate that crop technology packages could make a huge difference in productivity. Maize yield, for example, can be increased from current farmers' yields of 3.4 (CSA 2015a) to 12 tons per hectare (MoA 2014) if farmers use the right type and quantity of improved seed and fertilizers with proper management practices.

The government introduced the Participatory Demonstration and Training Extension System (PADETES) in 1994/95 to carry out the intensification programme. This was later supported by a large-scale demonstration programme led by Sasakawa Global 2000. The programme followed a technology-based supply-driven intensification strategy consisting of enhanced supply and promotion of improved seeds and fertilizers, on-farm demonstration of improved farm practices and technologies, improved credit services for input purchase, and close supervision of farmers' extension plots. Over a ten-year period, PADETES reached about 40 per cent of the roughly ten million farm households in Ethiopia. Data from millions of demonstrations carried out through PADETES (3.6 million in 1999) indicated that the adoption of seed-fertilizer technologies could more than double cereal yields and would be profitable to farmers in moisture-reliant areas (Crawford et al. 2003). Cereal-producing farmers' participation in the extension programme reached 3.5 million in 2014 from 2.4 million in 2000, during which time cereal yields increased from 1.12 to 2.33 tons per hectare (FAOSTAT 2017), a little over twofold.

A key feature of PADETES and its predecessors such as the National Agricultural Extension Intervention Programme (NAEIP) was the primary role played by the state. Improved seed was developed, multiplied and distributed by public organizations and agencies, fertilizer was distributed (primarily) through public channels, credit was disbursed through state-guaranteed credit

institutions, and extension services were provided by the public sector (bureaus of agriculture at district, zone and regional levels). A decade after PADETES, and in the midst of another state-led cereal intensification programme, the Ethiopian economy has changed. While the extent and depth of this change are a matter of some debate, there are concerns that these programmes are not consistently generating the desired impacts (Byerlee et al. 2007; DSA 2006; EEA/EEPRI 2006). Yet agricultural input markets, extension services and agricultural education and training have changed relatively little in spite of this. The state continues to play a dominant role, and the effectiveness of its interventions is now coming under increasing scrutiny.

The recent smallholder intensification programme has drawn prominent attention to the role of chemical fertilizer, seed and credit. According to CSA reports, between 2011 and 2015 use of fertilizer and improved seeds increased by 78 per cent and 154 per cent respectively. Similarly, farm credit increased from 8.1 to 150.2 million birr and the number of farmers participating in the extension programme rose from 2.57 million to 3.64 million during the same period. Pesticide use grew by 197 per cent in 2010 from 1,390.2 tons of pesticides in 2005 (FAOSTAT 2017).

Farmers are innovating around the simple extension packages provided, but the flexibility to do so is constrained by the programme. For instance, in Wolayta in southern Ethiopia farmers were very keen to make use of fertilizers in their dry-land outfields, but not at the rates recommended. They observed that applying such amounts when rainfall is low and management limited because of other labour demands is potentially damaging to the crop and certainly uneconomical. Farmers are instead keen to make use of lower amounts of fertilizer through focused application, which maximizes nutrient uptake to individual plants through spot application, requiring a lesser overall amount (and so lower cost) than blanket application, as recommended in the government package. Such local-level patterns of farming practices do not appear in the generic, national-level assessments so often quoted. However, recognizing patterns of farmer innovation (and the wider conditions under which technology adoption is facilitated) needs to be taken more seriously in the design and implementation of technology-led, agricultural intensification programmes.

IMPROVED SEEDS Seed is one of the important inputs for intensification of smallholder agriculture. Increasing the quality of seeds can increase the yield potential of the crop by significant amounts and is thus one of the most economical and efficient inputs to agricultural development (FAO 2006). The availability of quality seed is the foundation for food production and productivity and is a precursor to crop and food diversity and security. Efforts to improve the performance of the agricultural sector should include seed

production and delivery systems. Generation and transfer of improved technologies are critical prerequisites for agricultural development, specifically for an agrarian economy like that of Ethiopia. Although a significant number of improved varieties of various crops are released by the national agricultural system, there has been limited use of improved seeds (4 per cent) by most of the farmers (CSA 2011). Thus, adoption of improved seeds in Ethiopia has generally been disappointing. Official estimates suggest that while the total quantity of improved seed supplied nationally increased over time, farmers' use of purchased seeds in 2011 covered an average of only 5.6 per cent of cropped area, with a high of 28 per cent for maize. Most farmers still rely on farmer-to-farmer exchanges or saved seed, even for improved varieties (Belay 2004; Berhanu et al. 2009). Improved seed in this chapter refers to seed that is bred in conventional systems for particularly desired characteristics, such as drought tolerance, disease resistance, short maturing and/or more productive cropping.

The seed system in Ethiopia has two broad constituents, namely formal and informal systems. Each of the systems play a key roles in the development, multiplication, processing, storage, distribution and marketing of seeds in the country.

The formal seed system dominated by the public sector: This is mainly a government-supported system. Several public institutions are involved in it and it has a legal grounding. The main actors of the formal system include National Agricultural Research Systems (NARS), the Ministry of Agriculture (MoA) and the Ethiopian Seed Enterprise (ESE) (see Spielman et al. 2011). Recently, decentralized regional seed enterprises (RSEs) were also established as public seed enterprises (Amhara Seed Enterprise-ASE, Oromiya Seed Enterprise-OSE, and Southern Nations Nationalities and Peoples Region Seed Enterprise, SRSE). These agencies have interdependent roles in the seed system. NARS is responsible for variety development and supply of initial seeds, while ESE and RSEs are involved in mass production of improved seeds. MoA is also involved in variety release, multiplication, certification and distribution of seeds in the country. Private seed growers and other farmer organizations such as unions and cooperatives also play key roles in multiplication and distribution of different seeds. These formal systems are guided by a policy framework for agricultural research and technology generation. It describes legal procedures, such as variety release, intellectual property rights, certification programmes, seed standards, and contract laws and enforcement. These are important to formalize the seed system and determine the quantity, quality and cost of seeds passing through the seed system (Maredia et al. 2000).

So far, NARS has released 960 varieties of 114 different types of crops up until 2014 (MoA 2014). Among these, cereal, pulse and oil crops accounted

for about 36, 19 and 9 per cent respectively. ESE alone was able to produce 111 different seeds of just 26 different crop varieties in 2009. Seed multiplication by ESE mainly focused on two cereal crops (wheat and maize) and annual supply of certified seed by the enterprise does not exceed 20,000 tons (Marja et al. 2008). Wheat and hybrid maize constitute about 85 per cent of the total output of the enterprise. However, the annual average seed requirement for cereals, pulses and oilseeds is estimated to be over 400,000 tons (CSA reports 2005–2015a, b).

The role of the private sector in the seed industry in Ethiopia is rather weak. Following market reforms in the mid-1990s, seed production and distribution were opened to the private sector. The public sector, including the regional extension and input supply systems, still accounts for 80 per cent of total sales of improved seeds. In 2008, eleven firms were active in seed production, although most of them were involved specifically in hybrid maize seed primarily as subcontractors of Ethiopian Seed Enterprise (ESE). Despite the lucrative potential of the hybrid maize seed market, approximately 60 per cent of maize seed supply was still managed directly by the public sector, with an additional 10 per cent of firms serving as subcontractors to the public sector. Firms operating independently of the public sector's seed production system cover only 30 per cent of maize seed supply.

The informal seed system is the dominant system: This system is not regulated by government policies. Instead, it is implemented by farmers themselves and is highly localized. According to Cromwell et al. (1992), five key features distinguish the informal from the formal system; the informal system is traditional, semi-structured, operates at individual community level, uses a wide range of exchange mechanisms, and usually deals with the small quantities of seeds often demanded by farmers. In the context of Ethiopia, this system is extremely important for seed security, for the bulk of seed in the country is usually supplied via the informal system. About 60–70 per cent of seed used by Ethiopian smallholder farmers is saved on-farm and exchanged among farmers, and the remaining 20–30 per cent is borrowed or purchased locally (Belay 2004). The informal seed system (either self-saved or farmer-to-farmer exchange) accounts for 96 per cent of the seed used by smallholder farmers (CSA 2011), while the share of improved seed is about 4 per cent. The majority of farmers rely on the informal seed supply system for the following main reasons. The informal system is relatively cheap and readily available in the farmers' villages just at the time the seed is needed; it allows use of seeds after testing on primary-adopter farmers; and it is a more reliable and sustainable system than the formal one.

To summarize, Ethiopia's seed system continues to be dominated by the informal sector. The formal seed system has not been able to cope with the

demands and it is dominated by the public sector. Although the government implemented several policies to entice the private sector as an engine for the growth of the Ethiopian economy (including a plant breeder's act that came into effect in 2006), private investment in Ethiopia's seed market has been severely constrained by several entry barriers. Spielman (2008) identified three main barriers: (1) the private seed enterprises face high costs of building distribution networks that must compete with the state's own distribution system that ties seed with fertilizer and credit (World Bank 2006); (2) the private enterprises must contend with the similarly high costs of navigating the regulatory system, accessing financing from the formal banking sector and meeting the stringent collateral requirements; and (3) private investment has also been thwarted by relatively low nominal prices for seed sold by ESE, despite the possibility of bringing these prices into closer alignment with international benchmarks that price hybrid seed at about a 10:1 ratio over the grain price (versus the 5:1 used in Ethiopia).

FERTILIZERS The experiences of the fertilizer sector are important in highlighting the implications of liberalization of prices, removal of state subsidies, dismantling of state monopolies and encouragement of private investment. By 1996, the introduction of such policies opened up the fertilizer market substantially, encouraging several private firms to import fertilizer, and creating opportunities for the entry of 67 private wholesalers and 2,300 retailers, representing a significant share of the domestic market (Spielman 2008).

This promising opportunity could not, however, continue after 1999 as the independent private sector exited the fertilizer market. The share of private firms in the import market dropped from 33 per cent in 1995 to zero in 1999. Since then, the Agricultural Input Supply Enterprise (AISE) has taken the lion's share and, more recently, cooperative unions have been entering the market. Experiences in the wholesale and retail ends of the market were similar. The public sector accounted for over 70 per cent of distribution while the private dealers, mainly affiliated to the ruling parties, accounted for only 7 per cent of the nationwide sales as of 2004 (DSA 2006; EEA/EEPRI 2006). Since 2005, cooperative unions have taken up increasing roles in importation, wholesaling and retailing. Ultimately, the government expects the cooperative unions and their member cooperatives to take the lion's share of fertilizer distribution in the future.

One of the major reasons for the decline in private sector participation in fertilizer markets is the difficulties inherent in the bureaucratic procedures and criteria needed in the import process. For importing fertilizer, the investor should obtain a licence from the government which is allocated through a tendering process, and the fertilizer is imported in lots of 25,000 tons. The importer often requires financing, given the sheer size of a single shipment.

Yet while a private buyer is required to deposit 100 per cent of the value of the fertilizer consignment at the time a credit line is opened, the AISE and cooperative unions have the privilege of being able to settle the import with collateral requirements. Information on estimation of demand and the distribution of fertilizer is also problematic. Estimates of demand are compiled through official channels and aggregated to the national level, as in the case of seed. Importers respond to official demand estimates and organize distribution through the regional BoA or cooperatives (DSA 2006). Like the importation process, this process tends to favour those firms with better access to capital markets and experience in navigating the regulatory and administrative systems of the country, at both the federal and regional levels. Overall, lack of supportive financial systems and a distorted playing field in the fertilizer sector have been major challenges. This suggests the need for further measures to introduce stronger competitiveness policies to revitalize private investment in importing, wholesaling and retailing of fertilizer.

PESTICIDES The incidence of diseases, insect and weeds is a serious problem for the crop sector in the country. According to CSA (2011) reports, the estimated area of cultivated land treated with pesticides increased from 1.31 million hectares in 2005 to 2.24 million hectares in 2011. This implies that the extent of crop damage due to diseases, pests and weeds expanded from 12 to 17 per cent of the total cultivated land of the country, with the high of 22 per cent for cereals, to which the country allocated about 80 per cent of the total cultivated land over the same period. In the case of high-value crops (such as horticulture), the damage grew to 7 per cent in 2011 from 2 per cent in 2005. The damage affects most of the horticultural crops grown in the country. This problem is further aggravated by shortage of appropriate pesticides to manage it. Most horticulture crops in the Amhara region, for instance, are highly affected by disease and insect pests of various types. Diseases affecting horticultural crops such as pepper and citrus are very critical in the region.

Pesticides are usually supplied by local traders. Enforcing safety and control mechanisms is a challenge. According to local informants, supply of low-quality and even expired pesticides have been observed. The focus-group discussants also indicated that the prescription of pesticides to control pests is not based on the types of pests occurring on the farm but rather on the types of crops. The farmers purchase pesticides directly from traders without consulting the agricultural experts. This leads to low effectiveness of pesticides and loss of crops. Furthermore, the discussants disclosed that most of the chemical traders lack the required knowledge to advise on handling chemicals.

Input use and supply systems in the livestock sector Livestock production is an integral part of the smallholder agricultural production

system. Official estimates indicate that the country's smallholder farmers have about 56.71 million cattle, 29.33 million sheep, 29.11 million goats, 56.87 million poultry birds and 10.66 million equines – of which 1.16 million are camels (this is excluding the livestock population in pastoral areas of the Afar and Somali regions) (CSA 2015b). The country also has 5.89 million beehives, of which more than 96 per cent are traditional and fewer than 4 per cent are intermediate and modern hives. According to CSA (ibid.), 3.07 billion litres of cow milk, 233.85 million litres of camel milk, 106.57 million eggs and 48.71 million kilograms of honey were produced in 2014/15. Earlier estimates indicated that the livestock sector contributes about 12–16 per cent of the country's GDP and 40 per cent of agricultural GDP, excluding the values of draught power, transport and manure, and contributes to the livelihoods of about 60–70 per cent of the Ethiopian population (Halderman 2004). A study by Behnke and Metaferia (2011) shows that the value of the animal draught power input into arable production is about a quarter (26.4 per cent) of the value of annual crop production, and if the value of draught power services is included, the sector contributes up to 45 per cent of agricultural GDP.

The major inputs for livestock development include animal genetic resources, feed and forage, veterinary medicines and services, machinery and equipment and utensils, as well as knowledge. The experience so far has been that the sector has seen the supply of improved animal genetic resources for dairy development, sheep production (meat and wool) and improved poultry (broiler and egg production), the supply of bee colonies, provision of forage seeds, planting materials and dairy goats, provision of processing equipment and utensils (dairy and apiculture), and drug supply and vaccination services. Government has been the main supplier of most of these inputs and services. Limited credit facilities to support livestock asset accumulation and development have been provided by microfinance institutions, food security projects, small-scale micro-enterprises, and NGOs. The contribution of the private sector in livestock inputs has been limited to supplies of veterinary drugs and services, roughage and concentrate feeds, and processing equipment and utensils.

Recent trends show that there is an encouraging move to involve the private sector in input supplies such as production of beehives. Owing to the recent increase in demand for live animals and animal products in the domestic and export markets, there has been a renewed interest in promoting market-oriented livestock production. As a result, efforts are being made to engage farmers and pastoralists in more market-oriented livestock production in areas where the resources offer such opportunities. Examples of this include apiculture production, small-ruminants breeding and fattening, cattle fattening, poultry production, and dairy production. Microfinance, small-scale and micro-enterprises, NGOs and the women's affairs office are involved in these activities, with limited engagement from the Office of Agriculture.

For the smallholder farmers, livestock is an essential component. Livestock provides nutritious products (milk, meat, honey and eggs) and by-products (butter, cheese, yogurt and whey). It also plays a crucial role in food security during good and bad times. Livestock provides a source of power for crop cultivation, means of transportation, cash income, and manure (organic fertilizer) for farmland and dung as a source of fuel. It also has high social and cultural values in rural society, serving as a means of wealth accumulation and an indicator of social status.

Major challenges facing the livestock sector include poor market integration and low productivity levels. Poor market orientation of the livestock sector has undermined the role it can play in contributing to the national economy. For instance, the extensive pastoral systems have been largely ignored and marginalized despite their riches in livestock. The productivity of the livestock is generally poor. Average yields per animal slaughtered or milked are estimated to be 105 kg of beef, 10 kg of mutton and 213 kg of cow milk. Egg production from indigenous poultry is between 40 and 60 with an average egg weight of 45 grams. At present the per capita consumption of milk and meat is estimated at 19 litres and 8 kg respectively, making Ethiopia the least even in its consumption levels among its neighbouring countries. Based on these estimates, the annual per capita consumption of meat is 43 per cent below the African average of 14 kg. The growing demands from urbanization are also both an opportunity and a challenge for the farming system.

ANIMAL BREEDS Livestock production in Ethiopia heavily depends on indigenous genetic resources. The composition of indigenous, hybrid and exotic breeds for cattle is 98.66, 1.19 and 0.14 per cent, for sheep 99.78, 0.17 and 0.05 per cent, for poultry 95.86, 2.79 and 1.35 per cent respectively, while 99.96 per cent of goats are indigenous breeds (CSA 2015b). This implies that more than 95 per cent of the Ethiopian livestock population is indigenous and less than 5 per cent are hybrid and exotic breeds.

Cattle, camels, goats and sheep are the main dairy animals in the country. Cattle made the largest contribution (90.27 per cent) to the total national annual milk output, followed by camels (6.2 per cent), sheep (1.78 per cent) and goats (1.75 per cent) in 2014 (FAOSTAT 2017). Indigenous breeds have poor production and reproductive performance. For example, in 2010/11 the average daily milk production and lactation period for a local cow in rural sedentary areas of the country was estimated at 1.85 litres and six months (CSA 2011). The per capita milk consumption was only about 16 kg/year, which is much lower than African and world per capita averages of 27 and 100 kg/year, respectively (FAOSTAT 2009).

The annual rate of increase in milk yield (estimated to be 0.8 per cent) lags behind the increment in human population (about 2.6 per cent per annum)

over 2011–14 (FAOSTAT 2017). Azage (2003) estimated that if the current level of milk production was maintained, then about 6 million tons of additional milk (a 4 per cent increment in total milk production) would be required per annum to feed the increasing human population and narrow the gap in milk supply and demand. Thus, the country has been spending foreign currency to import dairy products from abroad to meet domestic demand. For instance, the country spent about US\$3.1 million in 2001 for this purpose, and this number increased to US\$9.3 million in 2008 (Haile 2009). The level of foreign exchange earnings from livestock and livestock products is also much lower than would be expected, given the size of the livestock population (Kedija et al. 2008).

On the other hand, Ethiopia has a huge potential for dairy development. The large and diverse livestock genetic resources, the existence of diverse agro-ecologies suitable for dairy production, and increasing domestic demand for milk and milk products suggest that there is potential for dairy development in the country. However, dairy development has been hampered by multifaceted, production-system-specific constraints related to genotype, feed resources and feeding systems, access to services and inputs, low adoption of improved technologies and marketing, and absence of clear policy support to the sector.

FEEDS AND FORAGES The dominant livestock management systems in Ethiopia is low-input, low-output husbandry. Green fodder/pasture (56.23 per cent) and crop residues (30.06 per cent) are the main feed types available in the country (CSA 2015b). The feed resources in the mixed-crop/livestock production areas are natural pastures, crop residues and, to a lesser extent, improved forage, concentrates and non-conventional feeds. Natural pasture is the primary feed source for livestock, and is copious during rainy season. In certain areas, it is harvested during wet season and conserved for dry season (Dereje et al. 2014; Feyissa et al. 2014; Diriba et al. 2014). Crop residues are the second-most abundant feed source in the country, and include straw/stover of *teff*, barley, wheat, sorghum and maize (Dereje et al. 2014; Azage et al. 2013), and legume residues such as fava bean and field pea (Abate et al. 2012). During harvesting seasons, animals are fed on crop stubble. In some areas, improved forage is cultivated and fed to dairy cows to enhance milk production, though this is limited in practice (ibid.). Non-conventional feeds such as weeds and brewer's grains, a by-product of local beer (*tella*), are also fed to livestock (Feyissa et al. 2014). Agro-industrial byproducts including wheat bran, oil cake and molasses are available only to farmers close to urban areas, but are unaffordable to most of them for frequent purchase (Diriba et al. 2014; Yami et al. 2012). The main feed types available for urban dairies are crop residue, hay and agro-industrial by-products (Azage et al. 2013).

Free grazing is the most common feeding system in the mixed farming areas (Feyissa et al. 2014; Azage et al. 2013), where animals are grazing on pasture

land, along roads and rivers, and around homesteads. Stall-feeding is dominant in urban dairying and common in some places in the mixed farming system (Belay et al. 2012; Diriba et al. 2014). In some other places, such as the Mieso district of Oromia region, animals are tethered during crop cultivation but freely graze after harvesting season (Kedija et al. 2008). Some farmers mix crop residue with oil cake and wheat bran to improve its palatability and some others provide improved forage and hay to dairy cows and oxen (Belay et al. 2012). Seasonal purchase of concentrates for fattening animals and dairy cows is also common in some places (Feyissa et al. 2014). Although urea supplementation to enhance the intake and nutritional value of crop residues is lacking, salt supplementation is very common (Dereje et al. 2014).

The major constraints on feed availability in mixed farming areas are scarcity of land for forage production and grazing; lack of forage seed and poor extension services; low nutritional value of available feeds, especially during dry season; high price of concentrates; limited finance; and wet-season feed shortage caused by waterlogging of grazing pasture and intensive cropping (Abate et al. 2012; Diriba et al. 2014).

ANIMAL HEALTH SERVICES Incidence of animal diseases may cause total loss (death of animals) and/or low productivity due to loss of weight, slowdown in growth, poor fertility performance, and decrease in power of animals. It is thus essential to maintain animal health condition through providing various health inputs and support services. The animal health inputs and services applied in Ethiopia encompass: preventive services and vaccinations; education/extension (including public health education); regulatory services to control occurrence of new diseases; clinical services (including diagnosis and treatment of sick animals); supply of livestock drugs; meat inspection services at abattoirs; and public health in relation to zoonotic and food-borne disease control, hygiene, food and feed safety, and the environment. In 2014/15, the estimated number of animals vaccinated (against anthrax, blackleg, pleural pneumonia, haemorrhagic septicaemia, and others) in the rural areas of the country was about 43.48 million, of which 70.4 per cent were cattle, followed by goats (15.5 per cent), sheep (13.9 per cent) and camels (0.24 per cent) (CSA 2015b). Different types of disease afflicted about 50.84 million animals in the same period, of which only 26.9 per cent were treated. Cattle comprised about 43.1 per cent of the total treated animals and substantial numbers of sheep, goats and poultry were treated as well.

The government is the major animal health service provider in Ethiopia. There is also limited involvement of the private sector and NGOs in the provision of drugs and animal health services. A few years ago, there were attempts to promote privatized veterinary services, but these have not effectively materialized. The public sector involvement and support have often been associated

with disease surveillance, eradication campaigns and vaccine production, drug and vaccine quality control, quarantine and food hygiene and inspection measures. Eradication and control programmes for killer diseases call for national and international efforts, and surveillance and control measures often require national coverage, including remote and inaccessible areas. However, the public sector has been limited by lack of adequate resources to deliver the services. Shortage of manpower (quantity and quality), lack of transport, availability of drugs and other supplies, poor information, communication and reporting systems, and limited finance are some of the reasons frequently raised by the professionals in the field (Azage 2003; Belay et al. 2012). The major complaint and dissatisfaction of livestock keepers is unavailability of professionals, lack of communication, unavailability or shortage of drugs, poor diagnostic capability, and lack of confidence in the quality of the service (Diriba et al. 2014).

Public or private service provisions could include diagnostic services, vaccination, vector control and treatment. However, private sector animal health service provision is limited in Ethiopia owing to a number of factors. These include lack of capital, unwillingness of livestock keepers to pay, affordability of drugs and services, poor accessibility, high transportation costs, alternative cheap supplies of drugs from illegal markets, NGO and public sector provision of drugs and services at subsidized rates, and isolated herds.

Marketing systems of agricultural products of smallholder farmers in Ethiopia

One of the main reasons for low productivity of smallholder farmers in Ethiopia is lack of markets to absorb even the small amount of marketable surplus of their products. This is mainly because most of the farmers living in the same village usually produce similar products to sell at the same local market. This not only forces farmers to sell their products at lower prices, but also negatively affects future food production and consumption as farmers plan production based mainly on the price incentives of the previous year's market. According to Melkamu et al. (2015), the main reasons for the low prices of farmers' products include: asymmetric market information through illegal brokers distorting the marketing process (misuse of supply, demand and price information in favour of traders); lack of market diversity (excessive supply of similar products by most farmers to the same local markets); and lack of agro- processing industries.

Studies also indicated that there is a high post-harvest loss of agricultural products in the country, ranging from 25 to 30 per cent, and the loss is even higher in the case of perishable crops (fruits and vegetables) and animal products (such as milk). The losses occur at farm level during harvest and transport and in the store. Lack of appropriate technology (cold storage), lack of food processing units and poor market linkage and information delivery

systems among smallholder farmers and potential buyers/agribusiness firms are factors that contribute to the losses.

The development of the agro-processing industry in Ethiopia is very slow. The establishment of the agro-processing industry and cold storage is a capital-intensive investment and requires a continuous supply of inputs that may not be fulfilled at this developmental stage. Thus, large-scale, high-value food processing that uses the smallholder products scarcely exists (except in the brewery sector). Instead, small-scale, home-made processors (for juices, and processing potato to chips) are common in urban areas (ibid.). Lack of vibrant and high-value processing plants means that opportunities to replace imports, create a profitable market for the smallholder producers and generate productive employment are severely undermined. It also means that the horticulture and dairy sectors are risky for farmers as their products are highly perishable. They cannot be stored for a long period of time without quality deterioration. Hence, they have to be sold fresh immediately to the market or they have to be processed.

The capacity and potential of smallholder farmers to supply agricultural products to industries is not without problems. If we take the single case of the relationship between cattle-rearing farmers and a meat processing company (called Elfora Kombolcha Agro-Processing Plant) in the Kalu district of Amhara region, it will be easy to understand the problem of livestock marketing in Ethiopia. Since there is no commercialized rearing of cattle in this area, the supply of cattle is not sufficient for the company in terms of both quantity and quality. As a simple indicator, the cattle will have good-quality raw meat if supplied to the company at a younger age (two to three) and well fattened for the purpose of meat production. However, farmers in Ethiopia usually supply their cattle to the meat processing company not only when they are older (i.e. over five) but after having worked for several years as draught power for ploughing. This makes processed meat very poor quality and incompatible with the world market.

Institutional support services for agricultural input supply and output marketing

The involvement of the private sector in Ethiopia in agricultural service provision is limited. The government almost exclusively provides agricultural extension services. In an apparent attempt to solve some of the coordination problems in service delivery, the extension programmes coordinate the provision of credit and the supply of inputs (especially improved seeds, agro-chemicals and fertilizers). The role of farmer cooperatives in service delivery is also increasing over time. Where farmer cooperatives are strong, the extension service works closely with the cooperatives. Whether such arrangements are effective or not is an empirical issue.

Credit services Since 1994, the regional governments in Ethiopia has used a 100 per cent credit guarantee scheme to stimulate the uptake of the PADETES improved seed–fertilizer packages. Under this system, about 90 per cent of fertilizer is delivered on credit at below-market interest rates, displacing what had largely been retail sales from the private sector (including a substantial share on a cash basis). In order to finance the packages, credit is extended to farmers by the state-owned Commercial Bank of Ethiopia, through cooperatives, local government offices and, more recently, microfinance institutions (MFIs) and one cooperative bank. Cooperatives have gradually assumed responsibility for part of the guaranteed credit programme, which has reached some four million farmers with guaranteed credit of nearly US\$70 million in recent years. The financial products on offer, and their associated interest rates, are generally limited to seed and fertilizer purchases, animal fattening, beekeeping and several other recognized investments.

Loan recovery, using extension agents and a degree of coercion by local administrative officials, was generally successful until the collapse of maize prices in 2001 and the subsequent drought. In Oromia region, for example, recoveries had averaged above 80 per cent up to 2001, but this figure dropped to 60 per cent in 2002, forcing a major rescheduling of loans. This has resulted in high fiscal costs and risks associated with the loan guarantee programme. The write-off of loan guarantees amounted to Ethiopian birr (ETB) 84 million in 2001, but by 2005 liabilities had again accumulated, reaching ETB 183 million (DSA 2006). Also in 2005, the Oromia region was obliged to pay approximately ETB 84 million to the Commercial Bank of Ethiopia to honour its guarantees for the previous three-year time period. The guarantee thus becomes a subsidy that is not accounted for in government budgeting.

Continued dependence on public guarantees and write-offs, below-market interest rates and loan recovery by public extension agents and local administration is likely to hinder the emergence of competitive financial institutions in rural areas.

Extension services Extension services in Ethiopia were first introduced in the 1950s. Since the 1980s, Ethiopia's extension system has followed a 'training and visit system' that was introduced under the PADETES programme. Agricultural extension services in the context of Ethiopia mainly focus on improved seeds, fertilizers and credit for the smallholders. Agricultural extension in Ethiopia has traditionally been financed and provided almost entirely by the public sector. The current programme has expanded the extension coverage in Ethiopia and claims to reach around four million farmers (EEA/EEPRI 2006). It is expected that this coverage will increase further. Since 2004, some 50,000 new extension agents (along with 15,000 existing agents) have been inducted into training programmes and are being deployed throughout the

country, thus expanding the size of the public extension staff fourfold. In addition, Farmer Training Centres (FTCs) are being constructed in each *kebele* (the smallest administrative unit in Ethiopia), and the total number of FTCs reached 18,000 by the end of 2008. The FTCs are designed as local-level strategic locations for farmers to receive information, training, demonstrations and advisory services, and include both classroom and demonstration services. Each FTC is staffed with three development agents (DAs) (one each in the areas of crops, livestock and natural resource management) and supported by a peripatetic DA covering several FTCs and trained in cooperatives management or a related field. Nowadays, in some of the irrigation potential districts, the programme allows one additional irrigation expert to be assigned at *kebele* level aiming to promote irrigation-oriented horticulture production in the region, although there is still a lack of horticulture graduates (who can be technically and professionally responsible for horticultural activities) assigned at *kebele* level. Each DA is expected to train 120 farmers per year in his/her field of specialization through a broad range of demand-responsive extension and short-term training services.

This programme in Ethiopia represents a significant public investment in extension, amounting to more than US\$50 million annually (about 2 per cent of agricultural GDP). However, little has been done in terms of evaluation of the programme impacts. The results of a few surveys as regards impact on productivity and poverty have been mixed. Although many farmers seem to have initially adopted the packages promoted by the extension system, about a third of the farmers who have hosted a package had discontinued its use; while poor extension services were the main reason for non-adoption (Bonger et al. 2004; EEA/EEPRI 2006). Moreover, extension effectiveness in Ethiopia continues to be measured in terms of targets for physical input use, at the expense of emphasizing the efficiency and profitability of input use. In fact, most extension workers are engaged in distributing seed, fertilizer and credit packages. This hampers the provision of technical advice (EEA/EEPRI 2006).

The hierarchical nature of the extension system does little to encourage and integrate the inherent resourcefulness and knowledge of the farmers and rural communities (Berhanu et al. 2006). In addition, continued imposition of targets from the top and weak local capacity have not permitted the emergence of a dynamic, demand-driven extension systems. Despite such limitations, agricultural extension services play an effective role in enabling smallholders to use more inputs and attain higher crop productivity. Smallholder farmers who participated in the extension programme used fertilizer more intensively and also attained significantly higher crop productivity per hectare (Berhanu et al. 2009). Nevertheless, the marketing extension component is rather weak in facilitating farmers' participation in crop markets. There is a need to rethink the current agricultural extension system to incorporate the marketing issues

and continue its role in improving agricultural productivity through training and transferring knowledge and information to the smallholder farmers.

These challenges are recognized and there are several changes being introduced to address these deficiencies. To get beyond a focus on cereals, packages have been developed to support other crop and livestock enterprises, improve post-harvest technology, and encourage natural resource management. Recognizing the diversity of smallholder farming systems in Ethiopia, classifications have been developed to divide the country into several distinct agro-ecological zones, which have been used in the development of more appropriate zone-specific packages (Ibrahim 2004). Input distribution is being shifted away from extension to input supply offices and cooperatives, thus freeing extension agents to provide more technical advice. There are moves being made to strengthen and diversify the curriculum provided by the twenty-five Agricultural Technical and Vocational Education and Training (ATVET) colleges that are responsible for preparing development agents. The extension programme also attempted to bring about an attitudinal change in farmers through awareness creation – for example, encouraging them to shift their production pattern from long-maturing, traditional crops to short-maturing, high-value crops so that they can earn a high farm income from a plot of land.

The role of cooperatives in agricultural input supply and output marketing

In Ethiopia, cooperatives have been organized in a modern way since the early 1950s. Currently there are 60,126 Primary Cooperatives with 9,393,201 farmer members, 326 cooperative unions comprising 8,932 Primary Cooperatives, and four Federal Cooperative Unions (FCA 2014). They have capital of about 11.3 billion birr and cash deposited of more than 5.2 billion birr. These farmers' organizations are involved mainly in agricultural sectors and financial sectors (saving and credit cooperatives). The existence of such large numbers of farmers' organizations can be taken as a good opportunity for smallholder agriculture to transform via addressing the constraints (e.g. inadequacy and untimely delivery of inputs, shortage of finance/capital, weak bargaining power, poor access to market information, inaccessibility of improved technologies and infrastructures) and efficient and sustainable use of unexploited potential in the country (e.g. potential markets for agricultural outputs indicated by an increasing presence of food processing companies, and the collective resources created by cooperatives and unions – capital, land, productive labour and indigenous knowledge and experience of farming, helping build the financial capacity, bargaining power and competitiveness of smallholders both in domestic and export markets).

For farmers' organizations to play a prominent role in the transformation of smallholder agriculture it is essential to provide supportive policy and

institutional frameworks, as well as build their skills and technical capacities until they are capable of fulfilling their functions on their own. They can potentially play important roles in rural finance, agricultural input supply, agricultural output marketing (market linkage between farmers and potential buyers), and value-adding activities (agro-food processing industries). Farmer organizations are also indispensable in the management of irrigation schemes, which are expanding rapidly in the country (see also Chapter 3), and in the development of the horticulture sector. Both the focus group discussants and key informants in the horticulture industry argued that, if they are strengthened, farmers' organizations could be serving as agents that can facilitate smooth exchange of inputs between sources and farmers.

Conclusion

Although the demand of smallholder agriculture for improved inputs and support services in Ethiopia is high, the supply is very limited. The question in the case of Ethiopia is how the private sector can participate in the government-dominated system that is not able to supply enough inputs and services to meet the demand in the country. The challenges are both institutional and related to profitability. For instance, control of breeder seed together with the high costs of finance for private companies have been identified as the main instruments of the government for controlling seed production, distribution and price-setting, which hampers investment and the development of business strategies of Ethiopian seed enterprises. Since all Ethiopian (public and private) seed companies are dependent on public research institutions for the supply of breeder seed, they are obliged to comply with the conditions that come with the provision of the breeder seed – i.e. the sale of all produced seed to the government at prices that are determined by the government. Unions and cooperatives then distribute the seed on behalf of the government. The single distribution channel often leads to seed being mixed up along the value chain and means that farmers can choose the variety they want to plant but not the producer of the seed, which prevents them holding seed producers accountable if the seed fails. To put it differently, seed producers have no incentive to improve seed quality as better quality is not rewarded, since prices are the same for all producers and low quality cannot be penalized. Thus, to ensure supply of improved agricultural inputs, contributions from the private sector will be needed. Even if the new regional seed enterprises expand and optimize their production over the coming years, it is unlikely that they can satisfy the demand for seed of all farmers in the country. Since there is no strong incentive in the current production system for seed producers to make their business more independent of the government, well-designed market liberalization and incremental institutional changes are required to provide incentives for

the private sector to increase seed production and diversity in the product portfolio and to improve seed quality.

The risks involved in agricultural product marketing are the other important problem that has to be overcome, mainly through better marketing links, such as arranging contract farming schemes between producers and potential buyers. The contract farming should be legal so that it can be enforced and controlled by the law. In Ethiopia, an informal contractual system is common. In this system of marketing, producers and buyers sign a contract agreement in advance of crop production, which governs both partners in terms of quantity, quality, price and mode of delivery. This helps not only avoid brokers from the market chain who misuse the information to maximize their benefits at the expense of farmers, but also stimulates agricultural production to become demand driven and market oriented as the buyers provide accurate market information from the demand side.

Farmers' organizations (cooperatives and unions) could play an important role in establishing appropriate market linkage and information delivery systems between farmers and potential buyers. This will enable smallholder farmers to have: bargaining power; better access to different support services (inputs, credits, extension and training); secured markets for their products (enhancing competitiveness in input and output markets, including government auctions); the ability to minimize tax in selling their produce; and more power to control traders' supply of lower-quality seeds and pesticides at expensive prices. But the government (through the Cooperative Promotion Agency) should work on developing the sense of belonging of each member to their cooperative and registering the organization so that it acquires a Taxpayer Identification Number (TIN) and can also participate in any legal government auctions for both selling products and purchasing of inputs.

The government has to take the initiative in mobilizing and strengthening existing cooperatives and unions to play a vital role in linking producers and potential buyers. They should also capitalize their economies of scale through being engaged in agro-processing and other value-adding activities. Thus, as intermediaries, would collect agricultural products directly from smallholders and then sell these products collectively by looking for potential (domestic and export) markets. In doing so, these organizations should prepare a plan for smallholders ahead of time in terms of what, how and when to produce through consulting the respective potential buyers and smallholders.

To this end, farmer cooperatives are expected to play a pivotal role in smallholders' capacity-building, mainly through bridging the following four gaps that have existed in the rural areas: rural finance, agricultural input supply, agricultural output marketing (market linkage between farmers and potential buyers), and agro-food processing industries (value-adding activities).

References

- Abate, D., S. Belete, T. Wegi, S. Usman, J. Wamatu and A. Duncan (2012) 'Characterization of the livestock production systems and the potential of feed-based interventions for improving livestock productivity in Sinana District, Bale highlands', Nairobi: International Livestock Research Institute (ILRI).
- Azage Tegegne (2003) 'Financing market-oriented milk development: the case of Ada'a-Liben District Milk and Milk Products Marketing Association, Ethiopia', *Urban Agriculture Magazine*, 9: 25–7.
- Azage Tegegne, Berhanu Gebremedhin, D. Hoekstra, Berhanu Belay and Yosef Mekasha (2013) 'Smallholder dairy production and marketing systems in Ethiopia: IPMS experiences and opportunities for market-oriented development', *Improving Productivity and Market Success of Ethiopian Farmers Project Working Paper 31*, International Food Policy Research Institute.
- Behnke, R. and F. Metaferia (2011) 'The contribution of livestock to the Ethiopian economy – Part II. IGAD Livestock Policy Initiative', IGAD LPI Working Paper no. 02-11, Djibouti: IGAD, www.igad-lpi.org/publication.
- Belay Duguma, Azage Tegegne and B. Hegde (2012) 'Smallholder livestock production system in Dandi District, Oromia Regional State, Central Ethiopia', *Global Veterinaria*, 8(5): 472–9.
- Belay, S. (2004) 'The seed regulations and standards of Ethiopia: the way forward', Eastern and Central Africa Program for Agricultural Policy Analysis (ECAPAPA) Report, Entebbe.
- Berhanu Gebremedhin, D. Hoekstra and Azage Tegegne (2006) 'Commercialization of Ethiopian agriculture: extension services from input supplier to knowledge broker and facilitator', Working Paper 1, Nairobi: International Livestock Research Institute.
- Berhanu Gebremedhin, Moti Jaleta and D. Hoekstra (2009) 'Smallholders, institutional services, and commercial transformation in Ethiopia', *Agricultural Economics*, 40(1): 773–87.
- Bonger, T., G. Ayele and T. Kumsa (2004) 'Agricultural extension, adoption and diffusion in Ethiopia', Ethiopian Development Research Institute (EDRI) Research Report no.1, Addis Ababa: EDRI.
- Byerlee, D., D. J. Spielman, D. Alemu and M. Gautam (2007) 'Policies to promote cereal intensification in Ethiopia: a review of evidence and experience', IFPRI discussion paper no. 707, Washington, DC: IFPRI.
- Crawford, E., H. J. Kelly, Mulat Demeke and J. Jeje (2003) 'Promoting high input maize technologies in Africa: the Sasakawa Global 2000 Experience in Ethiopia and Mozambique', *Food Policy*, 28(4): 335–48.
- Cromwell, E., E. Friis-Hansen and M. Turner (1992) 'The seed sector in developing countries: a framework for performance analysis', Working Paper 65, London: Overseas Development Institute.
- CSA (Central Statistics Agency) (2011) 'Agricultural sample survey 2010/2011', vol. II: 'Report on livestock and livestock characteristics', Statistical Bulletin, Addis Ababa: Central Statistical Agency of Ethiopia.
- (2015a) A Series of Agriculture Sample Survey 2004/05–2014/15: Report on Area and Production (Private Peasant Holdings, Meher Season), Statistical Bulletin, Addis Ababa: Central Statistical Agency of Ethiopia.
- (2015b) A Series of Agriculture Sample Survey 2004/05–2014/15: Report on Crop and Livestock Product Utilization (Private Peasant Holdings, Meher Season), Statistical Bulletin, Addis Ababa: Central Statistical Agency of Ethiopia.

- Dereje Duressa, Debela Kenea, Wakgari Keba, Zelalem Desta, Gutema Berki, Gerba Leta and Adugna Tolera (2014) 'Assessment of livestock production system and feed resources availability in three villages of Diga District Ethiopia', Addis Ababa: International Livestock Research Institute.
- Diriba Geleti, Shimeis Mengistu, Ashenafi Mekonnen, Fikade Tessema, Melese Mulugeta, Shiwanzizaw Wolde, Tasfaye Abiso, Adugna Tolera and A. Duncan (2014) 'Assessment of livestock feed production and utilization systems and analysis of feed value chain in Lemo District, Ethiopia', Addis Ababa: International Livestock Research Institute.
- Dorward, A. R. (1999) 'Farm size and productivity in Malawian smallholder agriculture', *Journal of Development Studies*, 35(5): 141–61.
- DSA (Development Studies Associates) (2006) 'Study on improving the efficiency of input markets', Addis Ababa: Ministry of Agriculture and Rural Development, Federal Democratic Republic of Ethiopia.
- EEA/EEPRI (Ethiopian Economic Association/Ethiopian Economic Policy Research Institute) (2006) 'Evaluation of the Ethiopian agricultural extension with particular emphasis on the Participatory Demonstration and Training Extension System (PADETES)', Addis Ababa: EEA/EEPRI.
- FAO (2006) *Promoting the Growth and Development of Smallholder Seed Enterprises for Food Security Crops: Case studies from Brazil, Cote d'Ivoire and India*, Rome: Food and Agriculture Organization of the United Nations.
- FAOSTAT (2009) 'FAO Statistical Yearbook', Rome: Food and Agriculture Organization of the United Nations.
- (2017) 'FAOSTAT Main Database', Rome: Food and Agriculture Organization of the United Nations, website accessed 14 February 2017.
- FCA (Federal Cooperative Agency) (2014) 'Annual Report of Federal Cooperative Agency', Addis Ababa.
- Fekede Feyissa, Adugna Tolera, Andnet Deresse, Temesgen Assefa, Diriba Geleti and A. Duncan (2014) 'Assessment of livestock feed production and utilization systems and analysis of feed value chain in Jeldu District', Addis Ababa: International Livestock Research Institute.
- Fentahun, T. and A. Merku (2014) 'Determinants and efficiency of sharecropping in rice production: the case of West Amhara Region, Ethiopia', *Journal of Agricultural Research*, 2(9): 105–17.
- Haile, G. (2009) 'The impact of global economic and financial crises on the Ethiopian dairy industry', Vienna: United Nations Industrial Development Organization.
- Halderman, M. (2004) 'The political economy of pro-poor livestock policy making in Ethiopia', FAO Working Paper no. 19, Rome: FAO.
- Hazell, P., C. Poulton, S. Wiggins and A. Dorward (2007) 'The future of small farms for poverty reduction and growth 2020', Discussion Paper no. 42, Washington, DC: International Food Policy Research Institute.
- Ibrahim, M. (2004) 'Extension experiences in Ethiopia', Unpublished document, Addis Ababa: Ministry of Agriculture and Rural Development Planning Workshop.
- Kedija Hussen, Azage Tegegne, Mohammed Yousef and Berhanu Gebremedhin (2008) 'Cow and camel milk production and marketing in agro-pastoral and mixed crop-livestock systems in Ethiopia', Improving Productivity and Market Success of Ethiopian Farmers Project Working Paper 13, Nairobi: International Livestock Research Institute.
- Kydd, J. and C. Poulton (2000) 'Agricultural liberalization,

- commercialization, and market access problem', in T. Killick, J. Kydd and C. Poulton (eds), *The Rural Poor and the Wider Economy: The Problem of Market Access*, IFAD Rural Poverty 2000 Report, Rome: International Fund for Agricultural Development.
- Lipton, M. (2005) 'Can small farms survive, prosper, or be the key channel to cut mass poverty?', Paper presented at FAO symposium on Agricultural Commercialization and the Small Farmer, 4/5 May, Rome.
- Maredia, M., D. Byerlee and P. Pee (2000) 'Impacts of food crop improvement research: evidence from sub-Saharan Africa', *Food Policy*, 25(5): 531–59.
- Marja, H., Zewdie Bishaw, Abdurahman Beshir and S. Walter (2008) 'Farmers, seeds and varieties', Wageningen International.
- Melkamu, A., T. Fentahun, B. Solomon and A. Belayneh (2015) 'Amhara Region Horticulture Industry Development Strategic Plan (2015–2020)', Unpublished strategy document, Amhara Region Bureau of Agriculture.
- Mesay Yami, T. Haimanot, E. Lemma, B. Begna, T. Etana, J. Wamatu and A. Duncan (2012) 'Characterization of the farming and livestock production systems and the potential for enhancing livestock productivity through improved feeding in Lemu-Bilibilo District, Arsi Highlands, Ethiopia', Nairobi: International Food Policy Research Institute.
- MoA (Ministry of Agriculture) (2014) 'Plant variety release', Protection and Seed Quality Control Directorate Crop Variety Register Issue no. 17, Addis Ababa: Ministry of Agriculture.
- Poulton, C., A. Dorward and J. Kydd (2005) 'The future of small farms: new directions for services, institution, and intermediation', in *The Future of Small Farms: Proceedings of a Research Workshop*, Wye, UK, 26–29 June, Washington, DC: International Food Policy Research Institute, www.ifpri.org/events/seminars/2005/smallfarms/sfproc.asp.
- Poulton, C., J. Kydd and A. Dorward (2006) 'Overcoming market constraints on pro-poor agricultural growth in sub-Saharan Africa', *Development Policy Review*, 24(3): 243–77.
- Spielman, D. (2008) 'Encouraging economic growth in Ethiopia: perspectives on agricultural input markets, agricultural extension and advisory services, and agricultural education and training', Background paper prepared for a study on agriculture and growth in Ethiopia.
- Spielman, D., Dawit Kelemwork and Dawit Alemu (2011) 'Seed, fertilizer, and agricultural extension in Ethiopia', Summary of Ethiopia Strategy Support Program II, Working Paper 20, International Food Policy Research Institute.
- World Bank (2006) 'World Bank support to the Ethiopian seed sector', Unpublished document, Addis Ababa: World Bank

2 | Agricultural Investment Alternatives and the Smallholder Farming Sector

Kassa Teshager Alemu

Introduction

While there are common views about the significance of investment in agriculture in poverty reduction, the type of agricultural structure that should be promoted is debated. In this regard, three perspectives can be identified. The first one believes that investment in large farms that are better integrated with global markets is an effective means to address food security and development (Collier and Dercon 2014); the second maintains that smallholder farmers play a crucial role as agents of economic development and social change (Hazell and Rehman 2014); and the third line of thought promotes the synergy between large-scale and smallholder agricultural investment (Conway 2014). Collier and Dercon (2014) argue that it is still wiser to promote large-scale operations in sub-Saharan Africa because smallholder farming is economically non-viable owing to assets constraints, low yield and labour-intensive farming techniques. They also indicate that large-scale agricultural investment is suitable for technology transfer and expansion of local infrastructure, both of which are crucial to scale up the production (Von Braun and Meinzen-Dick 2009). Critics of this perspective point out that the general trend is that large-scale investors often focus on export products and that their contribution to local food security is insignificant (Castel and Kamara 2009).

Advocates of smallholders argue that small-scale farmers offer several critical advantages to developing countries. Smallholders matter because they exist in huge numbers and exercise strong influence over a whole range of development issues (Hazell and Rehman 2014). It is estimated that 70 per cent of the people living in poverty around the world live in rural areas and depend largely on smallholder agriculture for their livelihood. According to FAO (2012), there are an estimated 500 million family farms across the developed and developing world. These farms produce the food that feeds billions of people, and they represent up to 80 per cent of all farm holdings (ibid.). Given their conditions, smallholders are efficient in their production, create employment for rural people, reduce rural poverty and food insecurity, support vibrant rural economies beyond the agricultural sphere, and help to contain rural–urban migration (Wiggins and Keats 2013; Godfray et al. 2010). Therefore, improving

smallholders' access to credit, agricultural extension and technology and market opportunities is seen as crucial for the development of the sector (Jack 2013; Reardon et al. 2012). However, there are critics of this perspective as well. Gollin (2014), for instance, points out that the sheer size of the sector in itself is not sufficient to justify investment priority. Further evidence is needed about the relative social benefits of investing in smallholders in comparison to other possible sectors of investment.

Other scholars promote the synergy between the two perspectives. Conway (2014) argues that while larger farms do offer economies of scale and better returns on labour, there are several examples of large-scale farms failing in Africa. He makes a case against polarized discussions around food security that focus on 'either/or' options (e.g. small-scale versus large-scale farms) and calls for a move towards 'both/and' discussions that create a space for large-scale and small-scale farmers, thereby harnessing the strengths of each to contribute to global food security and development efforts. This chapter adopts the third perspective.

The chapter provides an exploratory assessment of alternative investment approaches to smallholder agriculture in the context of policies of agricultural modernization in Ethiopia. As Ethiopia has renewed its policy of accommodating large-scale and small-scale agricultural regimes, understanding the different agricultural approaches is crucial. After a brief introduction to a historical perspective on agricultural modernization in Ethiopia, the chapter explores two cases of development intervention approaches that target smallholder farmers. The first case explores a development approach that promotes large-scale and commercial farms as a way of bringing about change and modernization to agriculture. Since 2008, Ethiopia has embarked on policies that promote this approach. Impacts of large-scale agricultural land acquisitions and investments on smallholder agriculture, local food security, employment, technology transfer and access to services are explored. The second case examines the prospect of introducing value-adding marketing support systems to smallholders' agricultural products; in this case potato is the agricultural product. In the latter case, two models of marketing approaches are examined. While one of the models focuses only on creating markets for products that are produced through the traditional (common) practices of smallholder agriculture, the other model provides a comprehensive package of support systems – not only marketing, but also improved seeds and advisory services. Comparisons of the impacts of both marketing systems on value chain, input supply, production output, wholesaling, retailing, processing and added values are presented.

Brief background to agricultural modernization in Ethiopia

In Ethiopia, modernization of agriculture as a policy arena emerged in the 1950s and 1960s (Abenet et al. 1991; Dessalegn 2011). Quite similar to the trends observed elsewhere in Africa, the role of agriculture was primarily conceived as ‘a supplier of resources by being an active and co-equal partner with modern industry’ (Thorbecke 2007: 8). Hence, the policy focus was on large-scale agricultural investment based on commercial principles, and many farms were driven by the private sector focusing predominantly on cash and export crops (Kassahun and Poulton 2014). Such farms were successful, but their impacts on smallholder agriculture are reported to be negligible (Dessalegn 2004). By and large, the country also lacked strategies for smallholder agriculture (EEA 2005).

In the late 1970s and 1980s, large-scale state farms and cooperatives continued to be promoted, but based on socialist ideology, whereby cooperative- and collective-driven agricultural practices were enforced from above. Large commercial farms were nationalized and converted into state and collective farms. The system favoured large-scale and capital-intensive state-owned farming enterprises with credit, subsidies and fiscal incentives, while neglecting smallholders. However, the outcome of such a policy was negative (Abenet et al. 1991).

In 1975, land reform was implemented across the rural areas. Accordingly, land was redistributed among the rural households and 5.6 million smallholder farm families got access to land. The land reform is generally regarded positively as it strived to equitably distribute agricultural land among the rural households. However, these policies did not lead to improved agricultural productivity and agricultural transformation. In fact, the rate of agricultural growth was lower than the growth rate of the population (ibid.). Food insecurity and widespread poverty were evident in many areas of the country. Forced villagization and collective farming programmes, state control over agricultural products and marketing systems, and civil unrest contributed to the stagnation of agricultural production in Ethiopia (Dessalegn 2004). Overall, state policies were sceptical about individual smallholder agriculture and did not provide a comprehensive policy approach.

Since 1991, however, both smallholders and large-scale agriculture have gained renewed political impetus with some level of geographic distinctions between large and small farms. The current policies recognize the role of smallholder farmers mainly in highland areas, who constitute 80 per cent of Ethiopia’s population (Cochrane 2014), while large-scale farms are promoted mainly in lowland areas of the county where land is believed to be available (Lavers 2012). A dominant policy approach of a broad extension system among the smallholders has been implemented (Mulugeta 2014).

During the last decade, there has been an increasing policy drive to promote large-scale commercial farms as a way of modernizing and transforming the

agricultural sector of the country. The important policy instrument here is the land policy. The federal constitution explicitly gives private investors the right to lease land for different purposes (Article 40(6)). The Federal Rural Land Proclamation 456 (FDRE 2005) under Article 5(4) allows investors to acquire rural land for agricultural investment: 'Private investors that engage in agricultural development activities shall have the right to use rural land in accordance with the investment policies and laws at federal and regional levels.'

The purpose of this legal provision is to attract investors who have the capital and technology to invest in small- and large-scale agriculture, mainly in the lowland areas of the country, where availability of infrastructure (roads, communications, etc.) is very limited. Initially, investors were not interested in these lowland areas because of the poor infrastructure and hostile environmental conditions. However, the federal and regional governments offered tax holidays and other incentives to attract domestic and foreign investors (Proclamation 280 (FDRE 2002), Regulation Number 84 (FDRE 2003), and Regulation Number 146 (FDRE 2008)). Currently large numbers of domestic and foreign investors are investing in large-scale agriculture in these lowland areas.

The reason for promoting large-scale agriculture is to create development opportunities such as revenue generation, infrastructure development, employment creation, technology transfer and market linkages. The government believes that expansion of commercialized and mechanized large-scale agriculture is important to enable the agriculture sector to meet food production and other industrial input demands. Accordingly, over 1.5 million hectares of land have been transferred to foreign and domestic investors in different lowland regions of the country (Azeb and Degife 2017; Lavers 2012).

Smallholder agriculture has also increasingly received political attention. In this regard, four five-year development plans have been implemented since 2002. These are the Sustainable Development and Poverty Reduction Programme (SDPRP, 2002/03–2004/05); the Plan for Accelerated and Sustained Development to End Poverty (PASDEP, 2005/06–2009/10); the Growth and Transformation Plan-I (GTP I, 2010/11–2014/15); and currently the Growth and Transformation Plan-II (GTP II, 2015/16–2019/20).

In all these development plans, agriculture is considered to be the area of focus. The GTP strategies especially emphasize the scaling up of land and labour productivity, diversifying strategies that are relevant to the different agro-ecological potential areas, and promoting specialization of agriculture, as well as strengthening market systems. So far, much of the effort focused on smallholder agriculture has been channelled towards the provision of modern agricultural technology inputs through a broad extension system (Kassahun and Poulton 2012). Despite such efforts, some argue that smallholder agriculture is facing challenges, such as low productivity, reliance on outdated traditional farming technology, and fragmented and small plots of land, particularly in highland

areas of the country (Leulseged et al. 2013). Unless these challenges are addressed the country will not be able to achieve real agricultural transformation.

Against such a background, this chapter explores approaches that are being implemented to change smallholder agriculture. It identifies cases of large-scale agricultural investments and studies their interaction with the smallholders in the lowland areas of the country. How does large-scale agricultural investment affect smallholder agriculture? To what extent are large-scale investors responsible for the social, economic and environmental impacts of the investments? It also explores outcomes of pilot marketing interventions in smallholder agriculture. How do smallholders respond to market incentives (value, access to market)?

Methods and data sources

Both secondary and primary data were used. Secondary data on government policies were obtained from reports, policy documents and activity reports. These included government documents and proclamations as well as contract agreements at federal and regional levels. Information about policies on agricultural investment, land lease and smallholder agriculture were assessed.

Primary data were also gathered, using case studies where qualitative (interviews, group discussions and observation) and quantitative (survey questionnaire) methods were used to generate the data. The first case deals with the effect of large-scale investment on smallholder farmers in the Gambella and Benishangul-Gumuz regions. This case study aims to assess how large-scale agricultural investment affects the food security, well-being and livelihoods of the local communities in the two regions.

The second case study explores the impacts of agricultural market linkage on smallholder farmer. It compares the impacts between traditional and contract farming contexts in Amhara and Oromia regions respectively. Potato is used as the case crop and the value chain around it is studied. The data for both cases were collected in 2013/14 based on a structured questionnaire and key informant interviews. In the first case study, a total of 120 smallholders were randomly selected and included in the survey. A total of four officials working for investors and ten government officials at federal and district levels were interviewed in both regions. In the second case study, respondents along the value chain (smallholder farmers, traders, support providers and consumers) were also included as survey participants.

The quantitative data collected from local farmers were analysed using descriptive statistical analysis techniques such as frequency, percentages, paired sample t-test and Weighted Average Index (WAI). However, the qualitative data collected from document review and interviews with key informants, investors, the government and other support providers were analysed thematically together with quantitative data.

Case 1: Large-scale agricultural investment and the smallholders in Gambella and Benishangul

Description of the study areas Both the Gambella and Benishangul-Gumuz regions are the prominent regions where large-scale land and water acquisitions have been taking place. Benishangul-Gumuz is located 665 kilometres from Addis Ababa in the north-western part of the country. The region is classified into three zones (Asosa, Kamashi and Metekel) and two special districts (Mao koma and Pawi). Including the two special districts, there are a total of twenty districts in the region. The total population of the region is estimated at 1,027,994 (CSA 2013). The ethnic groups that are considered indigenous to the region include Berta, Gumuz, Shinasha, Mao and Komo. However, large numbers of non-indigenous people comprising over 40 per cent of the population live in the region (Markakis 2011). Most of the region's population (over 86.5 per cent) live in rural areas and their livelihoods depend on agriculture. For this case study, Guba and Dangur districts were selected purposively because of the fact that they are the main foci of the recent rain-fed agricultural investments in the region, where pressure on the land resource is high. Two companies working in the region, namely S and P Energy Solutions PLC and Horizon Plantations PLC, were considered in this study.

The Gambella regional state is located 520 kilometres from Addis Ababa in the south-western part of the country, bordering South Sudan. The region is made up of a diverse mix of ethnicities, which include Anuak, Nuer, Majangir, Opo and Koma (ibid.). The region has a total population of 404,004 (CSA 2013). With an estimated area of 29,782 square kilometres, this region is sparsely populated with a density of 13.6 people per square kilometre. The region is rich in natural resources and extensive arable land, fed by four great rivers, suitable for large-scale irrigation development. The livelihood and income sources of the population depend on mixed agriculture supplemented by cattle-raising, fishing, hunting and traditional mineral-digging (Markakis 2011). However, the population's settlement is dispersed and access to basic infrastructure is minimal. Two districts, Abobo and Itang, were targeted for this study. The two large-scale agricultural companies, namely Karuturi and Saudi Star, were considered in the study.

Findings of the study

THE PROCESS OF AGRICULTURAL LAND ACQUISITION: Foreign investors are expected to obtain an investment licence before they are eligible to sign contracts and receive land for their investment. The Ethiopian Investment Agency (EIA) has the mandate to issue this licence for foreign investors (Proclamation no. 280, FDRE 2002). According to the investors, obtaining a licence is not a difficult process. The average time to get an investment licence is usually less than twenty days. After obtaining the investment licence, foreign investors apply for

large-scale agricultural land investment. Signing a contract with foreign investors is the responsibility of the Ministry of Agriculture. Under this ministry, the Agricultural Investment Land Administration Agency (AILAA) (initially known as the Agricultural Investment Support Directorate, AISD) is responsible for the signing and allocation of land for investors. After signing the contract, the ministry directly instructs the respected regions to identify and transfer land appropriate for the investment purpose, stipulating that the land to be identified should be land that is not utilized by farmers. Similarly, land that has significance in biodiversity conservation (such as hosting threatened or endangered plant species) is also prohibited. According to the key informants in both regions, it is the local officials who carry out the actual land allocation and conclude the final transfer processes, although the investment agreement conditions are signed between the federal government and the investors. Local people and communities are not part of the contract agreement and land transfer processes. Interviewees from foreign companies complained that the land transfer process is lengthy, sometimes taking up to seven months.

In general, the process of land acquisition is a top-down process. The central government verifies and approves investment and other protocols at the federal level. Authorities at the regional and local levels are responsible for identifying and allocating land. In these processes, the role of local people is largely neglected.

KEY DRIVERS FOR LARGE-SCALE INVESTMENT: Why investors choose to acquire land and farm in these regions is an important question. The key drivers for investment in Ethiopia, according to foreign investors, are the ongoing impressive economic growth and infrastructure development as well as government reforms to improve investment conditions. They also added that the land is fertile; the incentives are attractive (Investment Proclamation 280 (FDRE 2002), regulation no. 84/2003, and regulation no. 146/2008) and support from the government is good. An investor who can export more than 75 per cent of their produce is eligible for income tax exemption for seven years (Articles 4 and 5 of regulation no. 84/2003). Investors operating in relatively underdeveloped regions of the country, such as Gambella and Benishagul, are entitled to an additional one year of income tax exemption. Investors indicated that the land and labour are available and the agro-climate is suitable for agriculture in both areas.

The transaction of land for large-scale agricultural investment is made through negotiation based on the investors' applications and investment proposals. The land lease prices differ depending on the sector and size of investment. However, in general the price of land for agricultural investment is very low and does not reflect the market price of land. According to the new lease policy, if the farm is located 700 kilometres from Addis Ababa, the investor is expected to pay 111 birr (around US\$6)/hectare/year for rain-fed

agriculture. For farm areas located closer to Addis Ababa (the central market), the price increases by 4.05 birr (US\$0.21)/hectare/year for every kilometre from the 700-kilometre marker towards Addis Ababa. On the other hand, land located beyond the 700-kilometre marker receives a reduction in price of 4.05 birr (US\$0.21)/hectare/year for every kilometre it is located farther from Addis Ababa and the 700-kilometre marker. When it comes to irrigation farming the lease price is 158 birr (US\$8.5)/hectare/year and it will increase or decrease for every kilometre by 4.17 birr (US\$0.22) accordingly. This lease price is subject to revision every ten years. The practice in both regions, however, shows that the lease price is still lower than the stated principle. All the above driving factors are those internal factors initiated by the Ethiopian government.

These measures suggest that state policy plays an active role in promoting the development of large-scale agriculture. However, the investing country conditions, such as food security status, are also important drivers for land acquisition in Ethiopia in general and in the two regions in particular.

FOOD SECURITY: Local villagers have stated that their food security situation has worsened when compared to their situation before the investors' arrival. They confirmed that they lost access to forest food sources, shifting cultivation practices and cattle rearing as a result of the loss of land that is given to investors. Most of the villagers contacted stated that they are not producing adequate food in their resettlement site. Some of them are getting food aid from the government as part of the villagization programme until they start producing their consumption goods. Officials at regional and local level also agree that investors do not produce excess food crops for local supply. Investors, if they produce, do not supply their products to the local market. The utilization of companies' land was very low: they cultivated only 8–10 per cent of the leased land, and they are planning to produce to full scale in the future. However, key informants stated that the challenges resulting in their poor performance are diverse. These include poor infrastructure in these two regions, local resistance from the community, and difficult environmental conditions. But officials stated that their poor performance is due to poor investor commitment in fulfilling the planned investment requirements. According to them, some leases given to the companies were revoked owing to their failure to fulfil the contract agreement.

INFRASTRUCTURE AND SOCIAL SERVICES: Social services and infrastructure development directed at the villages falls under the villagization programme. Local people seem to agree that the services are expanding and improving. However, the contribution of foreign investors to infrastructure and social services development is minimal. Companies constructed roads for their farms, dams for their irrigation, and established temporary houses and offices for

their businesses. Although this has a positive effect in the long run, local communities still do not acknowledge their contribution. According to the local people and officials in Gambella, investors promised to construct schools, hospitals and to support students in their further education. However, this has not yet materialized. Investors believe that they are supporting the locals but they find the expectations very high. The contribution of investors to skilled and unskilled employment is very limited. So far companies have employed less than 10 per cent of the number they promised to employ. Most of these are temporary or seasonal employees with very low payment rates.

TECHNOLOGY TRANSFER: In both regions, companies have brought modern machinery (tractors, bulldozers, earth breakers, excavators, etc.) to their farms. They apply modern farming technology. In addition to this, they have brought expatriates from Asia and the Middle East. They have also employed young Technical Vocational Education and Training (TVET) graduates from the country. But actual skill transferred to local people remains limited. According to local officials and farm workers, the companies lack experience of managing large-scale farming. The company managers are highly bureaucratic. Farm workers in Gambella confirmed that the company managers treated them badly – there are no benefits or reward mechanisms, the salary is small and not regularly paid, no safety mechanisms are in place and there are no proper housing services. For them, companies are not functioning well, the machinery is sitting idle and the land is not used for adequate production, although arguably it is too early to judge. Farm workers are concerned about the sophisticated machinery purchased by the companies. Most of the machinery is operated by expatriates. Locals have expressed interest in operating it, but they do not have adequate training opportunities. The companies seem to focus on buying machinery without establishing effective and qualified farm teams. It is clear that a farm without motivated farm workers and adequate knowledge and skills will not succeed.

JOB CREATION: As discussed, the companies' contribution to skilled and unskilled employment is very limited. Wages are set mostly by the company and sometimes by collective agreement, but farm workers are unable to influence the company in seeking better payment. So there is no fixed payment for daily labourers who work in the field. The average wage for daily labourers in both regions is less than US\$1.25 a day, and this is not enough to support families and cover their costs, let alone provide savings.

NATURAL RESOURCE USE: Key informants in these regions confirmed that there is an enormous and rapidly increasing trend of environmental destruction caused by large-scale land investments. This is due to lack of appropriate land

use planning in both regions. These companies cleared and utilized their land without having a sound land use plan. They cut indigenous trees and cleared forests and they have not undertaken soil and water conservation measures to ensure the sustainability of the land.

RESPONSIBLE AGRICULTURAL INVESTMENT: The assumption that large-scale investments in agriculture follow responsible agricultural investment principles so that such investments do not harm smallholders had limitations. However, the above cases clearly show that foreign investment is not carried out based on the principles of responsible agricultural investment; rather it affects smallholders negatively in many respects. Although it is perhaps too early to judge, realizing the potential positive effects of these large-scale investments in agricultural development, at least in the short run, is not a given. The results show that there is limited free prior informed consent from local communities, poor planning in the sustainable use of resources (land, water and forests), limited infrastructure and social services, limited employment creation and technical knowledge transfer. This situation, if not managed properly and integrated with smallholders, is likely to negatively affect the development and transformation of agriculture.

Case 2: Potato value chain in traditional versus contract farming

Description of study sites The case studies were located in the Sinan district, in the Amhara region, and the Debre Zeit area, in the Oromia region. The potato marketing system in Sinan was a typical traditional marketing system, while Debre Zeit had a strong private sector involved not only in organizing the marketing chain, but also in serving as an innovation centre that provided improved potato seed varieties and advisory services. The name of the private company is SolaGrow PLC.

The Sinan district is located 327 kilometres from the capital, Addis Ababa. The district consists of 17 *kebeles* and has a total population of 103,870. The altitude of Sinan district varies from 2,600 to 4,088 millimetres above sea level, which is suitable for potato production. The major crops cultivated in the district are potato and barley. Although the district has irrigation potential, the major farming system is rain-fed agriculture and livestock rearing. However, owing to recurring natural phenomena (such as flooding, storms, variable rainfall and drought) and socio-economic problems (such as poor access to health and education facilities and veterinary services, limited access to safe drinking water, poor road infrastructure and technology, shortage of grazing land, prevalence of crop and livestock disease, overpopulation, etc.) farmers pursue subsistence agriculture.

SolaGrow PLC is located at Hidi in the Debre Zeit area, 50 kilometres from Addis Ababa, a major market destination. The company was founded by a

Dutch investor, Jan van de Haar. The founder of the company was motivated by the good experiences he had had of potato cultivation in desert areas of Israel, Egypt and Mali as a research manager at HZPC Holland BV, one of the leading seed potato companies in the Netherlands. He decided to resign his post in 2006 and continue as an entrepreneur in seed potato production in Ethiopia. The vision of the company is 'to contribute to the food production and food security of Ethiopia by providing seeds, expertise and technology to the farmers on a commercial basis, reinvesting its dividends into ongoing development of the agro-economic sector'. The company started its business with potato seed production and marketing but it has now targeted the entire value chain. The company has 23 hectares of irrigated land used as a demonstration field at Filtino, the area located between Hidi and Debre Zeit. The company leased about 500 hectares of land for large-scale production on its working sites, such as Doba, Wenchi, Koga, Mahoney, Hosanna and Welkite. The company has more than 450 permanent and temporary employees working on these sites. It has 200 contract farmers and aims to reach 12,000 farmers over the five years from 2013.

Findings of the study

VALUE CHAIN MAPPING: More than five market channels have been identified for consumer potatoes in the Sinan case study (see Figure 2.1). The shortest channel occurs when producers directly sell their produce to the consumers and the longest is when the producers sell their products to local traders; local traders sell on to wholesalers in the local market; wholesalers in the local market to other wholesalers in the regional and national markets and then to retailers; and the retailers to final consumers. There are many value chain actors at each stage with diverse roles. However, the value added to producers is very small with disproportionate value being enjoyed by the retailers and wholesalers. Investment made along the value chain is also very weak. In the case of SolaGrow, there are three channels identified in the value chain. The value chain is innovative and clearly shows the contribution of SolaGrow PLC as a source of input and market chain for the product. It is also evident that the SolaGrow contract farmers receive a greater benefit in the value chain when compared to farmers in the Sinan case. SolaGrow provides inputs to farmers and buys their produce. Originally SolaGrow focused on the production and marketing of potato seed as their core business. Since 2010, however, the company has focused on the whole potato chain. The major advantage of this approach is the strong relationships with the stakeholders of the potato value chain. The company played a role in establishing good cooperation with innovation centres, such as research institutions and universities. It works closely with individual farmers, farmers' groups and cooperatives.

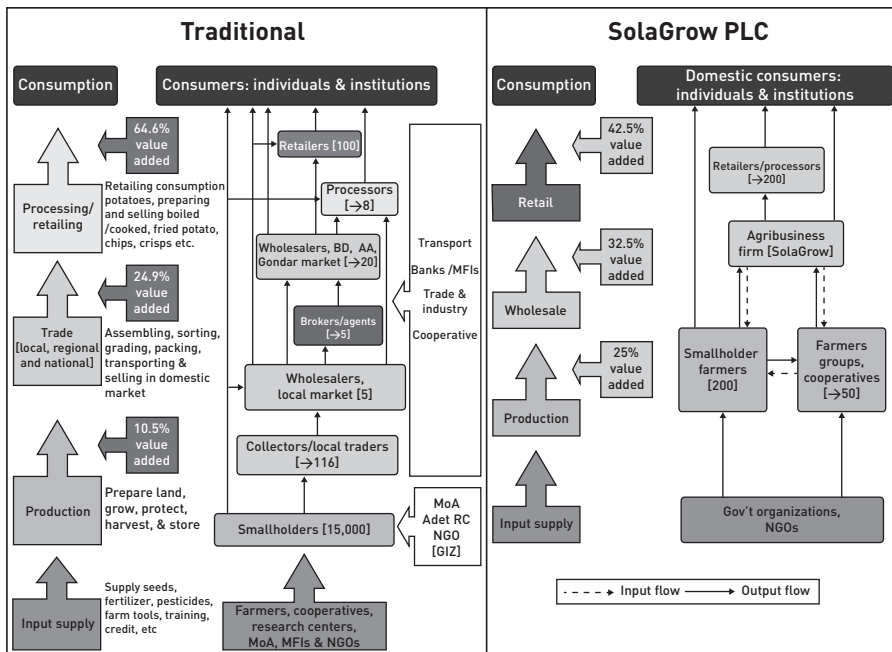


Figure 2.1 Consumption potatoes value chain at Sinan and Debre Zeit

INPUT SUPPLY: In Sinan, most potato growers (80 per cent) plant local seed. Three-quarters of the small farmers used traditional organic fertilizer and only one third of them used inorganic fertilizer. Pesticides and herbicides are supplied mostly by cooperatives, the agriculture office and individual private suppliers. Farm tools are supplied mainly by the agriculture office, cooperatives and research centres. However, farmers do not use improved varieties of potato seed and they do not use modern agricultural inputs owing to lack of awareness and inadequate supply. In the case of SolaGrow, the company has supplied improved varieties of seed potatoes, fertilizer, farm tools and technical advice. In contrast to the Sinan case, the majority of SolaGrow farmers used improved varieties of potato seed (90 per cent) and fertilizers (80 per cent). The company provides seed and fertilizer to outgrowers on credit and gives periodic training and technical assistance on site. The company has its own nucleus farms for seed production, demonstration and experimentation. The contract farmers and other interested potato growers are invited to attend demonstrations on potato production in practice; they share technical experience on how to use improved seeds, fertilizer, herbicides, etc.

PRODUCTION: The average farmland holding sizes in Sinan and SolaGrow were 1.35 hectares and 1.75 hectares per household respectively (see Table 2.1). The land allocated for potato production was higher in Sinan (0.74 hectares per

Variables	Sinan farmers (N=60)	SolaGrow farmers (N = 20)
Land size of sample farmers (hectares)	1.35	1.75
Land allocated for potato production (hectares)	0.74	0.56
Potato produced (kg)	5,096	8,288
Production per hectare (kg)	6,900	14,800
Potato consumed (kg)	1,737	1,492
Potato used for seed (kg)	860	1,160
Potato sold (kg)	2,000	4,973
Potato damaged (kg)	499	663
Consumption potatoes selling price (birr/kg)	8.8	11.66
Seed potatoes selling price (birr/kg)	13.79	23.86

Table 2.1 Average land size, production, consumption, sale and price (sample size = 120 households)

household) than for SolaGrow farmers (0.56 hectares per household) in 2013. The average potato yield of sampled farmers is estimated to be 6,900 kg/ha or (6.9 tons per hectare) in Sinan and 14,800 kg/ha (14.8 tonnes per hectare) in Debre Zeit. The productivity per hectare in Sinan is lower than the national average (8–10 tons per hectare) and this is due to the use of local potato varieties, poor seed quality, lack of agricultural inputs and poor management practices. But the yield per hectare in SolaGrow contract farmers is higher than the national average. This is due to SolaGrow’s support in input supply and technical advice.

LOCAL TRADE/COLLECTION: There are more than 116 potato collectors and local traders in the Sinan and Robe Gebeya area who are involved in the local potato trade. They purchase potatoes from the local growers, collect them in one place and then sell them to wholesalers or transport them to other towns. These local traders also collect potatoes on behalf of wholesalers, who pay them a small fee ranging from US\$0.02 to US\$0.08 per kg for the service. However, all their costs are also covered by the wholesalers themselves. Local traders can also purchase potatoes themselves and store them for some time, negotiate the price with wholesalers and sell them when necessary. But this form of business is highly risky according to them because they do not have any guarantee of a market and they lose money if the market price goes down. In some cases, the farmers themselves have to bring the potatoes to the wholesalers but this is not common. But in the case of SolaGrow, contract

farmers supply their product directly to the company. The role of local traders is not significant.

WHOLESALE: There are very few wholesalers who have the required wholesale business licence in Sinan. These few wholesalers at the local market sell potatoes to other wholesalers outside the district through brokers. However, the brokers sometimes go beyond facilitation of transaction and tend to set prices and take advantage of the process to receive greater benefit. They do not have trade licences, they manipulate prices and as a result they constrain the market system more than they facilitate ease of transaction. SolaGrow PLC is a wholesaler and retailer itself. It purchases the product from outgrowers as well as relying on internal production, and sells the product to users. The company pays farmers a premium of US\$0.04–0.11 per kg more than the market price and this encouraged farmers to sell their product to the company.

RETAILING: In Sinan, retailers mostly buy from wholesalers and sell to urban consumers. Sometimes they can also directly buy from the producers and sell to consumers through their grocery stores and open markets. Public organizations such as universities, hospitals, colleges and hotels are major consumers in the area and they purchase large quantities of potatoes directly from farmers or wholesalers. However, the profit margin is on average from US\$0.1 to US\$0.18/kg of potato. In the case of SolaGrow, apart from supplying seed potatoes to the export market and producer farmers and commercial farms, it established a new marketing chain for high-quality consumption potatoes – by supplying to hotels, restaurants, supermarkets, institutions and other high-end consumers via its established shopping centres around Debre Zeit and the capital city, Addis Ababa.

PROCESSING: Large-scale potato processing is non-existent in Ethiopia in general and in the study areas in particular. Potatoes are commonly boiled, or are cooked in different traditional dishes, known as 'Wat'. Potato chips, crisps and roasted potatoes have in recent years become more popular, especially in the major cities such as Addis Ababa. The supermarkets have also started to sell potato products such as chips and crisps. In urban areas potatoes are usually eaten with other vegetables as salad. It is common to see hotels, restaurants and cafés preparing French fries. Street vendors also prepare French fries and sell them in the streets. In rural areas such as Sinan, however, potato consumption is limited to potato stew, and boiled and sometimes fried potatoes.

CONSUMPTION: Potato consumers are individual households (rural and urban dwellers) and institutions. In Sinan, for example, institutions (Debre Markos University, the Police College, prison, teacher training college and Debre

Markos Hospital) are the largest potato consumers, since they provide for a large number of individual consumers. These institutions consume on average from 10,000 to 15,000 kg per week, which constitutes about 45 per cent of the total consumption, but this depends on the peak and slump seasons. The remaining percentage is consumed by hotels, restaurants and individual households in rural and urban areas within and outside Sinan. The large market for seed potatoes for SolaGrow PLC is contract farmers, other individual farmers and commercial farms all over the country. Potatoes are consumed largely by institutions and individuals at Debre Zeit, Adama, Woliso, Jima, Addis Ababa and other major cities of the country.

VALUE ADDED IN POTATO VALUE CHAIN: Value addition is the difference in sale price and cost of inputs (raw materials) at each stage of the value chain. The survey in Sinan shows that the farmers' price for consumption potatoes is US\$0.09 per kg; wholesalers sold them at US\$0.15 per kg and retailers at US\$0.25 per kg. The average sale price of potatoes per kg for producers, wholesalers and retailers in SolaGrow is US\$0.12, US\$0.20 and US\$0.23 respectively (see Table 2.2). The price change from producers to consumers is more than 200 per cent in Sinan and less than 100 per cent in SolaGrow. Potato producers in Sinan added 10.5 per cent of the total value for consumption of potatoes in the district. Retailers are responsible for 64.6 per cent of the value and wholesalers added about 24 per cent. The highest profit is earned by the retailers but the scale of operation is small. On the other hand, the wholesalers make a small profit margin per unit of potato handled, but their operational scale is big, making them the dominant value chain actors. The value added in the SolaGrow value chain by producers, wholesalers and retailers is 24.75 per cent, 32.6 per cent and 42.5 per cent respectively, and this is relatively better than the Sinan case in terms of the distribution of values added.

Overall, the prospect for potato production and marketing in Ethiopia is promising owing to the agro-ecological suitability of the land and irrigation

Cooperative	Producers	Wholesalers	Retailers	Consumers
Average sales price (\$/kg)	0.09	0.15	0.27	
Average cost of inputs	0.059	0.077	0.08	
Gross value added	0.031	0.073	0.19	
% of total value added	10.50	24.90	64.60	
SolaGrow PLC				
Average sales price (\$/kg)	0.12	0.20	0.23	
Average cost of inputs	0.05	0.112	0.116	
Gross value added	0.067	0.088	0.114	
% of total value added	24.75	32.6	42.5	

Table 2.2 Distribution of value addition for consumption potatoes

potential. However, at present the value chain is not well developed. The Sinan case is traditional and underdeveloped while SolaGrow's approach is more promising and innovative. SolaGrow PLC's inclusive value chain model clearly improves the livelihoods of smallholder farmers.

Conclusions

In an attempt to stimulate agriculture, Ethiopia is adopting multiple strategies. Legal and institutional frameworks, policies and strategies are in place in an effort to transform the agriculture sector. The large-scale foreign investments promoted in lowland areas have not achieved the expected results. In fact many of the investments can be regarded as failures. Major policy revisions are needed to set a more realistic approach as to the potential and role of large-scale agriculture in Ethiopia.

The traditional smallholders' subsistence agriculture continues to dominate the highland areas of the country. Based on the pilot case studies on market interventions, smallholder farmers do respond positively to interventions that are comprehensive and integrated. The case of contract farming for potato demonstrated that smallholders can be integrated into a commercial scheme and farmers have the potential to supply products as long as there is a secure and better market for their products. For this to take off, responsible foreign or domestic investors who can provide innovation and create value addition in the marketing system for the smallholder producers are important agents of change. Therefore, to effectively commercialize smallholders and transform the agriculture sector, investment in skills and technology, financing and capital, infrastructure development (rural roads, electricity, water, irrigation, etc.) and organization of logistics of trading, marketing and storage are required from the government, donor agencies and smallholders themselves.

This chapter also argues that smallholders' agriculture is more promising when there is better integration with large-scale investment in Ethiopia. Investment by the government and smallholders themselves is required to improve agricultural productivity. The two cases discussed highlight the importance of commercializing smallholders in the form of contract farming and of investment in the overall development of an agricultural value chain. The chapter also argues that, for large-scale investment to succeed, it must follow the principles of responsible agricultural investment and integrate itself with smallholders' agriculture. In this regard, the call by international agencies, such as FAO, and scholars for a new direction in investment in agriculture is a relevant consideration. They argue that responsible agricultural investments should facilitate access to markets, promote value chain development, respect and protect land tenure security. This points to the need to set the notion of responsible agricultural investment within a broader political and economic framework of the country hosting the investments.

References

- Abenet, B., L. D. John and M. A. Frank (1991) 'Development of agriculture in Ethiopia since the 1975 land reform', *Journal of Agricultural Economics*, 6: 159-75.
- Azeb, W. and W. Degife (2017) 'The intricacies of large-scale agricultural investment in Gambella Region, Ethiopia', Unpublished paper prepared for presentation at the 2017 World Bank Conference on Land and Poverty, Washington, DC, 20-24 March.
- Birner, R. and D. Resnick (2010) 'The political economy of policies for smallholder agriculture', *World Development*, 38(10): 1442-52.
- Castel, V. and A. Kamara (2009) 'Foreign investments in Africa's agricultural land: implications for rural sector development and poverty reduction', Development Research Brief 2, African Development Bank.
- Cochrane, L. (2014) 'Agricultural intensification in Ethiopia: review of recent research', *African Journal of Agricultural Research*, 9(3): 2377-90.
- Collier, P. and S. Dercon (2014) 'African agriculture in 50 years: smallholders in a rapidly changing world?', *World Development*, 63: 92-101.
- Conway, G. (2014) 'On being a smallholder', in P. Hazell and A. Rehman (eds), *New Directions for Smallholder Agriculture*, Oxford: Oxford University Press.
- CSA (Central Statistical Agency) (2013) 'Ethiopian national population statistical abstract', Addis Ababa: Central Statistical Agency of Ethiopia.
- De Schutter, O. (2011) 'How not to think of land-grabbing: three critiques of large-scale investments in farmland', *Journal of Peasant Studies*, 38(2): 249-79.
- Deininger, K., D. Byerlee, J. Lindsay, A. Norton, H. Selod and M. Stickler (2011) 'Rising global interest in farmland: can it yield sustainable and equitable benefits?', Washington, DC: World Bank.
- Dessalegn Rahmato (2004) 'The agricultural policies of the imperial regime: what lessons can we draw?', Unpublished document.
- (2011) 'Land to investors: large-scale land transfers in Ethiopia', Policy Debates Series no. 1, Addis Ababa: Forum for Social Studies.
- Dixon, J., K. Taniguchi, H. Wattenbach and A. Tanyeri-Arbur (2004) 'Smallholders, globalization and policy analysis', Occasional Paper 5, Rome: Food and Agriculture Organization of the United Nations.
- EEA (Ethiopian Economic Association) (2005) 'Transformation of the Ethiopian agriculture: potentials, constraints and suggested intervention measures', Report on the Ethiopian Economy IV 2004/05, Addis Ababa.
- FAO (Food and Agriculture Organization of the United Nations) (2012) 'The state of food and agriculture', Rome: FAO.
- FDRE (Federal Democratic Republic of Ethiopia) (2002) 'Re-enactment of the investment proclamation', *Federal Negarit Gazeta*, Proclamation no. 280.
- (2003) 'Investment incentives and investment areas reserved for domestic investors', *Federal Negarit Gazeta*, Council of Ministers Regulation no. 84.
- (2005) 'Rural land administration and land use proclamation', *Federal Negarit Gazeta*, Proclamation no. 456.
- (2008) 'Council of Ministers regulation to amend the investment incentives and investment areas reserved for domestic investors', *Federal Negarit Gazeta*, Regulation no. 146.
- (2010)' Growth and Transformation Plan 2010/11-2014/15', vols I and II, Ministry of Finance and Economic Development.
- Genet, M. (2009) 'International agricultural land deals award Ethiopian virgin lands to foreign companies', www.ethiomeia.com/adroit/ethiopian_virgin_land_for_sale.pdf.

- Godfray, H., J. Beddington, I. Crute, L. Haddad, D. Lawrence, J. Muri, J. Pretty, S. Robinson, S. Thomas, C. Toulmin et al. (2010) 'Food security: the challenge of feeding 9 billion people', *Science*, 327(5967): 812–18.
- Gollin, G. (2014) 'Smallholder agriculture in Africa: an overview and implications for policy', IIED Working Paper, London: IIED.
- Hazell, P. and H. Rehman (2014) *New Directions for Smallholder Agriculture*, Oxford: Oxford University Press.
- Jack, B. (2013) 'Constraints on the adoption of agricultural technologies in developing countries', Unpublished literature review, Agricultural Technology Adoption Initiative, J-PAL (MIT) and CEGA (UC Berkeley).
- Kassahun Berhanu and C. Poulton (2012) 'The political economy of agricultural extension in Ethiopia: economic growth and political control', *Future Agricultures Working Paper 042, Development Policy Review*, 32(s2): 197–213.
- Kay, S. (2014) 'Reclaiming agricultural investment: towards public-peasant investment synergies', Policy paper, TNI Agrarian Justice Programme.
- Lavers, T. (2012) "'Land grab" as development strategy? The political economy of agricultural investment in Ethiopia', *Journal of Peasant Studies*, 39(1): 105–32.
- Leulseged Yirgu, A. Nicol and S. Srinivasan (2013) 'Warming to change? Climate policy and agricultural development in Ethiopia', Working Paper 071, Addis Ababa: Future Agricultures Consortium.
- Markakis, J. (2011) *Ethiopia: The last two frontiers*, James Currey.
- Mulugeta Gebrehiwot (2014) 'A delicate balance: land use, minority rights and social stability in the Horn of Africa', Addis Ababa: Institute for Peace and Security Studies.
- Reardon, T., K. Chen, B. Minten and L. Adriano (2012) 'The quiet revolution in staple food value chains: enter the dragon, the elephant and the tiger', Asian Development Bank and International Food Policy Research Institute.
- Scoones, I. (2009) 'Livelihoods perspectives and rural development', *Journal of Peasant Studies*, 36(1): 171–96.
- Stephens, P. (2013) 'The principles of responsible agricultural investment', *Globalization*, 10(1): 18–192.
- Syed, S. and M. Miyazako (2013) 'Promoting investment in agriculture for increased production and productivity', Food and Agriculture Organization of the United Nations.
- Thorbecke, E. (2007) 'The evolution of the development doctrine, 1950–2005', in G. Mavrotas and A. Shorrocks (eds), *Advancing Development: Core themes in global economics*, Palgrave Macmillan, pp. 3–36.
- Von Braun, J. and R. Meinzen-Dick (2009) "'Land grabbing" by foreign investors in developing countries: risks and opportunities', Policy Brief 13, International Food Policy Research Institute.
- Wiggins, S. and S. Keats (2013) 'Smallholder agriculture's contribution to better nutrition', Overseas Development Institute.
- World Bank (2011) 'Climate-smart agriculture: increased productivity and food security, enhanced resilience and reduced carbon emissions for sustainable development', World Bank.

3 | Large-scale canal irrigation management by smallholder farmers

Atakilte Beyene

Water and water infrastructures are at the centre of renewed political and development discourse in Ethiopia. Fuelled by the urgent need to address climate change, food security and economic development, water has become a gateway for state intervention in rural social, environmental and economic spheres. In the case of Ethiopia, the role and presence of the state in rural areas have historically been deep. The state, for instance, has legal ownership of rural land, through which it has influence in rural areas. The development-oriented political discourse that the Ethiopian government has crafted over the past decade has reinforced the role of the state even further. This has expanded arenas of rural intervention. One example of this is the series of state-led, large-scale water projects intended to benefit smallholder farmers. The appeal of such undertakings, described as pro-poor development projects, is evident, as they target the most marginalized people in the country – smallholder farmers, who are also the largest group of poor people in Ethiopia. The irrigation schemes involve a mixture of management regimes, ranging from central management by the state to collective action by water users. This chapter highlights the fact that although the provision and development of water infrastructure have improved the availability of water for irrigation, systemic integration of institutional, cultural and organizational dimensions of irrigation management into the irrigation schemes requires further attention.

Ethiopia's focus on water

Over the past two decades, water has increasingly become central to Ethiopia's policy and development agenda. Three major policy spheres in which water is key are poverty reduction, economic growth and climate change mitigation and adaptation objectives. Since the early 2000s, the country has had a policy plan for poverty reduction (MoFED 2006). Under this plan, water harvesting is a main pillar of the national food security strategy. Accordingly, extensive pro-poor, rural and natural resources development programmes have been undertaken in many parts of the country, where rural people have been mobilized for conservation work to reclaim environmentally degraded areas (Gebrehaweria et al. 2009). The construction of small-scale water conservation

structures in hillside areas and on arable land forms part of the programme. Similarly, household-level on-farm water-storage facilities, such as ponds, and community-level medium-scale dams are being constructed for irrigation, livestock and other purposes.

Ethiopia's ambition to achieve middle-income country status by 2025 is also directly or indirectly dependent on water. The Growth and Transformation Plan (GTP) of the country, which has been in place since 2010, aims to achieve this goal (FDRE 2010, 2014). According to this goal, agricultural growth through improved productivity is conceived as the basis for the transformation. Again, water and land are key to the plan. In addition to the extensive small-scale water development projects, large-scale water infrastructure projects have increasingly become a priority under the GTP. The economic growth and transformation agenda also embraces the development of commercial and export-oriented agriculture. Notable in this are floriculture, sugar and food production systems; the public and private sectors have been prominent in these production sectors. Since 2008, water and land have been at the heart of a 'new' economic and political discourse. To encourage and attract investors – and thereby the flow of foreign direct investment – into the country, water-rich and high-potential agricultural areas are used as incentives (Atakilte and Sandström 2016; Bues and Theesfeld 2012). Although there is no complete assessment of the geographic locations of the investments, many are believed to be located around lakes and along the major water basins of the country, where water is available. Furthermore, historical, political and demographic dynamics in the region are also reinforcing the centrality of water for Ethiopia (Oestigaard 2012).

Ethiopia's climate policy – Climate-Resilient Green Economy – aims for the country to achieve climate-resilient and green middle-income economic status by 2025, with zero net emissions (FDRE 2011). Two of the four pillars of the strategy – improving efficiency of agriculture, and deployment of renewable and clean power generation – relate directly to water.¹ The first calls for an expansion of access and more efficient use of water in agricultural systems. Expansion of small-, medium- and large-scale irrigation schemes is one major area of state intervention. Renewable energy production has also entered a new era, as the country strives to generate the lion's share of its energy needs from hydropower, for which large-scale dams are required.

These broad political, economic and environmental processes have situated water as a key resource, attracting a wide range of actors, such as the state, farmers and investors (domestic and foreign alike). The concurrent expansion of water infrastructure and the diverse economic objectives surrounding water generate a range of political, social, organizational and environmental processes. Knowledge of the evolving social, institutional and governance systems is

important, in order to explore the potentials and challenges of the emerging water schemes.

This chapter explores a specific form of state intervention, namely large-scale irrigation constructed by the government for use by smallholder farmers. This type of irrigation is significant for the following reasons. First, it involves numerous smallholder farmers, who are expected to collaborate and organize themselves in order to manage the canal and irrigation systems. Understanding how farmers are getting on with managing the scheme is crucial. Second, the irrigation scheme induces a radical shift in farming practices – from a predominantly rain-fed to a predominantly irrigated agricultural system. This entails an adjustment in the allocation of household resources for farming. Third, the scheme involves different actors with different stakes. How the multi-stakeholders collaborate is important to understand. Finally, such initiatives are relatively new to the country. Hence, the lessons have important implications for other similar projects that are under construction.

Irrigation – underdeveloped, but emerging

Ethiopia's economy is mainly dependent on agriculture. Agriculture contributes 40 per cent to GDP and employs 80 per cent of the labour (FDRE 2011). The two dominant agricultural systems are the mixed farming and the pastoral systems. The mixed farming system, where farmers combine both crop and livestock production, is mainly located in the highlands, where population density is high and landholdings are very small – about one hectare of land per household (CSA 2014). These systems are predominantly rain-fed, and the dependency on rainfall has been recognized as a major source of vulnerability. Recurrent drought, variability of rainfall and climate change have seriously challenged the agricultural sector. Irrigation has been identified as a key means of adapting to and mitigating climate change impacts in the agricultural systems.

Ethiopia's irrigation agriculture is relatively underdeveloped, compared to other African countries. Of the total 12.28 million hectares of cultivated land in 2006, only 5 per cent was irrigated (MoFED 2006). Most of the irrigated area (77 per cent) was under small-scale traditional irrigation systems (Fitsum et al. 2009). Traditional irrigation schemes have no permanent diversion structures and are reconstructed every year from local materials by the farmers themselves. They constitute free flood intake, furrow systems and river diversions. More recently spate irrigation, water pumps and small ponds have been reported in different parts of the country (Mehretie and Woldeamlak 2013; Steenberg et al. 2011).

However, the potential for irrigation is large. Estimates indicate that Ethiopia has 5.3 million hectares of land that are suitable for irrigation, of which 3.7 million hectares can be developed using surface water sources, and 1.6 million hectares using ground water and rainwater management (Seleshi and Mekonen

2011). In its recent plans, the government spelt out that it intends to expand agricultural production by an additional 3 million hectares, with the addition of small- and large-scale irrigation schemes (Conniff et al. 2012). Over the short term, interventions in small-scale schemes are seen as enabling the country to leverage its abundant labour, while reaching rural households and communities. In this regard, community-based small-scale dam constructions and river diversions are set as targets (Seleshi 2010; Mehretie and Woldeamlak 2013; Fitsum et al. 2009). As a long-term plan, the expansion of modern, large-scale irrigation schemes is high on the policy agenda.

Policy drive for modern irrigation for smallholders

Not only has ‘modern’² irrigation a short history in the country, it also has almost no association with smallholder farmers (Rami 2003). Very few modern irrigation systems were introduced in the 1960s and 1970s, and their significance in terms of area coverage has been very low. In 2009, it was reported that Ethiopia’s modern irrigation system covered only 1.6 per cent of the total cultivated area (Fitsum et al. 2009). However, this appears to have been changing fast over the past decade, as irrigation schemes expand across the country. Modern irrigation systems are seen as long-term projects with the aim of bringing about economic growth and overcoming the challenge of the correlation between rainfall and agricultural growth (MoWR 2006, 2002). Hence, such initiatives are seen as especially important for the country’s development plan (Seleshi 2010).

With four large-scale dams completed and in use for irrigation, four currently under construction and fifteen more planned (Verhoeven 2011), the area under dammed irrigation will be significant. Some of the dams are multipurpose, covering hydropower, fisheries and irrigation; others are constructed to provide irrigation facilities for small-scale agriculture. During the first three years of the GTP period (2010/11–2013), feasibility studies and design works for large- and medium-scale irrigation schemes were undertaken on a total of 541,000 hectares of land (FDRE 2014). During the same period, construction work on large- and medium-scale irrigation schemes was undertaken on 171,000 hectares. By the end of the GTP in 2015, the total land under medium- and large-scale irrigation was expected to have reached 786,000 hectares. Notable megaprojects here are the five sugar cane plantations under construction by the Ethiopian Sugar Corporation.³

The introduction of medium- and large-scale irrigation schemes for smallholder farmers is also a major part of the modernization process covered by the current policies. Although the large-scale irrigation schemes continue to be under public management, recently there have been efforts by the government to involve smallholders in the use and management of modern schemes. The promise of this approach is that – by improving the storage of water and its

availability for irrigation by smallholder farmers – dams and irrigation schemes will create employment and improve food security for smallholder farmers in rural areas. The flip side of this is that the changes and adaptations that the smallholders must make in order to operationalize the planned irrigation schemes are enormous. The shift from predominantly rain-fed to predominantly irrigation agriculture entails changes in farming practices. Above all, the new production schemes require collective action and coordination of management among water users and stakeholders. Changes are also required in policies and the institutional framework, in order to support smallholders' use and management of the new irrigation production system.

Collective management and collaboration

In his book *Seeing Like a State*, Scott (1998) asks why certain schemes that are intended to improve the human condition fail. Large-scale irrigation schemes often face critical sustainability challenges in many parts of the world (Callejo and Cossio 2009; Garces-Restrepo et al. 2007). A common feature is that while governments are often swift to implement the delivery of infrastructure projects, the establishment of governance systems that can support sustainable use and management of such infrastructure is challenging.

The case study scheme involves not only numerous water user households, but also different stakeholders. Central in this regard is coordination of the management of the scheme. The alternatives in this are central or decentralized management, or a combination of both. Some argue that for large-scale irrigation schemes, central administration is more effective. Formal monitoring and administration of irrigation schemes might be effective in implementing projects, but may not guarantee sustainability and efficiency (Hunt 1988). Others indicate that decentralized management of irrigation is better (Carlsson and Berkes 2005). Related to this is the self-organized management of irrigation schemes as an important condition for the development of a sustainable management structure (Ostrom 1990).

This chapter presents a case study where management of the scheme combines elements of both central and decentralized systems.

Case study: Koga Dam and Irrigation Scheme

Physical infrastructure and scheme layout The Koga Dam and Irrigation Scheme is a large-scale dam and irrigation scheme in the Lake Tana Basin in north-western Ethiopia. It is the first showcase of a series of planned projects. Therefore, it provides an interesting opportunity to study the prospects and challenges so far, as well as to draw lessons that may be directly relevant for the other projects under construction. The scheme was constructed in 2008 by the Ethiopian Ministry of Water and Energy at an initial cost of US\$50

million, to provide irrigation for small-scale agriculture. Irrigation agriculture started in 2010.

According to the International Commission on Large Dams classification criteria,⁴ the Koga Dam can be classified as a large dam (see Table 3.1). The infrastructure includes the dam (reserve capacity of 81.3 million cubic metres) and twelve water storage and command facilities located along an almost 20-kilometre main canal. There is also a 42.4-kilometre secondary canal, 112 kilometres of lined and unlined tertiary canals, 97 kilometres of drainage canals and 2,921 concrete and masonry structures. The dam can irrigate about 7,000 hectares and benefits about 14,000 smallholder farm households. According to the project plan, the irrigation scheme should lead to an additional production of 15,000 tons of maize, 24,000 tonnes of potatoes, 18,000 tonnes of onions and 5,400 tonnes of wheat (AfDB 2001). In March 2014, 5,800 hectares were put under cultivation by a total of about 7,300 farm households (Atakilte, unpublished field report). The Koga Dam has a catchment of 22,000 hectares. Watershed management programmes (including soil and water conservation and forestry programmes to reduce soil loss by 50 per cent) are part of the project plan (ibid.).

The irrigation area is divided into twelve blocks, with an average size of 583 hectares (minimum 290 hectares and maximum 864 hectares) (see Figure 3.1 and Table 3.2 below). Each block has its own water storage area, which is an excavated large open pond, the pond bottom reinforced with fine soil materials, plastic sheets and some concrete materials. These ponds are distributed along the roughly 20-kilometre main canal at suitable locations, so that gravity irrigation is possible. A network of secondary canals leads the water

The dam and its irrigation canals	The irrigation scheme
<ul style="list-style-type: none"> • Catchment area 22,000 ha • Dam height 21.5m and dam crest length 1,730m • Reservoir area 1,750 ha • Dam water holding capacity 81.3 million m³ • Main canal discharge 9.1 m³/sec • 19.7 km main canal • 12 water storage and command facilities (located along the main canal) • 112 km lined and unlined tertiary canals 	<ul style="list-style-type: none"> • Number of beneficiary family heads 14,000 • Total irrigation land 7,002 ha • Irrigated land (March 2014) 5,828 ha

Table 3.1 Summary information: Koga Dam and Irrigation Scheme

Source: Abbay Basin Authority Koka Water Structure Management and Water Administration Centre, Chaha Woreda Office

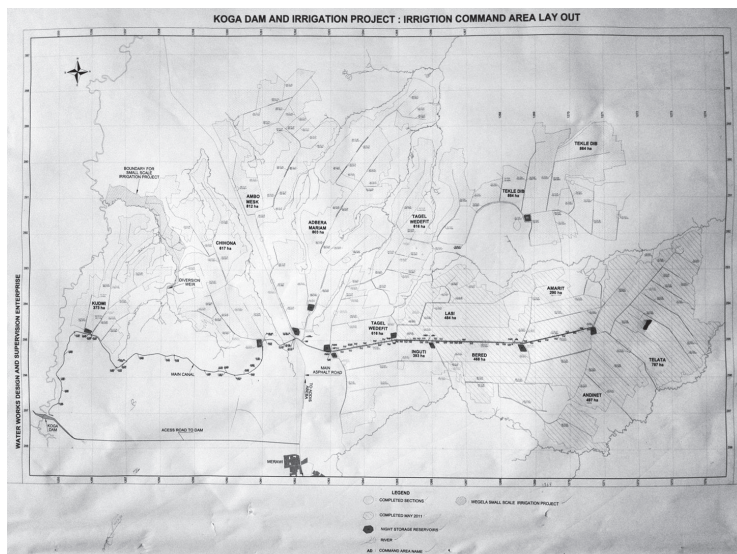


Figure 3.1 Koga Dam and Irrigation Scheme: map showing scheme layout, water storage sites and irrigation sites.

Source: Koga Dam and Irrigation Project Office, Chaha Woreda

Command and water storage area	Irrigated area (ha)	Length of secondary canals (metres)	Length of lined tertiary canals (metres)	Length of tertiary unlined canals (metres)	Length of drains (metres)	Concrete structures (number)	Beneficiary households (number)
Kudmi	373	875	1,901	6,838	4,582	238	746
Chihona	617	3,756	1,389	9,412	6,307	240	1,234
Inguti	393	779	3,599	3,670	5,540	218	786
Ambo Mesk	812	7,186	1,855	10,550	10,312	251	1,624
Adbera Mariam	803	8,054	695	11,659	4,408	314	1,606
Lasi	484	2,505	1,601	7,321	6,970	176	968
Bered	468	2,875	3,523	4,501	6,282	189	936
Andnet	497	2,641	1,852	4,378	7,891	163	994
Amarit	290	868	392	5,207	4,419	106	580
Tegel Wedefit	616	4,472	1,850	6,810	9,655	322	1,232
Tekel Dib	864	5,530	5,810	6,256	18,857	340	1,728
Telata	787	2,841	4,233	6,822	11,926	271	1,574
Total	7,004	42,382	28,700	83,424	97,149	2,828	14,008

Table 3.2 Irrigation command areas, canals and beneficiaries of the Koga Irrigation Scheme

Source: Abbay Basin Authority Koka Water Structure Management and Water Administration Centre, Chaha Woreda

over the block areas. The tertiary canal networks then lead the water to each farm boundary. Each farmer then applies furrow irrigation to his or her plot. The furrows are parallel ditches constructed on the field by the farmers using animal traction or by hand.

Focus on food security and smallholder farmers Interestingly, the primary purpose of the irrigation project is to provide access to irrigation for smallholder farmers in the local areas. Access to adequate water, agricultural inputs and agricultural services, such as extension services, forms part of the project. The ambition of this project is to change the smallholder farming system from the current subsistence practices towards more productive and commercially oriented practices. Improving livelihoods, food security and rural employment are key objectives of the project. Other economic objectives include expansion of private commercial farms, fishery and tourism.

Farmer displacement, compensation and land consolidation The dam and irrigation project involved programmes of displacement of farmers from the water dam site and other infrastructures of the canal system. In this process, the farmers were compensated for the properties they lost. Cash was paid for lost properties, such as houses, farms and other long-term investments (such as trees and conservation structures). This programme was assisted financially by the World Bank. In addition to the cash, the farmers were given a plot of land on which to build their houses and irrigation land from the project.

Major farm consolidation and redistribution programmes were also carried out in 2009 to pave the way for the irrigation schemes. This involved all farms located in the irrigable area. Previously, household farms used to be fragmented and located in different areas. With the land consolidation programme, all farms located within the irrigable downstream area were consolidated and a new redistribution was carried out among the households. The households were given 80 per cent of their respective previous landholdings. The 20 per cent deducted from each farm household downstream was transferred to the government for various purposes, but mainly to accommodate farmers who lost land because of the dam water body and to create a land reserve for private investors.

Stakeholders and canal management set-up The key stakeholders involved in the project are the Ethiopian government, the World Bank, the African Development Bank and the rural people. The role of the banks has been limited to financial support for the construction of the project and the compensation of displaced farmers. They were also involved in impact assessment and appraisal studies of the project. The government has been the

major actor in key areas such as financing, construction, distribution of land and water, and the organization of local people. These activities involved a number of government agencies. While the construction of the project was undertaken by the Ministry of Water and Energy, the Abbay Basin Authority Agency was tasked with regulating the distribution of water. It has the mandate to administer the dam, as well as the primary and secondary canals. The mandate includes regulating the release of water at the main dam outlet and the refilling and release of water at the twelve water storage sites, as well as the release of water at secondary canals. To administer these, experts from the basin authority are stationed in the local area.

The Ministry of Agriculture and Rural Development, including extension services on irrigation provides agricultural inputs such as improved seeds and fertilizer for the farmers. Land allocation, registration and certification are managed by the Rural Land Administration Bureau.

The local government, through the Cooperative Promotion Agency (CPA), has also organized the households into twelve water ‘cooperative’ groups. In principle, the farmers in each block are aggregated into a water ‘cooperative’ group. These groups are irrigation beneficiaries and are responsible for managing the tertiary canals.

The water ‘cooperatives’ were more or less created by the CPA. The agency applies a general policy directive that was developed for rural cooperatives. Since the change in government in 1991, there have been renewed efforts to revitalize policies on cooperatives. A legislative framework on the promotion and establishment of cooperatives came into force in 1994.⁵ In 1998 and 2004, there were additional proclamations⁶ that reinforce the principles and strengthen membership incentives by improving members’ rights in the areas of ownership, voting, share transfer and risk management. The CPA (under the Ministry of Trade) facilitates the formation of cooperatives. It has offices at the federal, regional, zonal and district levels of government. According to Ethiopian Cooperatives Professional Associations,⁷ by 2011 approximately 37,247 cooperatives and 245 unions were reported to exist in the country. During 2015, 7,283 new cooperatives were reported to have been established.⁸

Irrigation cooperatives, which in 2009 constituted fewer than 4 per cent of cooperatives (Emana 2009), are one of the many types of cooperatives established by the CPA. The practice in general is quite similar, as they follow the general rules and directives, and the CPA at the local level is involved in initiating and/or facilitating the process (the following box indicates provision at the local level).

Box 3.1

The Cooperative Promotion Agency is tasked with organizing farmers into cooperatives in various economic sectors, of which irrigation is one. The agency has developed models on the formation and internal regulations of the cooperatives. For the irrigation cooperatives, the model constitutes the following aspects.

1 General: It offers legal frameworks for the recognition of cooperative entities. It identifies the cooperative by specific name, date of establishment, number of members and definition and clarification of terms (such as irrigation and watershed).

2 Administration: Cooperatives, through their elected committees, are responsible for the protection and management of irrigation facilities. The committees are responsible for compiling data (on land to be irrigated, types of crops to be planted, and number of beneficiaries for each season) and communicating this to the Bureau of Agriculture one month in advance of the start of the cropping time. Irrigation and agronomic decisions are then approved at an assembly meeting that involves all beneficiaries.

Users that are not members of the cooperatives must ensure a contractual agreement with the water cooperatives in order to get access to irrigation water.

3 Canal development practices: Through the general assembly, establishment of an *executive committee*, a *control committee* and a *management and administration committee* that oversee the cooperative's canal development activities.

Source: Irrigation Cooperative Internal Model Regulations, Cooperative Promotion Agency, Amhara Regional State, 2011, Bahir Dar.

Note: Original Amharic text translated by the author.

Issues and gaps in irrigation management

A major implication of the above processes is that there is a lot of restructuring and a tremendous drive by the state and other agencies to promote irrigation among smallholder farmers. The broader policy agenda to promote agriculture and develop the infrastructure seems to have paved the way for a centralized and interventionist approach to restructuring. Interviews with local officials from the various bureaus and authorities, as well as with farmers, indicate a number of issues and gaps in management of the irrigation systems.

Challenges in coordination Poor coordination was indicated by local officials as one of the major challenges in the management of the scheme. This challenge was particularly emphasized with regard to government agencies. As an example, coordination challenges between the Koga Basin Authority (KBA) (a sub-office of the Abbay Basin Authority) and the Ministry of Agriculture and Rural Development (MARD) were indicated as undermining the plan and the forecasting of water requirements. While the KBA is responsible for documentation, forecasting, budgeting and distributing water over the whole scheme, the MARD is responsible for the crop and agronomic support system

of the irrigation scheme. Both agencies have offices at the *woreda* administrative level. The main problem indicated was that the planning for the water budget and water allocation did not take account of the type and coverage of crops: information on crop types, area to be covered, frequency of cropping by farmers, etc., was not provided by the MARD to the KBA in due time, before the cropping season started. This poses challenges for farmers who plan to have two harvests during the dry season.

To address this, a knowledge-exchange system that allows stakeholders to share information and responsibility is necessary.

Uncertainty and poor sense of ownership in the early stages of the project

According to the informants, uncertainty about and resistance to the project were high at its early stage. One of the reasons for this was that introduction of the scheme was going to reduce the population of their livestock, as the seasonal grazing area was allocated to the permanent irrigation area, from which the livestock would be permanently excluded. Today, the free grazing area is too limited to maintain the previous livestock population. Instead, cut-and-carry feeding systems are used, and the animals are kept in the household compounds. This has reduced both the number of households that keep livestock and the livestock population.

Another reason indicated for farmer resistance was that the irrigated area disrupted communication between villages. Because the area put under irrigation is big and roads across the fields were not included in the construction design, it is not easy to reach villages on the other side of the irrigation area.

The farmers' lack of a sense of ownership of the canals was also indicated by the local agricultural extension workers as a challenge in managing the irrigation scheme. Damage to canals and canal banks – for example, siltation and the accumulation of debris along the secondary and tertiary canals – sometimes caused water to overflow into adjacent fields, and this was frequently cited as a problem. Damage to the canals caused by livestock was also highlighted as a problem.

Maintenance of the tertiary and drainage canals

The total length of the tertiary canals, both lined and unlined, is 112 kilometres, and there are 97 kilometres of drainage canals (see Table 3.2). This indicates a high density of canals in the irrigation area. Furthermore, individual farmers own and cultivate on average less than one hectare. This all makes it a highly complex business, and the internal systems of water flows can easily be disrupted if an individual farmer fails to look after the canals on his farm boundary. The general practice is that each farmer is responsible for clearing the canal of weeds and soil deposits and for maintaining the canal banks adjacent to his plot boundaries. Farmers mentioned that the banks can easily shift during the

cropping season, leading to situations where either the water does not flow properly to the next user or it floods particular areas.

According to the farmers interviewed, farmers who lease irrigation plots over a cropping season often do not care much when it comes to maintaining canal banks. Other reasons mentioned include instability of the banks and shortage of land (leading some farmers to chip away at canal banks and boundaries to expand their area). Monitoring and supervision of these processes is often difficult, as they take place at the micro-level.

Non-uniformity in cropping and water demands Farmers use surface flooding to irrigate their plots. This method of irrigation is wasteful. Farmers in general lack the means to evaluate their current on-farm water-efficiency levels. Furthermore, differences in farmer capacities were indicated as a source of inequality in water use. Depending on their capacity, farmers may choose different crops to plant, having different water demands. This complicates the relationships between farmers. As the farmers indicated, some of them manage to harvest twice during the dry season, while others are able to produce only once. Those who harvest twice often plant fast-growing crops, such as vegetables, which normally have a high water demand. These farmers were generally described as well-off farmers who have the resources.

The leasing of plots, which is practised among the farmers themselves, was also indicated as a reason for the differences in water use. Those who lease out their land were described as farmers who lack other farm inputs, such as labour, oxen or money. Single women or elders are typical examples of such farmers, who lease out land for cash or sharecropping. The lessees, i.e. the tenants, may be relatively better-off farmers or landless young people who have earned cash through off-farm or non-farming activities. In order to pay the cost of the lease and to maximize their returns, these farmers were reported to be generally efficient and their water requirement relatively high. These everyday local-level differences in production capacities entail questions of equitable use and distribution of irrigation water.

Cooperatives unable to convince users about cluster farming and upscaling Theoretically, the irrigation scheme is potentially convenient for the exercise of more efficient land use systems, such as cluster farming, which refers to arranging a production system in which many farmers produce similar crops in a given planting season. Despite such potentials, decisions about crop type, planting dates and usage of water are made at household level, independently of the other households. Farmers recognize the challenges that come with such diversity of practices. Such challenges include 1) different demands for water that sometimes lead to conflicts; 2) high risks of crop loss due to birds and other insects on crops that are not commonly grown;

3) high post-harvest loss due to fragmented crop harvesting (timing, tools, storage) practices; and 4) fragmentation in delivery and marketing practices, which undermines bargaining capacity for better prices.

There are various possible reasons why farmers did not adopt collective alternative irrigation practices. Lack of knowledge and operationalization of the alternative systems is perhaps a major reason. Uncertainty about future land tenure system in collective farming arrangements is another possible reason.

The question of protecting the catchment area of the dam The dam catchment area is about 22,000 hectares. Although the number of people living in the catchment was not ascertained from the local office, some farmers do live and cultivate in the catchment area. Except for those living at the dam site, none of the farmers in the catchment area was displaced. According to the project plan, conservation activities are supposed to be carried out in the catchment area to reduce siltation. As an expert at the Bureau of Agriculture indicated, the dilemma was that the farmers in the catchment area, who were supposed to practise conservation agriculture and approve the closure of the area for rehabilitation of degraded and vulnerable land, did not benefit from the scheme. This has created a rift between the upstream and downstream farmers.

Market outputs and post-harvest challenges The current focus of the irrigation scheme is overwhelmingly on improving access to agricultural inputs. These include water, seeds, fertilizers and extension services. However, initiatives to address output market linkages are sadly lacking. This gap has created insecurity among farmers when it comes to marketing their products at a reasonable profit. ‘Dumping’, especially of perishable products, such as potatoes, which are also bulky, was indicated as a major obstacle. According to informants, a kilo of potatoes was sold for 1 Ethiopian birr (equivalent to 0.05 US cents) in the 2012/13 harvesting season. Shortcomings in transport and storage facilities were other important factors limiting the potential of farmers to uncover better market alternatives.

Related to the market output challenge is the whole chain of post-harvest losses of crops, including harvesting and drying, threshing, transport, on-farm storage and transport to market (Tefera 2012). Poor post-harvest management is a common problem across resource-poor smallholders in Africa, leading to loss of 20–30 per cent, with an estimated monetary value of more than US\$4 billion annually (FAO 2010). Studies on post-harvest losses in the major cereal crops produced by smallholder farmers in Ethiopia indicate a similar percentage of crop losses (Hodges et al. 2011).

Conclusions

This exploratory study addresses the main features and processes involved in irrigation schemes, and some challenges facing their management. The case study presented offers a context where the mainstream development policy is central not only to creating the physical structures (schemes), but also to creating the organizational and institutional set-up to run the schemes. The notion of creating new institutions and organizations, adapting them to the physical and social realities and extending the realm of governance from the domains of formalized decision-making in water allocation into everyday interactions among the local people brings with it an array of issues. These include the role of the state, power inequalities and control over resources. For instance, the political discourse on the need to expand the irrigation infrastructure reinforces the role of the state. One effect of this is that state agencies are heavily engaged in water allocation and distribution. This engagement has become important in water decision-making processes at the scheme level.

The irrigation system involves a plurality of arrangements. Hence, far from being simply a site to access water, the scheme needs to be seen as a site of multiple objectives. While some agencies are tasked with developing the infrastructure, others are responsible for the distribution of water resources. Other actors – such as the Bureau of Agriculture – are involved in promoting new agricultural practices and inputs. In this process, farmers are increasingly drawn into the objectives and arrangements of those powerful actors. A clear trend noted in this study is for farmers to become increasingly dependent on state agencies. For instance, the administration and distribution of water across the whole scheme is performed by the agencies.

Another overarching question is whether formalized and bureaucratic approaches to irrigation management guarantee sustainable use of the resources. The creation and registration of cooperatives, land consolidation and redistribution are all part of the top-down formalization process. These measures can be seen as crucial steps in making sure that the planned irrigation project becomes operational. However, there are limitations to this approach – not least the fact that it does not recognize the local actions of the water users. Everyday activities related to water use, maintenance of canal systems, differences in water demands, etc., were reported by water users as important. Understanding informal negotiation and everyday creativity are at least equally important in reproducing the institutional and organizational arrangements that are neither entirely customary nor wholly bureaucratic, but something new and different.

Beyond the question of improving access to water, large-scale irrigation schemes provide an unusual opportunity to explore potentials for improving

efficiency in land and water use, reducing post-harvest losses and upscaling of marketing systems. Further studies are needed to explore alternatives beyond household-based fragmented irrigation practices. One possible alternative is collective irrigation practices, such as cluster irrigation, in which many farmers produce similar crops across the scheme. Such practices can potentially help farmers to upscale their delivery and marketing systems, and reach potential high-value buyers, such as wholesalers, traders, agro-processors and exporters. Clustering may also improve water use efficiency, as similar crops do have similar water requirements.

To summarize, the major paradox in management is that, while the role of the state in the development and management of the irrigation infrastructure continues to be strong and indispensable, there is a realization that canal and water management should be transferred to the users, in order to reduce the cost of operation and maintenance. Promoting user participation and self-management to ensure good institutional and organizational arrangements that are responsible for the operation and maintenance of the infrastructure, water access and distribution, as well as for financial sustainability for the current and future operational costs, is perhaps the priority issue that needs to be addressed.

Notes

1 The others being protection and rehabilitation of forests for their economic and ecosystem services as carbon stocks; and use of appropriate advanced technologies in industry, transport and buildings.

2 In this sense, engineered and permanent water management systems dedicated to irrigation, with high levels of technology, bureaucracy and material inputs.

3 Ethiopian Sugar Corporation, ethiopiansugar.com/index.php/en/, accessed 9 December 2017.

4 A large dam is defined as any dam above 15 metres in height (measured from the lowest point of foundation to the top of the dam) or any dam between 10 and 15 metres in height which meets at least one of the following conditions: a) the crest length is not less than 500 metres; b) the capacity of the reservoir formed by the dam is not less than 1 million cubic metres; c) the maximum flood discharge

dealt with by the dam is not less than 2,000 cubic metres per second; d) the dam had especially difficult foundation problems; e) the dam is of unusual design. Source: www.icold-cigb.net/, accessed 9 December 2017.

5 Proclamation 85/1994.

6 Proclamations 147/1998 and 402/2004.

7 www.ecpa.org.et/news/.

8 www.waltainfo.com/index.php/explore/13379-fca-establishes-over-7000-cooperatives.

References

- AfDB (African Development Bank) (2001) 'Koga Irrigation and Watershed Management Project: appraisal report', Abidjan, February.
- Atakilte Beyene and E. Sandström (2016) 'Emerging water frontiers in large-scale land acquisitions and implications for food security in Africa', in T. Tvedt and T. Oestigaard

- (eds), *A History of Water: Water and food in Africa*, London: I. B. Tauris, pp. 502–20.
- AwulachewSeleshi Bekele, S. (2010) 'Irrigation potential in Ethiopia: constraints and opportunities for enhancing the system', International Water Management Institute.
- AwulachewSeleshi Bekele, S. and M. Mekonen Ayana (2011) 'Performance of irrigation: an assessment at different scales in Ethiopia', *Experimental Agriculture*, 47(1): 57–69.
- Bues, A. and I. Theesfeld (2012) 'Water grabbing and the role of power: shifting water governance in the light of agricultural foreign direct investment', *Water Alternatives*, 5(2): 266–83.
- Callejo, I. and I. Cossio (2009) 'Institutional aspects of sustainability for irrigated agriculture in arid and semi-arid regions', *Chilean Journal of Agricultural Research*, 69(Suppl. 1): 41–53.
- Carlsson, L. and F. Berkes (2005) 'Co-management: concepts and methodological implications', *Journal of Environmental Management*, 75(1): 65–76.
- Conniff, K., D. Molden, D. Peden and S. AwulachewSeleshi Bekelle (2012) 'Nile water and agriculture: past, present and future', in S. AwulachewSeleshi Bekele, V. Awulachew, D. Smakhtin, D. Molden and D. Peden (eds), *The Nile River Basin: Water, agriculture, governance*, Routledge, pp. 5–29.
- CSA (Central Statistical Agency) (2014) *Land utilization: Private peasant holdings, meher season: Agricultural Sample Survey 2014/2015*, vol. IV, Addis Ababa: Central Statistical Agency of Ethiopia.
- Emana, B. (2009) 'Cooperatives: a path to economic and social empowerment in Ethiopia', CoopAfrica working paper no. 9, Dar es Salaam: International Labour Organization.
- FAO (Food and Agricultural Organization of the United Nations) (2010) 'Reducing post-harvest losses in grain supply chains in Africa: lessons learned and practical guidelines', FAO/World Bank Workshop, FAO Headquarters, Rome, 18/19 March.
- FDRE (Federal Democratic Republic of Ethiopia) (2010) 'Growth and Transformation Plan 2010/11–2014/15', Addis Ababa: Ministry of Finance and Economic Development (MoFED).
- (2011) 'Ethiopia's climate-resilient green economy strategy: the path to sustainable development', Addis Ababa: Environmental Protection Authority of Ethiopia.
- (2014) 'Growth and Transformation Plan. Annual Progress Report for Fiscal Year 2012/13', Addis Ababa: Ministry of Finance and Economic Development (MoFED).
- Fitsum Hagos, F., G. Makombe, R. Namara and S. AwulachewSeleshi Bekelle (2009) 'Importance of irrigated agriculture to the Ethiopian economy: capturing the direct net benefits of irrigation', IWMI Research Report no. 128, Colombo: International Water Management Institute.
- Garces-Restrepo, C., D. Vermillion and G. Munoz (2007) 'Irrigation management transfer: worldwide efforts and results', Rome: Food and Agricultural Organization of the United Nations.
- Gebreaweria Gebregziabher, G., R. Namara and S. Holden (2009) 'Poverty reduction with irrigation investment: an empirical case study from Tigray, Ethiopia', *Agricultural Water Management*, 96: 1837–43.
- Hodges, R., J. Buzby and B. Bennett (2011) 'Postharvest losses and waste in developed and less developed countries: opportunities to improve resource use', *Journal of Agricultural Science*, 149: 37–45.
- Hunt, R. (1988) 'Size and the structure of authority in canal irrigation systems', *Journal of Anthropological Research*, 44(4): 335–55.

- Mehretie Belay and Woldeamlak Bewket (2013) 'Traditional irrigation and water management practices in highland Ethiopia. Case study in Dangila Woreda', *Irrigation and Drainage*, 62: 435–48.
- MoFED (Ministry of Finance and Economic Development) (2006) 'A Plan for Accelerated and Sustained Development to End Poverty', Addis Ababa.
- MoWR (Ministry of Water Resources) (2002) 'Water Sector Development Programme 2002–2016. Irrigation Development Program, main report', Addis Ababa.
- (2006) 'Five Year Irrigation Development Programmme (2005/06–2009/10)', Addis Ababa.
- Oestigaard, T. (2012) 'Water scarcity and food security along the Nile: politics, population increase and climate change', *Current African Issues*, 49, Uppsala: Nordic Africa Institute.
- Ostrom, E. (1990) *Governing the Commons*, New York: Cambridge University Press.
- Rami, H. (2003) 'Ponds filled with challenges: water harvesting – experiences in Amhara and Tigray', Assessment report, Ethiopia: UN Office for the Coordination of Humanitarian Affairs (OCH).
- Scott, J. (1998) *Seeing Like a State: How certain schemes to improve the human condition have failed*, New Haven, CT, and London: Yale University Press.
- Steenbergen, F., A. Mehari Haile, T. Alemehayu, T. Almirew and Y. Geleta (2011) 'Status and potential of spate irrigation in Ethiopia', *Water Resources Management Spate Irrigation Network*, 25(7): 1899–1913.
- Tefera, T. (2012) 'Post-harvest losses in African maize in the face of increasing food shortage', *Food Science*, 4: 267–77.
- Verhoeven, H. (2011) 'Black gold for blue gold? Sudan's oil, Ethiopia's water and regional integration', Briefing Paper, London: Chatham House.

4 | Determinants of Climate-resilient Agricultural Practices among Smallholder Farmers

Nigussie Abadi and Girmay Tesfay

Introduction

Smallholder agriculture in drier agro-ecologies presents high levels of vulnerability conditions. Currently sub-Saharan Africa is home to 76 per cent of the world's ultra-poor (121 million people), who live on less than 50 cents a day (Barrett 2010). Most of these people live in rural areas where agriculture is their primary livelihood strategy (ibid.). However, agriculture is also a major emitter of greenhouse gases (GHGs). Global greenhouse gas emissions derived directly from agriculture amount to approximately 5.1–6.1 gigatons (GT) CO₂ per year (Smith et al. 2007), accounting for 14 per cent of global GHG emissions or 25 per cent if agriculture-driven deforestation is included (Schaffnit-Chatterjee 2011). It has been estimated that around 74 per cent of emissions from agriculture originate in low- and middle-income countries (FAO 2009c) such as Ethiopia.

Recent studies have highlighted the potential for mitigation from this sector (De Boer 2009; FAO 2009a, 2009b; Smith et al. 2007). In fact, agriculture offers tremendous potential for mitigating climate change – 18 per cent of total emissions together with forestry, or one third of the total abatement potential. This makes agriculture/forestry one of the three major areas of GHG abatement opportunities (along with energy efficiency and low-carbon energy supply) (Schaffnit-Chatterjee 2011). Moreover, mitigation efforts in agriculture, such as enhancing soil carbon, could potentially not only offset 24 to 84 per cent of current agricultural climate change, but are also crucial to building a more climate-resilient and sustainable agriculture (Smith et al. 2007).

Accordingly, there has been a growing advocacy in recent years that conservation agriculture' (CA) is important in establishing household food security for poorer farmers in sub-Saharan Africa (SSA). In line with this international call, the Ethiopian government introduced a Climate Resilience Green Economy (CRGE) strategy in 2010 (FDRE 2010). The strategy aims to shift conventional towards more climate-smart agricultural practices, through supporting conservation agriculture, which entails introduction of zero or minimum tillage, water shed management (WSM) and nutrient and crop management. It aims

to reduce carbon emissions from agriculture by 40 million tonnes (Mt) in 2030 and to reverse the effects of declining soil fertility and productivity on current farming systems.

However, from an economic point of view, the implementation of changes in farming practices to sequester carbon in soils would be a cost to smallholder farmers, while the benefits would largely accrue to the wider public. As a result, compensation would need to be provided to smallholder farmers if they are to change their farming practices to mitigate climate change (Shaikh et al. 2005). To this end, there have been calls to include incentives for emissions reductions in agriculture in developing countries within a future climate change treaty (FAO 2009b; World Bank 2007). However, despite the recognition of the potential importance of CA in the world, there is little solid empirical research that documents incentive mechanisms (payments or subsidies) that would promote adoption of conservation farming among farmers.

This chapter aims to address the following questions: Are smallholder farmers in Ethiopia willing to adopt conservation agriculture technology? What is the extent of willingness to adopt the technology? Why are some farmers willing to adopt CA but not others? More importantly, what are the challenges of adopting CA technology, given the nature of Ethiopian farmers' socio-economic and natural endowments?

The overall goal of this chapter is to answer some of the questions in order to provide a better understanding of the potential uptake of CA² technology and to identify constraints that might be limiting its diffusion. Our chapter focuses on three specific objectives. First, we seek to provide a profile of farm households' willingness to adopt specific CA practices or not. Second, we estimate the overall willingness to adopt specific CA technology. Third, we identify the determinants of willingness to accept and the extent of willingness regarding specific CA technology in order to measure those factors that influence farmers' options when choosing specific tillage practices.

The scope of the study is limited to dryland areas in northern Ethiopia. Although CA could be used in other climatic regions of Ethiopia, the specific attributes of the technology considered refer primarily to dryland agriculture. In this regard, the selected technologies entail the following potential attributes: the potential to expand the practice to sequester atmospheric carbon (McCarl and Schneider 2001); and the potential to increase smallholder farms' resilience to rainfall variability, address soil degradation, and increase food production in an efficient, productive and profitable manner (Hobbs et al. 2008).

The transition from conventional to conservation farming is not straightforward for the following reasons. First, there is uncertainty about the costs of conservation farming and the actual yields as compared to conventional farming. Second, some returns in terms of yield increase from conservation farming will accrue in the distant future, causing disruptions in income flows

that could increase the incentive demanded. And third, landowners have varying preferences regarding conventional farming versus conservation farming. Non-market values and risk attitudes play a significant role in farming decisions, so compensation set equal to carbon storage may not be sufficient to convince landowners to switch from conventional farming to conservation farming. Information from a contingent valuation survey is valuable in this context, because it is able to incorporate non-market values and risk attitudes, as well as unobservable transactions costs, in the compensation amount (Shaikh et al. 2005). To this end, our survey explicitly asked landowners about their willingness to accept (WTA) compensation for participation in a CA programme. The purpose is to compare the costs of climate mitigation in agriculture when compensation demanded is used instead of using a predetermined carbon price. This helps to determine if conservation agriculture is a cost-effective means of achieving food security and climate change mitigation for dryland agriculture in Ethiopia.

Why is conservation agriculture relevant for the Ethiopian highlands?

Tigray is the northernmost region of Ethiopia and covers an area of 53,000 square kilometres (Fitsum et al. 1999). Tigray's population is around 4.3 million and growing at 2.5 per cent annually, with 80.5 per cent residing in rural areas (CSA 2007). Administratively, the region has 35 *woredas*, 12 town *woredas* and 665 *tabias*. Each *woreda* is subdivided into *tabias* and each *tabia* is divided into *kushets* (Babulo 2007). The region is relatively dry and is subject to frequent drought (Howard and Smith 2006). Average annual rainfall ranges between 500 and 900 mm per year, with a unimodal pattern except in the southern and eastern highlands, where a second, smaller rainy season allows growing of two successive crops within one year (Nyssen et al. 2004). Taking into account rainfall, atmospheric temperature and evaporation, more than 90 per cent of the region is categorized as semi-arid (Taffere 2003). Floods, drought and other changes in the country's natural and environmental system due to climate change threaten the performance of the economy as a whole and are the main cause of severe malnutrition and loss of livelihoods for households, particularly in marginal and less productive areas of the country, such as Tigray (PANE 2009). Rainfall patterns are characterized by high spatial and temporal variability, and by frequent occurrence of drought. Poor soil quality and moisture stress are the two major constraints on agricultural productivity in Tigray. Studies indicate that the soils in the highlands of Tigray are deficient in major soil macronutrients and organic carbon (Mitiku and Kindeya 2001).

A number of studies indicate that environmental degradation and the deterioration of the natural resource base have become serious problems in Ethiopia, mainly in the Ethiopian highlands. For instance, on the basis of the Ethiopian Highland Reclamation Study (EHRS) (FAO 1986), by the mid-1980s

about half of the highland area (27 million hectares) was ‘significantly eroded’. Fourteen million hectares were ‘seriously eroded’ and over two million hectares were described as ‘beyond the point of no return’. The physical gross annual soil loss was estimated at between 42 and 103 tons per hectare per year (ibid.). In the absence of soil and water conservation measures, the rate of mean annual soil loss from cropland is estimated to be 57 tons per hectare per year (Desta et al. 2006). It was estimated that in 1990 alone, 57,000 to 128,000 tons of grain production was lost owing to reduced topsoil depth caused by soil erosion (Demel 2001). Therefore, approaches that aim to transform the agricultural system should consider these environmental challenges. Promotion of ecologically sound agricultural practices, such as CA, is a precondition for sustained economic growth.

Survey design and administration

A questionnaire was sent in 2014 to 330 farmers randomly selected from three districts in the Tigray regional state of Ethiopia. Farmers with no land were omitted from the survey sample since farmers without land were unlikely to participate in the conservation agriculture practices.

The survey included a brief personalized covering letter explaining the purpose of the questionnaire; and a definition of conservation agriculture practices, such as minimum tillage (MT), zero tillage (ZT) and carbon offset credits. In addition to willingness to accept compensation for changing conventional tillage into conservation tillage, the survey also elicited detailed information on a farmer’s agricultural operations, including opinions about and awareness of climate change issues and carbon credits. Data on personal characteristics and demographics were also gathered. Farmers were informed about conservation farming and its benefits. Among the benefits elaborated were minimization of tillage and disturbance of soil; reduction of erosion and pollution of soil and water; reduction of long-term dependency on external inputs; improving water quality and water use efficiency; and reduction of greenhouse gases.

The first series of questions in the survey was meant to reduce information biases by familiarizing respondents with the topic and issues under investigation before asking them about their willingness to accept specific conservation farming practices. Landowners were presented with a hypothetical climate-smart agriculture programme aiming at mitigating climate change and achieving food security through promotion of conservation farming practices such as MT and ZT while also compensating for the loss of agricultural production in the initial stage.³ They were also informed that the programme would give training and equipment for using specific farming practices to ensure that they entered into a five-year commitment to adopt a particular tillage system.

This was followed by a question about whether the landowner would consider enrolling the whole or parts of their agricultural land given sufficient compen-

sation in the Climate Smart Agriculture programme (CSA). This was then followed by an open-ended question about the approximate land (measured in the local unit *tsimdi*) the respondent would like to allocate to the programme and the minimum compensation payment they would demand for the area they set aside for the specified conservation tillage practice. However, farmers were also informed that only a limited number of households in the village would be selected and the smaller the amount of compensation they required to participate in the programme, the higher their chances of being selected.

Methodologically, it was challenging to ask landowners about their willingness to accept (WTA) in the contingent valuation (CV) format we used. One problem we discussed was the difficulty for farmers to conceptually combine both a rough estimate of yield loss were they to adopt conservation tillage and their own preferences for conventional versus conservation tillage practices. Another challenge, sometimes raised in the CV literature, is potential strategic bias. Although we explicitly stated that the answers would not be used to calculate actual compensation, and the programme would enrol only a few households and the smaller the amount of compensation they required to participate in the programme, the higher their chances of being selected, we cannot rule out that some landowners may have answered strategically by inflating WTA responses.

Modelling the decision to convert conventional farming into conservation farming

In this study, a discrete-choice random utility maximization (RUM) framework is used to model the decision of a landowner to convert conventional farming into conservation farming. The landowner will accept compensation to adopt conservation tillage (CT) as long as the compensation offered is at least as much as the opportunity cost of changing tillage practice, plus any positive or negative non-market benefits that he/she gets from conservation tillage. This decision can be modelled as follows: Landowner *i* will accept conservation tillage ($a = 1$) as long as $v_{i,1}(m+\Delta m, \mathbf{s}) + \varepsilon_{i,1} > v_{i,0}(m, \mathbf{s}) + \varepsilon_{i,0}$, where Δm is the compensation offered minus forgone expected annual net returns from conventional tillage (opportunity cost, OC). Since utility is a random variable, the probability of a farmer choosing to accept the bid can be written (suppressing subscript *i*) as (Hanemann 1984; Greene 2000):

$$\Pr(a=1) = \Pr\{v_1(m+\Delta m, \mathbf{s}) + \varepsilon_1 > v_0(m, \mathbf{s}) + \varepsilon_0\} = \Pr\{(\varepsilon_1 - \varepsilon_0) > -[v_1(m+\Delta m, \mathbf{s}) - v_0(m, \mathbf{s})]\}. \quad (1)$$

Replacing $[v_1(m+\Delta m, \mathbf{s}) - v_0(m, \mathbf{s})]/\sigma$ with Δv and $(\varepsilon_1 - \varepsilon_0)/\sigma$ with ε , where $\varepsilon \sim N(0,1)$ is i.i.d. because ε_1 and ε_0 are i.i.d., yields the probit model:

$$\Pr(a=1) = \Pr(\varepsilon > -\Delta v) = F_\varepsilon(\Delta v), \quad (2)$$

where F_ε is the normal cumulative distribution function (cdf).

The decision to accept the proposed compensation is based on the returns from the parcel of land that the landowner would commit to conservation tillage. Thus, the landowner will compare $v_1(m+B-OC, s)$ against $v_0(m, s)$, where B is the compensation and OC is the opportunity cost of forgone agricultural production on a per-acre basis and $\Delta m = B - OC$. While the opportunity cost represents forgone agricultural net returns from accepting conservation tillage, the total compensation required by the farmer may be increased by other non-market values associated with keeping the land in conventional tillage. Possible examples of this are that the landowner may prefer conventional tillage or feel a commitment to adopt technology already familiar from previous experiences. Compensation demanded is also affected by landowners' perceptions about the risk of reduced value of fixed annual payments (at least over the contract period) and the risk of increased prices for agricultural inputs and services (assuming these develop) after the initial contract period.

However, while the willingness to adopt conservation agriculture can be modelled in a single equation, modelling the extent of compensation for conservation agriculture in a single equation creates a selection bias. The extent of compensation is conditional first on willingness to adopt conservation agriculture, and therefore there is a need to control for the factors that affect adoption before assessing determinants of the extent of compensation. Single-equation approaches to these types of problem fail to capture the logical two-step decision process that potential participants undertake (Lohr and Park 1995). We therefore employ a two-step discrete continuous modelling approach to capture this decision-making. Specifically, we use a two-step Heckman sample selection-correction model (Heckman 1979), where we first model the willingness to adopt conservation agriculture and then, conditional on the willingness to adopt conservation agriculture, assess the determinants of the intensity of adoption in the second stage:

$$Y_i = X_i\beta \text{ if } i^* = X_{2i}\beta_2 + \mu_i > H, \quad (3)$$

$$Y_i = 0 \text{ if } i^* = X_{2i}\beta_2 + \mu_i < H,$$

where i^* is the probability of willingness to adopt conservation agricultural practices, i^* is the unobservable latent, H is the unobservable threshold value, and X_i and X_{2i} are the independent variables that are used to explain the extent of compensation needed.

As explained in the empirical model above, two sets of dependent variables, for selection and outcome equations, were chosen for statistical analysis. The dependent variable (willingness) for the selection equation was binary in nature, taking the value of '1' if landowners were willing to adopt conservation tillage given compensation, and '0' if otherwise. Similarly, the dependent variable (intensity of conservation farming) for the outcome equation was also designed as a continuous variable.

The independent variables contained in the selection and outcome equations were grouped into three categories: socio-demographic variables, factor endowments, and access to institutional factors. The first category included variables that capture socio-demographic variables such as: gender, age, education, family size, extent of hired labour and distance to markets. Since landowners' willingness to accept conservation tillage or not was likely to be guided by their socio-demographic conditions, it was assumed that these variables could determine landowner willingness to accept conservation tillage. The definition and descriptive statistics of all variables are presented in Table 4.1. On the vector of socio-demographic variables, *gender* was expected to have a positive relationship with the outcome dependent variable because male-headed households tend to have more social ties compared to their women-headed counterparts, and women are in general more risk averse than men (Jianakoplos and Bernasek 1998). Similarly, the variable *age* was expected to have a negative association with landowner willingness to accept conservation tillage. This was possibly because older farmers tend to have shorter planning horizons (Gould et al. 1989), tend to be risk averse (Mazvimavi and Twomlow 2009) and are more dogmatic in farming practices, and it is difficult to induce them to change their mindset regarding existing agricultural practices (Kumar et al. 2010). With higher levels of education, it would be easier for the operators to obtain and understand information with respect to the applicability of CT to their farming decision and determine the potential impacts on long-run profits (Gould et al. 1989). Hence, a positive association of the variable *education* with landowner willingness to accept climate-smart agricultural practices such as conservation tillage was expected. For larger families, where labour is sufficiently available, adoption of CT may not bring much benefit, especially in resource-poor areas (Kumar et al. 2010). Therefore, a negative association of the variable *family size* with landowners' willingness to accept conservation farming was expected. *Model farmer* was used to represent the importance of government recognition of progressive farmers' willingness to accept conservation tillage. It takes a value of '1' for those landowners who were recognized as model farmers by local administration bodies and '0' if otherwise. While progressive farmers are keener to adopt new technology, they may also need confirmation or verification to ensure conservation tillage is useful and profitable (Hussain et al. 2010). Therefore, model farmers' significance in terms of willingness to accept CSA was uncertain and had to be found empirically.

The second category of variables included factor endowments such as size of land (*land*), livestock in Tropical Livestock Units (TLUs) (*livestock*), household expenditure per adult equivalent (*expenditure*) and hired labour (*labour*). All variables were measured on a continuous scale. Earlier research indicated that landowners owning larger tracts of agricultural land have a greater output over which to spread the cost of new technology; therefore it is economically more

viable for them to adopt earlier as compared with small farms, *ceteris paribus* (Davey and Furtan 2008). Moreover, large land size also implies that farmers can diversify into other crops and reduce the inherent risk in agricultural production (Persevearance et al. 2012). Hence, a positive association of the variable *land* with landowner willingness to accept climate-smart agricultural practices such as conservation tillage was expected. While farm households with more livestock may give priority to reserving crop residue for livestock as feed rather than preserving it for use as mulch on conservation farming plots (Mazvimavi and Twomlow 2009), farmers with access to draught power may be reluctant to practise most components of conservation farming as they can opt for a conventional draught animal tillage system. Therefore, the sign of *livestock* in terms of willingness to accept CSA was uncertain and had to be found empirically. Similarly, the variable *expenditure* was expected to have a positive relationship with the outcome-dependent variable because conservation tillage involves some potential yield loss and investment in new technologies (Wang et al. 2010). Therefore farmers with less wealth may be less willing to accept conservation tillage. A major reason for adopting conservation tillage, in addition to its effect on soil loss, is the lower labour requirements when compared to traditional cultivation methods. This characteristic could be important for the producer who hired labour. Therefore, the variable *hired labour* was expected to have a positive relationship with the willingness to accept conservation tillage practices.

The third category was composed of institutional variables such as credit, the Productive Safety Net Programme (PSNP), extension services, access to irrigation services and institutional membership. Earlier research (Hussain et al. 2010) indicated that agricultural farms where the groundwater is not fit for irrigation have a great inducement to adopt the MT system because poor quality of water requires the farmers to adopt water conservation technologies. Therefore, *irrigation*, which was assigned a value of '1' for those farmers who have access to irrigation and '0' if otherwise, was also expected to have a negative association with both sets of dependent variables.

Extension was used to represent the importance of extension services as a source of technical back-up in willingness to accept conservation tillage by the landowners. It takes a value of '1' for those landowners who had access to extension services in farming and '0' if otherwise. Since access to a government agricultural extension service can be a learning tool, a positive association was expected between the variable *extension* and both sets of dependent variables. Similarly, adoption of CT is hypothesized to be related to information and learning variables such as membership in a farmer group. It takes a value of '1' for those landowners who were a member of a farmers' group in their village and '0' if otherwise. *Membership* in a farmers' group is therefore expected to contribute positively to the willingness to accept conservation tillage. Moreover,

previous research (Wang et al. 2010) indicated that families who have more members in the off-farm labour market look for ways to save labour and thus adopt conservation tillage more often. PSNP, which is a public works programme run by the government, was included to capture how access to off-farm work could affect the willingness to accept conservation tillage. PSNP was binary in nature, taking the value of '1' if a landowner is targeted for the public works programme and '0' if otherwise, and was also expected to have a positive association with both sets of dependent variables.

Results and discussions

Descriptive statistics results Table 4.1 and Table 4.2 present the definitions and sample statistics of the variables used in the analysis. Also presented in the tables are the difference in means of the variables used in the econometric analyses along with their significance levels. The significance levels suggest that there are some differences between households willing and not willing to adopt conservation tillage with respect to many variables. Out of the total 330 sample households, 53.3 per cent and 43.6 per cent were willing to accept MT and ZT respectively. Concerning the descriptive statistics of the variables that were expected to influence the willingness to adopt MT and ZT, there appear to be statistically significant differences in gender, age of the household head, ownership of land, household expenditure, access to institutional support in terms of credit, PSNP, irrigation and information related to climate change. There were also significant differences in organizational affiliation, being a model or progressive farmer, having an official position in the village and distance to a local market on households' willingness to adopt zero tillage.

An interesting observation is that willingness to adopt zero tillage is closely related to the use of hired agricultural labour. Thirty-nine per cent of the households willing to adopt zero tillage hired labour while the corresponding figure for non-willing households was 13 per cent. This confirms that conservation tillage might reduce labour usage as compared to conventional tillage. Gender and age of the household head were also significant determining factors on willingness to adopt zero tillage. On average, 87 per cent of the households willing to adopt zero tillage tend to be male-headed. One explanation for this is that male-headed households tend to have more social ties compared to their women-headed counterparts and women are in general more risk averse than men (Jianakoplos and Bernasek 1998). Thus, one would expect the risk premium to be smaller for men than for women. But the evidence confirms that male-headed households tend to take higher risks in their farming practices.

Many researchers argued that younger farmers may exhibit a higher likelihood of adopting conservation farming than their older counterparts (Amir 2006), possibly because older farmers tend to have shorter planning horizons (Gould et al. 1989), tend to be risk averse (Mazvimavi and Twomlow 2009)

Variable name	Willing (n = 144)	Not willing (n = 186)	p-value*
	Mean (SE)	Mean (SE)	
Gender of the household head (= 1 if male, 0 otherwise)	0.87 (0.03)	0.78 (0.03)	0.0509*
Age of the household head in years	49.8 (1.09)	46.6 (0.91)	0.0226**
Educational level of the household head in years	3.25 (0.28)	3.04 (0.25)	0.5848
Family size of the household	6.10 (0.18)	5.78 (0.16)	0.1858
Size of land owned in tsimdi (= 0.25 ha)	5.00 (0.23)	3.31 (0.18)	0.0000***
Number of livestock owned in TLU	7.54 (0.19)	7.00 (0.18)	0.0407**
Model farmer (= 1 if the household head is a model, 0 otherwise)	0.38 (0.41)	0.24 (0.03)	0.0067***
Awareness of climate change (= 1 if the household is aware of CC)	0.76 (0.04)	0.74 (0.03)	0.6536
Hired labour	0.39 (0.04)	0.13 (0.03)	0.0000***
Distance to local market in minutes	55.8 (3.78)	71. 6(3.78)	0.0039***
Distance to major market in minutes	127 (4.18)	124 (3.68)	0.5699
Distance to DA office in minutes	44.7 (3.72)	50.0 (3.09)	0.2844
Access to agricultural extension (= 1 if yes , 0 otherwise)	0.97 (0.02)	0.96 (0.01)	0.8890
Access to irrigation (= 1 if yes , 0 otherwise)	0.53 (0.04)	0.38 (0.04)	0.0040***
Access to extension service related to climate change (=1 if yes)	0.43 (0.05)	0.28 (0.03)	0.0089***
PSNP (= 1 if the household is beneficiary of PSNP)	1.82 (0.21)	2.18 (0.08)	0.0770*
Access to credit (=1 if yes, 0 otherwise)	0.76 (0.07)	0.60 (0.04)	0.0246**
Official position (= 1 if yes, 0 otherwise)	0.51 (0.04)	0.40 (0.04)	0.0681*
Membership in an organization (= 1 if yes, 0 otherwise)	0.43 (0.04)	0.75 (0.32)	0.0000**

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

Table 4.1 Mean separation tests of households willing to accept no-till and not willing to accept

Variable name	Willing (n= 144)	Not Willing (n= 186)	p-value*
	Mean (SE)	Mean (SE)	
Gender of the household head (= 1 if male, 0 otherwise)	0.87 (0.03)	0.78(0.03)	0.0509*
Age of the household head in years	49.8(1.09)	46.6(0.91)	0.0226**
Educational level of the household head in years	3.25(0.28)	3.04(0.25)	0.5848
Family size of the household	6.10(0.18)	5.78(0.16)	0.1858
Size of land owned in tsimdi (= 0.25 ha)	5.00(0.23)	3.31(0.18)	0.0000***
Number of livestock owned in TLU	7.54(0.19)	7.00(0.18)	0.0407**
Model farmer (= 1 if the household head is a model, 0 otherwise)	0.38(0.41)	0.24(0.03)	0.0067***
Awareness of CLIMATE CHANGE (= 1 if the household is aware of CC)	0.76(0.04)	0.74(0.03)	0.6536
Hired labour	0.39(0.04)	0.13(0.03)	0.0000***
Distance to local market in minutes	55.8(3.78)	71.6(3.78)	0.0039***
Distance to major market in minutes	127(4.18)	124(3.68)	0.5699
Distance to DA office in minutes	44.7(3.72)	50.0(3.09)	0.2844
Access to agricultural extension (= 1 if yes, 0 otherwise)	0.97(0.02)	0.96(0.01)	0.8890
Access to irrigation (= 1 if yes, 0 otherwise)	0.53(0.04)	0.38(0.04)	0.0040***
Access to extension service related to climate change (= 1 if yes)	0.43(0.05)	0.28(0.03)	0.0089***
PSNP (= 1 if the household is beneficiary of PSNP)	1.82(0.21)	2.18(0.08)	0.0770*
Access to credit (= 1 if yes, 0 otherwise)	0.76(0.07)	0.60(0.04)	0.0246**
Official position (= 1 if yes, 0 otherwise)	0.51(0.04)	0.40(0.04)	0.0681*
Membership in an organization (= 1 if yes, 0 otherwise)	0.43(0.04)	0.75(0.32)	0.0000**

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

Table 4.2 Mean separation tests of households willing to accept minimum tillage and not willing to accept

and are more dogmatic in farming practices, and it is difficult to induce them to change their mindset regarding existing agricultural practices (Kumar et al. 2010). In contrast to this traditional view, our results indicated that older farmers are more willing to adopt zero tillage than their younger counterparts are. Our finding is similar to those of Mazvimavi and Twomlow (2009). Furthermore, households willing to accept MT and ZT have a significantly larger landholding than their non-willing counterparts do. Landowners owning larger tracts of agricultural land have a greater output over which to spread the cost of new technology (Davey and Furtan 2008). Table 4.1 and Table 4.2 also show that the total expenditure of those households willing to accept MT and ZT was significantly higher than of those who did not. This could possibly be because CT technology involves some potential yield loss and investment in new technology (Wang et al. 2010).

The results indicated above simply compare mean differences in the outcome variables and other household variables between landowners who were willing to accept conservation tillage and those who were not. They show that landowners who were willing to accept conservation tillage practices were generally better off than those who were not. To this end, multivariate approaches that account for selection bias arising from the fact that landowners who were willing to accept conservation tillage and those who were not may be systematically different. These differences are essential in providing sound estimates of the determinant and intensity of willingness to accept conservation tillage. The following section explores these.

Econometric results and discussions Table 4.3 and Table 4.4 present the results of a Heckman selection model for minimum tillage (MT) and no tillage (NT) respectively. The correlation between the error terms and the WTA of MT and NT in Tables 4.3 and 4.4 is significant. This indicates a problem of selection bias, which justifies the use of the Heckman selection model for willingness to accept MT and ZT. The Wald χ^2 test is also significant, so the null hypothesis stating that all variables can be jointly excluded can be rejected, confirming that the model fits well. Many of the coefficients of the control variables in the equations (column 1 of Table 4.3 and Table 4.4) are statistically significant. For example, older farmers were more willing to accept minimum tillage and no tillage than their younger counterparts. This is contrary to our expectation. However, as farmers grow older, they become more skilful, through learning-by-doing (Mazvimavi and Twomlow 2009). In addition, a farmer who is involved in farming for a longer time may be more aware of how soil fertility is decreasing and its negative effect on yield over time. Hence, older farmers are more conscious of the benefits of conservation farming and tend to be more willing to accept conservation tillage (Kumar et al. 2010). Similarly, education of the household head significantly increases

Variable definition	Selection equation	Outcome equation
Age of the household head	0.018** (0.009)	0.017** (0.008)
Education of the household head in years	0.066* (0.035)	0.044 (0.032)
Gender of the household head (= 1 if Male, 0 otherwise)	-0.042 (0.255)	0.008 (0.245)
Family size of the household	0.626** (0.273)	0.065 (0.143)
Model farmer (= 1 if model, 0 otherwise)	0.162 (0.160)	-0.164 (0.199)
Distance to local market in minutes	-0.005** (0.002)	-0.004** (0.002)
Awareness of climate change (= 1 if yes, 0 otherwise)	0.075** (0.022)	0.048 (0.207)
Land owned by the household in tsimdi	0.170*** (0.047)	0.167*** (0.045)
Number of livestock owned in TLU	-0.586** (0.271)	-0.019 (0.138)
Total household expenditure	0.157*** (0.000)	0.001** (0.001)
Hired labour	0.574* (0.316)	0.119 (0.247)
Dummy if the household is targeted for PSNP (= 1 if yes, 0 otherwise)	0.706** (0.345)	0.195 (0.241)
Access to irrigation (= 1 if yes, 0 otherwise)	-0.147 (0.096)	-0.322 (0.364)
Access to credit (= 1 if yes, 0 otherwise)	0.003 (0.002)	0.002 (0.003)
Access to extension service (= 1 if yes, 0 otherwise)	-0.018 (0.481)	0.058 (0.472)
Membership of a farmers' group (= 1 if yes, 0 otherwise)	-0.917*** (0.200)	0.137*** (0.185)
Official position in village/tabia (= 1 if yes, 0 otherwise)	-0.127 (0.204)	0.106 (0.152)
Constant		0.626 (0.182)
Rho	-0.734* (0.224)	

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

Table 4.3 Regression results of willingness to accept minimum tillage (Heckman results)

Variable definition	Selection equation	Outcome equation
Age of the household head	0.015* (0.008)	0.017** (0.008)
Education of the household head in years	0.016 (0.030)	0.044 (0.032)
Gender of the household head (= 1 if male, 0 otherwise)	0.023 (0.243)	0.008 (0.245)
Family size of the household	0.381 (0.261)	0.065 (0.143)
Model farmer (= 1 if model, 0 otherwise)	0.162 (0.160)	-0.164 (0.199)
Distance to local market in minutes	-0.001 (0.002)	-0.004** (0.002)
Awareness of climate change (= 1 if yes, 0 otherwise)	0.624** (0.285)	0.048 (0.207)
Land owned by the household in tsmidi	0.170*** (0.047)	0.167*** (0.045)
Number of livestock owned in TLU	-0.586** (0.271)	-0.019 (0.138)
Total household expenditure	0.157*** (0.000)	0.001** (0.001)
Hired labour	0.702** (0.295)	0.119 (0.247)
Dummy if the household is targeted for PSNP (= 1 if yes, 0 otherwise)	0.193 (0.322)	0.195 (0.241)
Access to irrigation (= 1 if yes, 0 otherwise)	-0.147 (0.096)	-0.322 (0.364)
Access to credit (= 1 if yes, 0 otherwise)	0.002 (0.003)	0.002 (0.003)
Access to extension service (= 1 if yes, 0 otherwise)	-0.203*** (0.199)	0.058 (0.472)
Membership of a farmers' group (= 1 if yes, 0 otherwise)	-0.818*** (0.179)	0.137*** (0.185)
Official position in village/ <i>tabia</i> (= 1 if yes, 0 otherwise)	0.190 (0.148)	0.106 (0.152)
Constant		0.626 (0.182)
Rho	-0.734* (0.224)	

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

Table 4.4 Regression results of willingness to accept zero tillage (Heckman results)

the probability of willingness to accept MT, but the impact is significant for NT. With higher levels of education, it would be easier for the operators to obtain and understand information with respect to the applicability of CT to their farming environment and determine the potential impacts on long-run profits (Gould et al. 1989). An interesting observation is the significant and positive effect of awareness about climate change on willingness to accept MT and ZT technologies. This is likely because with awareness of climate change farmers might use difference adaptation strategies, including conservation farming practices.

Most importantly, our Heckman selection model results show that the willingness to accept CA is affected by the factor endowments at the household level. For example, farmers with larger plot size were also more likely to be willing to accept MT and ZT. The results are supported by similar studies on the effect of farm size and technology adoption, where Mazvimavi and Twomlow (2009), Gould et al. (1989) and Kumar et al. (2010) have all concluded that the bigger the plot size, the greater the chances of adopting CA. This is mainly because farmers with large tracts of arable land have the opportunity to spare some sections to try out new practices at less risk, and large land size implies that farmers can diversify into other crops and reduce the inherent risk in agricultural production (Persevearance et al. 2012). Similarly, ownership of livestock will constrain the willingness to accept minimum tillage. This finding is consistent with the fact that farmers with access to draught power may give priority to reserving crop residue for livestock feed rather than using it as mulch on conservation farming plots (Mazvimavi and Twomlow 2009)

In Table 4.3 and Table 4.4 the coefficient of the variable *expenditure* (which is positive and significant) suggests that rich farmers were more likely to be willing to accept conservation agriculture technology than poor ones. This suggests that, keeping other factors constant, a policy that seeks to assist farmers in financing their initial adoption indeed appears to enhance the willingness to accept conservation tillage practices. The coefficient of the variable measuring for *hired labour* is positive and statistically significant in the willingness to accept both ZT and MT technology. This finding is consistent with the fact that CT technology is labour-saving. Hence, factor endowments appear to be one of the most important determinants of the willingness to accept conservation tillage.

Interestingly, the coefficient of access to irrigation was significant but negative for both MT and ZT, providing support for the notion that conservation agriculture saves water and increases water use efficiency; it might also indicate that farmers with access to irrigation are already diversified towards high-value vegetables.

Mean WTA measures for conservation tillage In order to derive an estimate of how much it would cost to reach climate change mitigation through conservation tillage technologies, we first calculate and report the mean WTA for the two conservation tillage practices, i.e. for minimum tillage (MT) and zero tillage (ZT). The mean minimum compensation for accepting MT and ZT was found to be 2,400 birr (US\$117) and 3,750 birr (US\$183) per tsmad^{4/} year respectively. McCarthy et al. (2011) estimated the cost of investment and maintenance for minimum tillage in Ghana at US\$220 and US\$212 per hectare per year respectively, while investment and maintenance costs for medium-scale no tillage were US\$600 and US\$400 per hectare per year respectively. Given this, the WTA minimum compensation for a voluntary agro-environmental service in Ethiopia to mitigate climate change is higher than the actual investment and maintenance costs in Ghana and Morocco.

Conclusion and policy recommendations

This chapter has made a rare contribution to the analysis of Ethiopian smallholder farmers' preferences and willingness to accept conservation tillage and enrol their agricultural land in a voluntary Climate Smart Agriculture (CSA) programme. We have shown how, in principle, their WTA can be defined as a sum of compensation for yield reduction at the initial stage of adopting and a non-market welfare measure depending on farmers' preferences for conventional versus conservation tillage. The theoretical approach is developed to link the CV approach we use to analyse WTA with the standard valuation literature. We then conducted a representative CV survey of 330 smallholder farmers in the three districts of the Tigray regional state of Ethiopia, analysing the factors determining WTA conservation agriculture and its intensity, and deriving mean WTA. These results show that about 53 and 43 per cent of the landowners are willing to participate in (adopt) minimum and zero tillage practices respectively. Using a rich dataset, we further found that WTA conservation tillage is negatively related to ownership of livestock, irrigation, distance to local market, extension services and membership of a farmers' group, and positively related to age and education of the head of the household, awareness of climate change in the household, ownership of land and income, hired labour and off-farm income such as PSNP. These findings show that, while incentives offered to farmers influence willingness of landowners to adopt or participate in climate-smart agricultural practices, they are clearly not the sole driver of the participation decision. Increasing the annual payment may induce participation but other changes to the programme may be necessary as well.

The model results also identified potential constraints on conservation tillage adoption in the region, such as shortage of livestock feed. This suggests that the specific characteristics of the mixed crop/livestock farming systems hinder

further diffusion of conservation tillage. These structural features of the farming system, which appear to be constraining adoption of new technologies, require broad-based approaches that systematically provide alternative solutions to the constraints that farmers face.

We also found indications that landowners in the region demanded higher compensation sums, and the overall mean WTA per year per *tsimad* of land was estimated at ETB 2,400 (US\$117) and ETB 3,750 (US\$183) for minimum and zero tillage respectively. Methodologically, it was challenging to ask landowners their WTA in the CV format we used. One problem we discussed was the difficulty forest owners had in conceptually combining both a rough estimate of yield loss when they adopt conservation tillage and their own preferences for conventional versus conservation tillage practices. This could result in potential uncertainty in WTA responses. Another challenge, sometimes raised in the CV literature, is potential strategic bias. Although we explicitly stated that the answers would not be used to calculate actual compensation, we cannot rule out that some landowners may have answered strategically by inflating WTA responses.

In general, the findings of the econometric model were consistent with the theoretical expectations and findings from previous studies in adoption literature. These findings are critical for researchers and extension agents planning and disseminating practices of conservation agriculture. In order to achieve maximum adoption, effective targeting of the population as well as packaging of information is necessary in order to match potential technologies with the socio-economic set-up of target farmers. Generalized information dissemination without prior consideration of the observed relationships is likely to lead to non-adoption.

Notes

1 Conservation agriculture is a cropping systems management approach that entails three principles : (1) reduced soil disturbances, (2) residue retention on the soil surface, and (3) crop rotations and associations (FAO 2002).

2 Adoption of CA includes the adoption of multiple technologies in the form of a package. Consequently, complete adoption of a package of full CA technologies could be costly in the developing countries. Further, adoption levels are low in Ethiopia and farmers often use only some components on small portions of their land. This study therefore focuses on adoption of selected

CA technologies that are most common in developing counties, such as zero and minimum tillage.

3 Conservation tillage usually leads to lower yields in early years before soil nutrients build up (Kurkalova et al. 2006).

4 One *tsimad* is equal to 0.25 ha.

References

- Amir, T. (2006) 'How to define farmers' capacity', *Agricultural Economic Journal*, 236(3): 261–72.
- Babulo, B. (2007) 'Economic valuation and management of common-pool resources: the case of enclosures in

- the highlands of Tigray, Northern Ethiopia', Unpublished PhD thesis, Katholieke Universiteit Leuven.
- Barrett, C. (2010) 'Food systems and the escape from poverty and ill-health traps in sub-Saharan Africa', in P. Pinststrup-Anderson (ed.), *The African Food System and Its Interactions with Human Health and Nutrition*, Ithaca, NY: Cornell University Press.
- CSA (Central Statistical Agency) (2003) 'Ethiopia Demographic and Health Survey', Addis Ababa: Central Statistical Agency of Ethiopia.
- (2007) 'Population and Housing Census of Ethiopia', Administrative report, Addis Ababa: Central Statistical Agency of Ethiopia.
- Davey, K. and W. Furtan (2008) 'Factors that affect the adoption decision of conservation tillage in the Prairie Region of Canada', *Canadian Journal of Agricultural Economics*, 56: 257-75.
- De Boer, Y. (2009) 'UNCCD Land Day: Address by Yvo de Boer, Executive Secretary United Nations Framework Convention on Climate Change', Bonn, 6 June.
- Demel Teketay (2001) 'Deforestation, wood famine, and environmental degradation in Ethiopia's highland ecosystems: urgent need for action', *Northeast African Studies*, 8(1): 53-76.
- Desta Gebremichael, D., J. Nyssen, J. Poesen, J. Deckers, Mitiku Haile, J. Govers and J. Moeyersons (2006) 'Effectiveness of stone bunds in controlling soil erosion on cropland in the Tigray highlands, Northern Ethiopia', *Soil Use and Management*, 21(3): 287-97.
- FAO (1986) 'Highlands Reclamation Study - Ethiopia', Final Report, vol. I, Rome: Food and Agriculture Organization of the United Nations.
- (2002) 'Conservation agriculture: case studies in Latin America and Africa', FAO Soils Bulletin 78, Rome: Food and Agriculture Organization of the United Nations.
- (2009a) 'Low greenhouse gas agriculture - mitigation and adaptation potential of sustainable farming systems', Rome: Food and Agriculture Organization of the United Nations.
- (2009b) 'Anchoring agriculture within a Copenhagen Agreement - a policy brief for UNFCCC parties', Rome: Food and Agriculture Organization of the United Nations.
- (2009c) 'Enabling agriculture to contribute to climate change mitigation', Submission by the Food and Agriculture Organization of the United Nations, February.
- FDRE (Federal Democratic Republic of Ethiopia) (2010) 'Ethiopia's Climate-Resilient Green Economy Strategy', Addis Ababa.
- Fitsum Hagos, J. Pender and Gebresselassie Nega (1999) 'Land degradation in the highlands of Tigray and strategies for sustainable land management', Issue 25 of a socio-economic and policy working paper, Addis Ababa: International Livestock Research Institute.
- Gould, B. W., W. E. Saupé and R. M. Klemme (1989) 'Conservation tillage: the role of farm and operator characteristics and the perception of soil erosion', *Land Economics*, 65(2): 167-82.
- Greene, W. (2000) *Econometric Analysis*, 4th edn, Englewood Cliffs, NJ: Prentice Hall.
- Hanemann, W. (1984) 'Welfare evaluation in contingent valuation experiments with discrete responses', *American Journal of Agricultural Economics*, 66(3): 332-41.
- Heckman, J. (1979) 'Sample selection bias as a specification error', *Econometrica*, 47: 1.
- Hobbs, P., K. Sayre and R. Gupta (2008) 'The role of conservation agriculture in sustainable agriculture', Royal Society, doi: 10.1098/rstb.2007.2169.
- Howard, P. and E. Smith (2006) 'Leaving two thirds out of development: female

- headed households and common property resources in the highlands of Tigray, Ethiopia', FAO LSP WP 40, Access to Natural Resources Sub-Programme.
- Hussain, M., A. Saboor, A. Ghafoor, R. Javed and S. Zia (2010) 'Factors affecting the adoption of no-tillage crop production system', *Journal of Agriculture*, 26(3).
- Jianakoplos, N. and A. Bernasek (1998) 'Are women more risk averse?', *Economic Inquiry*, 36: 620–30.
- Kumar, A., K. Prasad, R. Kushwaha, M. Rajput and B. Sanchan (2010) 'Determinants influencing the acceptance of resource conservation technology: case of zero-tillage in rice-wheat farming systems in Uttar Pradesh, Bihar and Haryana States', *Indian Journal of Agricultural Economics*, 65(3).
- Kurkalova, L., C. Kling and J. Zhao (2006) 'Green subsidies in agriculture: estimating the adoption costs of conservation tillage from observed behavior', *Canadian Journal of Agricultural Economics*, 54: 247–67.
- Lohr, L. and T. Park (1995) 'Utility-consistent discrete continuous choices in soil conservation', *Land Economics*, 71(4): 474–90.
- Mazvimavi, K. and S. Twomlow (2009) 'Socio-economic and institutional factors influencing adoption of conservation farming by vulnerable households in Zimbabwe', *Agricultural Systems*, 101: 20–29.
- McCarl, B. A. and U. Schneider (2001) 'Harvesting gasses from the greenhouse: economic explorations regarding the role of agriculture and forestry', Unpublished paper, Department of Agricultural Economics, Texas A & M University.
- McCarthy, N., L. Lipper and G. Branca (2011) 'Climate Smart Agriculture: smallholder adoption and implications for climate change adaptation and mitigation', *Mitigation of Climate Change in Agriculture*, Working Paper no 3, Rome: FAO, www.fao.org/docrep/015/i2575e/i2575e00.pdf.
- Mitiku Haile, M. and Kindeya Gebrehiwot (2001) 'Local initiatives for planning sustainable natural resources management in Tigray, Northern Ethiopia', *Ethiopian Journal of Natural Resources*, 3: 303–26.
- Nyssen, J., J. Poesen, J. Moeyersons, J. Deckers, Mitiku Haile and A. Lang (2004) 'Human impact on the environment in the Ethiopian and Eritrean highlands – a state of the art', *Earth Science Reviews*, 64(3/4): 273–320.
- PANE (2009) 'The impact of climate change on Millennium Development Goals (MDGs) and Plan for Accelerated and Sustained Development to End Poverty (PASDEP) implementation in Ethiopia', Addis Ababa.
- Perseverance, J., C. Chimvuramahwe and R. Bororwe (2012) 'Adoption and efficiency of selected conservation farming technologies in Madziva Communal Area, Zimbabwe', *Bulletin of Environment, Pharmacology and Life Sciences*, 1(4): 27–38.
- Schaffnit-Chatterjee, C. (2011) 'Mitigating climate change through agriculture: an untapped potential', Deutsche Bank Research, 19 September.
- Shaikh, S., L. Sun and G. van Kooten (2005) 'Are agricultural values a reliable guide in determining landowners' decisions to create carbon forest sinks?', Unpublished, Working Paper 2005-09, Department of Economics, University of Victoria.
- Smith, P., D. Martino, Z. Cai, D. Gwary, H. Janzen, P. Kumar, B. McCarl, S. Ogle, F. O'Mara, C. Rice, R. Scholes, O. Sirotenko, M. Howden, T. McAllister, G. Pan, V. Romanenko, U. Schneider and S. Towprayoon (2007) 'Policy and technological constraints to implementation of greenhouse gas mitigation options in agriculture', *Agriculture, Ecosystems and Environment*, 118: 6–28.

- Smith, P., D. Martino, Z. Cai, D. Gwary, H. Janzen, P. Kumar, B. McCarl, S. Ogle, F. O'Mara, C. Rice, B. Scholes and O. Sirotenko (2007) 'Agriculture', in B. Metz, O. R. Davidson, P. R. Bosch, R. Dave and L. A. Meyer (eds), *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge: Cambridge University Press.
- Taffere, B. (2003) 'Efforts for sustainable land management in Tigray: the role of extension', in Berhanu Gebremedhin (ed.), *Policies for Sustainable Land Management in the Highlands of Tigray, Northern Ethiopia*, Summary of Papers and Proceedings of a Workshop Held at Axum Hotel, Mekelle, Ethiopia, 28/29 March 2002.
- Wang, J., J. Huang, L. Zhang, S. Rozelle and H. Farnsworth (2010) 'Why is China's Blue Revolution so "Blue"? The determinants of conservation tillage in China', *Journal of Soil and Water Conservation*, 65(2): 113–29.
- World Bank (2007) 'World Development Report 2008: Agriculture for development', Washington, DC: World Bank.

5 | SocioCultural Dimensions of Food: The Case of Teff

Gedf Abawa

Introduction

Questions of rural food production, food security, nutrition and agricultural change are often framed as issues of agronomic practices of agricultural production (Fassil 1988; Thompson and Scoones 2009; Charles et al. 2010). Sociocultural values and local agricultural knowledge systems are marginally considered and integrated in agricultural development programmes. One particular example of this is food culture. Food symbolizes several non-nutritional values and diverse sets of culinary practices and nutritional wisdom that are long-established, deeply embedded, often rigidly defined collective cultural values. Such values of food have strong influences on human thoughts, actions and decisions to modify, accept or reject technological innovations, new species, methods and practices of production and consumption (Fischler 1980; Appadurai 1981; Feenstra 1997; Goodman and Du Puis 2002; Sutton 2004; Coe 2014).

Case studies conducted among subsistence farmers indicate that owing to sociocultural values attached to local crops or food and agricultural practices, people may resist adopting and implementing new methods and practices of farming and food consumption, such as use of genetically modified indigenous crops (Coe 2014). Fischler (1980) commented that serving a culturally accepted dish is an essential and integral part of food production. Thus unless it fits the accepted norm and tradition, people often resist or reject new dishes or species, even during times of serious food scarcity. Many nutritious plant and animal species are excluded from the menu simply for sociocultural reasons. Such factors not only limit the list of locally available potential food items, they also affect the methods, processes and extent of how new agricultural practices and components are introduced, accepted and disseminated. This in turn affects the success and sustainability of agricultural development. Hence, without addressing the sociocultural and symbolic aspects of food and food ways (defined as 'modes of feeling, thinking, and behaving about food that are common to a cultural group'; Smith 2002: 40), it is difficult, though not impossible, to ensure food security and transform subsistence agriculture (Feenstra 1997; Hamilakis 1999). Coe (2014) went as far as arguing for the

necessity and importance of creating a new culture that understands and fits into new agricultural technologies and inputs.

Studying food culture can give a useful insight into and deeper understanding of specific and local contexts of production and consumption, as well as the history and tradition of existing agricultural systems, which are crucial to envisaging patterns of agricultural transformation and to developing feasible agricultural strategies (Thompson and Scoones 2009).

This chapter attempts to discuss the sociocultural and symbolic values of food among the smallholder subsistence farmers of the north-west Ethiopian highlands. To elaborate this, food from the tiny-seeded indigenous cereal *teff* is used as the case study. *Teff* is the most staple, widely preferred and long-established culinary culture in the area, and in most parts of Ethiopia. Food items prepared from *teff* as well as the entire process of *teff* cultivation are heavily loaded with various sociocultural values and symbolic meanings. Examining such values of crops to subsistence farmers may be relevant to understanding the factors influencing adoption of technological innovations, ideas and activities that are important for the transformation of a subsistence economy. It may also give an opportunity to examine the rationale of farmers' habits and their agricultural systems.

Studies on food: a brief review

Some scholars argue that despite such all-encompassing values, the study of food has been limited in academic discourses, particularly in the social sciences (Beardsworth and Keil 1997). Of course, historians and archaeologists have been interested in the study of food since ancient times, but their focus has been restricted to cataloguing and tracing the origins, diffusion and evolution of particular foodstuffs and materials (Goodman and Du Puis 2002; Haaland 2007). Those studies also appeared to be associated with control and access to food resources that may imply an emphasis on the socio-political and economic roles of food. Social, religious, cultural and metaphorical values are largely unexplored (Beardsworth and Keil 1997). Similarly, Mathewson (2000) suggested that interest in studying food among cultural and human geographers is as old as ancient civilizations, but the focus has been on production and accessibility. Absence of interest in other dimensions of food may be attributed to the association of food with the intellectual fields of 'other' professions or disciplines. There is, for example, a trend to attribute the production aspect to agronomists, economists and geographers, while consumption issues are usually left to nutritionists. The prevalent assumption that prioritizes availability and food security also influences studies on the non-economic roles of food. 'In circumstances where the food supply is less secure, food related concerns will usually be a good deal higher on the agenda' (Beardsworth and Keil 1997: 3).

However, it is difficult to conceptualize the issue of food supply and security (an economic and nutritional aspect of food) without having a critical look at how food is embedded in society, both socially and culturally. For example, Hamilakis (1999) argued that food involves the act of incorporation by the body, which also involves our senses, emotions and feelings. For an item to be edible and classified as food, it should be socially defined, and have a certain space and value among people in a particular culture. Moreover, production and consumption of food are inseparable from social, cultural, psychological and even political issues. For example, in the gastro-politics of Hindu South Asia, all the processes and activities from production to preparation and consumption of food are heavily loaded with different values and meanings that strictly govern and structure the socio-economic, cultural and political life of Hindu society (Appadurai 1981).

Furthermore, as inferred in several archaeological, historical and anthropological studies, the aforementioned roles of food are time-transcending. According to Sutton (2004, 2010), cooking tools and sense organs are repositories of traditions that imply the long-lasting effects of food and food habits. Haaland (2007: 78) similarly argued that the complex of food items, preparation techniques and unobservable sociocultural symbolism and embeddedness could persist for millennia. Based on comparative archaeological and ethnographic materials and food ways in Africa and the Near East, she suggested that the material culture and symbolism associated with food ways display qualities that could be described as a *longue durée*. She suggests that 'ethnographically documented webs of relations and symbolism of food in these two broad regions can be traced backwards' to ancient times, even to the beginning of cultivation. Haaland's finding is interesting because it suggests how established food ways could survive for such a long period of time in a particular society.

Hamilakis (1999) suggested that the sociocultural values or meanings of food processing and consumption are being considered crucial issues in contemporary research. Taking food as a major concern can provide rich sources of information for the understanding of society, because it entails significant societal components, particularly about people's cultural traits and social institutions as well as individual and collective attitudes. It may also be valuable to examine production relations and associated politics and power (Garnsey 1999; Goodman and Du Puis 2002; Mintz and Du Bois 2002). Mintz and Du Bois (2002) in particular highlight current debates and discussions about change and transformation to new food ways. Migration and movement of people, and political and economic contexts, are crucial agents of change. However, the combination of variables such as technologies of food production and processing and the physical characteristics of new foods, as well as consumers' response and taste, can significantly determine continuity and change/adoption of new food (ibid.). The above points generally indicate

the diverse and crucial values of food and food ways, and the importance of investigating these elements, which could be relevant to a better understanding of the life of subsistence society.

Nevertheless, as Lyons (2007) indicated, African cuisines have largely been unrecorded and unexplored. Even available studies are biased towards elite cuisine, contributing to the neglect of and lack of interest in complex local food systems. This has undermined appreciation of African food ways. As briefly mentioned in the survey of African food culture as a whole, data about the Ethiopian context, specifically on the sociocultural and historical dimensions of food, are very scarce.

Recent studies on identity and cuisine in Tigray demonstrate the serious lack of written sources and sufficient investigation into the history of local food and its values in the country. Even the available data emphasize religious food prohibition within and between religious groups, mainly in urban areas (ibid.). In her study of rural cuisine and local identity in Tigray, Lyons explored the close relationship between food and identity and the continuity of local cuisine. The comparative ethnographic works among the Amhara, Tigray and Gurage by William Shack are perhaps the only exemplary works that can be cited regarding the crucial role of food culture and tradition in agricultural productivity in the country (Shack 1966). To my knowledge, there is almost no other study focusing on Ethiopia's sociocultural and symbolic aspects of foods, and on the impact of food on socio-economic and cultural transformation.

In this chapter, the significance of sociocultural and symbolic values of the local food system for the continuity and/or transformation of subsistence agriculture is explored. The study is based on ethnographic research conducted on the cultivation and consumption of one of the indigenous crops, *teff*, in Gojjam. My selection of *teff* as a research topic is dictated largely by both its high demand as a staple food crop and its strong social values in the society. The data were collected from different rural villages of the Amhara, Awi and Shinasha people living in seven districts of the former Gojjam province of Ethiopia using observations and interviews. The study is thus purely qualitative in its methodological approach.

In the following section, I will briefly describe the location of the study area and the physical, biological and agronomic aspects of *teff*. With short descriptions of food items prepared from *teff*, I will then present the sociocultural and symbolic values of food items derived from *teff*, and the sociocultural and symbolic practices performed during cultivation of this crop.

The study area

The study was conducted in Gojjam, a province that is almost bound by the Blue Nile gorge and the Lake Tana basin, except on its western border, which adjoins Sudan. Different ethnic groups belonging to speakers of either

Semitic, Cushitic, Omotic or the Nilo-Saharan language families inhabit the province. The Amhara, who speak the Semitic language, are the dominant ethnic group in the study area. The Shinasha forms an enclave of settlement near the southern part of the Blue Nile loop around Metekkel sub-province, while Cushitic-speaking Agew people are settled in the Awi administrative zone (Bahru 1991; Gebru 1991; Tadesse 1988). The various groups of people who have historically occupied the region adhere either to Christianity, Islam or to other traditional religious beliefs. Agriculture is the main source of livelihood for most of these people, except those who have been largely dependent until recently on hunting and fishing (ibid.). The area is known as one of the main grain-producing parts of the country, where *teff* is highly valued and predominantly cultivated (Westphal 1975; Galperits 1981; Gedef 2010).

Brief description of the crop

Teff is one of the major cereals used to prepare *injera* (flat, pancake-like soft bread), which constitutes the staple dish of most Ethiopians (Snailham 1970; Kebebew et al. 1999). It also represents two-thirds of their daily protein intake (Snailham 1970: 95–6). *Teff* is regarded as rich in different elements. It has a high amount of energy and sufficient protein with an exceptionally rich balance of important amino acids such as methionine and cystine. Compared to other cereals, it also has several other important nutrients or minerals, such as iron, calcium, potassium, sodium, zinc, phosphorus and many others. The albumin fractions, glutelin and globulin nutrients present in *teff* make food from this cereal highly digestible (Melak 1966; Kebebew et al. 1999).

Despite its rich nutrient content, the grain size of *teff* is exceptionally small. As Hailu and Seyfu (2000) stated, *teff* is an annual tufted grass having a height of 30–120 cm with an extremely small grain 1–1.5 mm long. The weight of 150 grains of *teff* is equivalent to that of about a grain of wheat; 2,500–3,000 seeds of *teff* weigh one gram (Alemseged 2006: 4). Almeida, in McCann (1995: 55), likewise states that *teff* is ‘a seed so fine that a grain of mustard might be equal to ten of *teff*’. *Teff* has many varieties – the narrow-panicle and the dwarf types locally called *muri* and *dabi* respectively. There are also the white *teff* and the quick-maturing red and brown *teff* varieties (Abebe 1991).

Ecologically, the crop grows across different altitudes and soil types. It is widely cultivated in areas having an elevation ranging from 1,100 up to 2,950 metres above sea level (masl) with soils of varying physical and chemical properties. It grows in waterlogged and well-drained soil, moisture-stressed areas, and even in soils that are not favourable for other crops (ibid.; Doggett 1991; Engles and Hawkes 1991; Seyfu 1991). The crop adapts to wide ranges of climatic conditions, but it grows best in areas having an annual rainfall of 750–850 mm and temperatures from 10 to 27°C (Legesse 2004: 1–2). *Teff* resists moderate drought as well as wet conditions better than most other cereals.

It can also withstand frost. Depending on the specific *teff* type and place of cultivation, its maturation period varies from two to four months (Seyfu 1991).

Although the crop has the above comparative advantages, the smallness of the seed, which makes it hard to deal with, the tedious field preparation involved and the impact of wind or rain on the minute seedling before it germinates and establishes itself are serious limitations associated with *teff* cultivation. Threshing, winnowing and grinding such tiny seeds by hand is very laborious. Handling and transporting this tiny grain is also a problem because it escapes through any crack in a container (ibid.).

However, local farmers cultivate this tiny seeded cereal often as a staple, or as a stand-by. Even in areas where other cereals can provide substantially higher and more reliable yields, farmers still allocate a field for *teff* cultivation (ibid.). In some areas, the fertile and best agricultural highlands are annually tilled for the cultivation of *teff* only (Melak 1966). In the north-western and central Ethiopian highlands, in particular, *teff* surpasses all cereals cultivated in terms of total area and amount of production (Huffnagel 1961; Snailham 1970). The central statistical authority's average data for the seven years 1992/93–1998/99, for instance, indicated that *teff* is annually cultivated on about 1.9 million hectares of land, which constitutes about 30.2 per cent of the total area of cereals cultivated (Hailu and Seyfu 2000; Getachew et al. 2006). In general, *teff* has been the most widely produced crop, but it provides the lowest yield, about 7–9 quintals per hectare. Despite its low yield and high labour demand during cultivation, *teff* has as much food value as the major cereals such as wheat, barley and maize (Kebebew et al. 1999; Hailu and Seyfu 2000; Vandercasteelen et al. 2014).

Teff is used as food only in Ethiopia, and has a long history of cultivation in the country, at least two thousand years (D'Andrea and Wadge 2011). Although we are uncertain when its cultivation began, *teff* is still considered an important crop, which might originally have been domesticated in the highlands of Ethiopia and the Horn (Melaku 1991). Moreover, research on the cultivation of *teff* is regarded as essential to understanding the timing and structure of subsistence changes, because people would probably not have domesticated this laborious small grain cereal if the Near Eastern cereals such as wheat and barley had already been available in the region (Barnett 1999; Lyons and D'Andrea 2003).

The following sections explore the different product items and the various sociocultural and ritual practices that are often associated with the cultivation and use of *teff*.

Food items from *teff*

Teff is used to make different food items such as porridge, gruel and local bread such as *kitta*, *chibito*, *ingoncha*, *anbabero* and *chimbo*, and beer. The fact

that the preferred local foods *injera* and *chimbo* are made of *teff* may indicate the importance of the crop. For example, in many areas, except as a substitute for or addition to making *injera*, barley is not used to prepare other types of local bread. The use of barley as the major component for making *injera* is also confined to high-altitude areas where *teff* production is very limited. In the lowlands, *teff* and finger millet are still the major ingredients for making *injera*. Wheat and barley are rarely used as they are not widely grown. In the highland plateau, which is favourable for the growth of various types of crops, *teff* remains the main ingredient for making *injera*. These observations reflect the impact of ecology on food choices or crop selection for making the staple dish. However, in areas where all major cereals can grow, people prefer *teff* to other crops. In areas where *teff* cultivation is limited, people use *teff* as an addition to make *injera* (see Gedef 2010).

The role of cultural factors in food choice and preference can be seen clearly among the Shinasha people. As the Shinasha elders in Bullen explained, the highlands such as Dangur are favourable for the cultivation of wheat and barley. Nevertheless, such areas are left for their Agew neighbours because the cultivation and consumption of wheat and barley are not part of their culture. Travelling far from their settlement area in the highland plateau, the Shinasha cultivate only *teff*, finger millet, maize and sorghum in the lowland areas. In other areas that are ecologically suitable for barley and wheat, people do not cultivate these crops since they prefer *teff* and other crops.

In Ethiopia, wheat and barley are widely cultivated in areas having an altitude of 1,200–3,300 masl and 1,500–3,750 masl respectively (Abebe 1991). Some of the study sites, such as Ambiki (2,094 masl), Gashena (2,590 masl) and Kencher (2,480 masl), have *Woinadega* and *Dega* agro-climatic zones that are favourable for wheat cultivation. However, cultivation of wheat is unknown in Ambiki. In Kencher and Gashena, people began to cultivate wheat only to a limited extent, particularly in the last few years. In Wad Iyesus (2,015 masl), wheat, barley, finger millet, maize and *teff* are produced in surplus, but the local people make use of *injera* chiefly from *teff*. People who have large or poor families may consume *injera* made from finger millet, or barley, but these are mainly used as an additional ingredient to *teff*. Other crops are used for making local bread, beer or for sale. In Diwaro (2,460 masl), barley mixed with *teff* is used to make *injera* because *teff* is not produced in surplus. Maize and wheat (though they are cultivated) are not used to make *injera* unless there is a shortage of *teff* and barley. In Dagmawi too, where wheat is widely available, people do not make *injera* from wheat unless they have no other options.

The other interesting observation about the *injera* tradition is that, although it may be possible to prepare it separately from such grains as barley, sorghum and finger millet, *teff* powder is usually added to ease baking as well as to increase the quality of the *injera*. Thus, even in areas where *teff* is not cultivated

owing to ecological factors (cold environment), people often buy or acquire *teff* through barter, and mix it with barley, finger millet and sorghum (their staple crops) to make the staple dish, *injera*. Across most of the study sites, women prepare *injera* mainly from *teff*, particularly during holidays or when receiving guests. Besides, until very recently, wheat and maize were hardly used for baking *injera*. The local people suggested that *injera* from these crops was regarded as unhealthy and a possible cause of abdominal pain, whereas food from barley, *teff* and sorghum, and to some extent finger millet, is considered the healthiest.

The use of *teff* at least as an addition to other crops for making the staple food, *injera*, even among people who do not cultivate *teff*, shows its value as a crucial component in the local cuisine. *Teff*'s good flavour and ease of digestion, and its technical advantages in the preparation of the preferred meal, make it the most preferred crop. *Teff* is easier to process into food within a short time. Unlike that from other crops, *injera* from *teff* can be processed even within a day (see Gedef 2010).

Teff symbolizes socio-economic status as well. Across places investigated in this study, there is a common tradition of categorizing locals in social hierarchies based on the dominant crops used for daily consumption. For example, the predominantly barley-producing and -consuming areas are considered inferior to those where people often use *teff* as their main diet. The same is true of finger millet. Thus, in areas where finger millet is widely cultivated and used as a staple, the local people are often associated with low socio-economic status compared to those who predominantly cultivate and utilize *teff*. In general, in the study area, *teff* is associated with strong social values. Not only does the consumption of *teff* signal prestige and status, its cultivation and volume of production confer strong social prestige among the communities. This, along with the serving of food from *teff* for guests and at social events or feasts, symbolizes the special association of *teff* with social values. According to local informants, a farmer may fail to produce a sufficient amount of *teff* owing to environmental factors and/or a shortage of agricultural inputs. Yet, even in such circumstance, he would buy or acquire *teff* in exchange for other products so that the family can prepare *injera*, especially organizing social events. Failure to provide the socially accepted dish from *teff* would lead to strong social rebuff or insult. Comparative studies show that 'in almost every feast, there is some degree of social competition. That is, those who do not keep up in their fulfillment of expected hospitality fall behind' (Dietler 2011: 180). Such practices always affect the relative status and influence of participants and their quality of relationships. The feast also serves a wide variety of important structural roles in the broader political economy. Feasts can create and maintain social relations that bind people together in various intersecting groups and networks (ibid.).

Owing to ecological constraints, land degradation, population growth and subsequent decline of *teff* yield, other cereals are increasingly used for making *injera*. Legesse (2004) argues that compared to other crops it is difficult to secure an increased yield of *teff*, particularly when land is continuously cultivated for long periods. As farmers explained, the reduction in *teff* yield due to increased land fragmentation and degradation has forced them to use other cereals as additional ingredients for making *injera*. People in the urban areas have, for example, begun to use rice together with *teff* to make *injera*. During the 1984/85 famine, rural people in the highlands of Gojjam province attempted to bake *injera* from potato. In some cool highland parts, *engdo* (grain presumably introduced during the Italian occupation) is also used as an additive to *teff* powder in the preparation of *injera*. Therefore, in times of scarcity or decline in the yield of the most common cereals, people tend to use and integrate other crops. However, the local people often integrate local crops into the existing culinary tradition rather than adopting new dietary habits. This tradition might have been practised even before the rise of the Axumite civilization (Lyons and D'Andrea 2003). The underlying reason for integration rather than adoption is the deep-rooted food culture based on *teff*.

Sociocultural and symbolic uses of *teff*

In addition to its use in making different foodstuffs, *teff*, along with some other crops such as finger millet, barley and *noog* (Niger seed), is used for various sociocultural and symbolic purposes. Serving unfermented thin, flat bread prepared from *teff* and *noog* is part of the celebration of a successful transition from winter to summer. Societally, change of seasons is symbolically associated with the idea of transition from dark to bright and vice versa. July marks the beginning of the severe cold summer in the Ethiopian highlands. Eating such food is thus a ritual act believed to have protected people from the severe cold and effects of the rainy summer season. According to informants, particularly in the mountain highlands, *teff* porridge is often consumed in the summer in the belief that it will help people withstand the severe cold temperatures.

Unfermented and unleavened thick bread from *teff* is also served to people during a feast in mid-September. *Teff* powder collected from each household in the village will be baked into bread on an open fire, and is served to individuals in the field. This bread is regarded as a traditional medicine for abdominal pain. In some places, slightly fermented beer from red *teff* or finger millet is served on the first day of September, the day that marks the beginning of a new year in the Ethiopia calendar. However, a drop of beer is first poured onto the central pillar of the house. Although these three days of the year clearly coincide with holidays of the Ethiopian Orthodox Church, informants argue that the tradition of celebrating these days could also be associated

with the surviving traces of pre-Christian beliefs. Historical accounts show continuity and syncretism of old or pre-Christian practices and traditions with orthodox Christianity in different areas long after the introduction and spread of Christianity to the region (Tadesse1972, 1988).

Furthermore, *teff* is used for healing certain diseases or is symbolically linked with the ability to protect against dangerous spirits. It is, for example, used to cure rabies. Eating red *teff* porridge after taking the traditional medicine for tapeworm is believed to have a strong healing value. In addition, at times of epidemics, a variety of unleavened local bread and porridge made from red *teff* and pounded *noog* is kept at road junctions. In some situations, roasted barley is served as well. Porridge from red *teff* may be cooked on the main road if an epidemic affecting cattle occurs in the locality. These practices are believed to protect people and cattle against the epidemic. In some areas, particularly among the Shinasha, porridge from red *teff* and sorghum is kept at the junction with the main road whenever such events happen. After two weeks, people again prepare for another ceremony, and *chimbo* (local bread) and *bordie* (local beer) from red *teff* and sorghum are offered as a sacrifice. The sacrifice is made precisely at the initial ceremonial site. After three elders have offered a benediction, a piece of *chimbo* is thrown and a drop of *bordie* is sprayed onto the ground as an offering to the spirit and then everybody tastes the food. This is done to keep the spirit of the ancestor happy so that it can protect them against epidemics. Unfermented thin, flat bread from red *teff* is prepared whenever a person feels sick. This type of bread is served on the first day of each month, in conjunction with a lavish coffee ceremony, as a celebration of the successful transition to the next. In most parts of the rural highlands of north-west Ethiopia, coffee is not a regular drink. However, people customarily drank it during feasts or ceremonies such as on New Year, on the first day of the month, at Easter, and at other monthly feasts and ceremonies. A woman also sprinkles drops of coffee on the floor before she serves it to people. Such uses are more of a ritual than mere consumption.

Teff is also strongly associated with fertility. In the study area, it is common to serve a woman with various types of food soon after delivery of a baby. In practical terms this is done to compensate for her body loss. However, serving her with certain types of food also has symbolic and ritual meanings. On such occasions, porridge from red *teff* is regularly offered. In some areas, men are not allowed to eat porridge prepared specially for this purpose. Moreover, if the labour at delivery becomes serious and extended, fermented *teff* batter will be painted on her face from forehead to nose. This is thought to ease delivery and protect the woman from evil spirits (*seraki*). Unleavened thick bread from *teff* baked on an open fire is also served in the meantime. In addition, when lightning occurs, red *teff* is collected from the community in the village and made into porridge in the specific area where the lightning struck. The strike is

assumed to have occurred because their god is not satisfied. During this ritual ceremony, a blessing is first offered by the elders and a piece of porridge is thrown onto the ground. Then everybody in the village must eat or taste the porridge. A local beer made from red *teff* is also served at this ceremony. In the Shinasha culture, local bread and drink made from red *teff* and sorghum, in addition to pounded *noog*, are served. It is believed that lightning will not strike there again. Among these people, when a burial takes place, *chimbo* (local bread) prepared from *teff*, finger millet or sorghum is prepared and thrown around the main junction of a road near the burial place. The food vessel is also broken there afterwards. It is believed that this prevents the recurrence of death and disease in the family or village. As priests explained, in the past there was a tradition to bury *teff* grains with the dead.

Teff also symbolizes animal fertility. Hence, in some areas a newborn calf is served with porridge made from *teff* powder using milk from the cow. First, the calf tastes the porridge and then part of its body (from the mouth to its tail) is painted with the porridge. Then the porridge is served to the family and neighbours attending the ceremony. These areas are principally barley-producing regions, but farmers keep and use *teff* for this ritual purpose. Porridge from *teff* is served to bridal couples during marriage and to the people attending the marriage feast. Serving the porridge to all participants also signifies the wealth and status of the host. Elders explained that such close social associations and rituals based on certain crops such as *teff* are a tradition that has been handed down for generations. Such uses of *teff* are common even in areas where *teff* is not cultivated. *Teff* is not only a crop used in various cultural, social and ritual contexts, but its cultivation is also loaded with different cultural and symbolic associations (see also Gedef 2010).

Sociocultural and ritual practices in *teff* cultivation

As this section will elaborate, all the processes of *teff* cultivation (sowing, harvesting, threshing and collecting) are performed along with well-entrenched sociocultural and symbolic practices. These practices are reflected in the provision of food and drink, erection of certain objects and verbal expression or recitation, including blessings by elders. For example, after the *teff* field has been trampled by cattle and sown with seed, thick rolled bread from *teff* is cooked on an open hearth and served to those involved in the activity. Yet it is the field that must be served with the food first. A blessing by elders must also be offered before the food is delivered. It is believed that the dough cooked in the open hearth imbues the *teff* field and promotes its productivity. In some areas, the people who have participated in the trampling of the field must be served with porridge in the house of the owner, usually in the evening. In other areas, trampling of the *teff* field is deliberately undertaken on the seventh or ninth day of final ploughing. This is a belief system or

ritual practice associated with successful growth and increased yield. If the *teff* grows in good condition, at each New Year (on 1 September), chicken and less-fermented beer will be served in the field. In some areas, during the *Meskel* ceremony (17 September in the Ethiopian calendar), a bundle of wood (*demera*) is erected in each crop field, where thin flat bread is sliced and hung upon it. Moreover, a cup of beer is poured over it. Meanwhile, people pray for mercy, and for the crops prevail over stones and weeds. This latter activity is more common these days in Awi and Shinisha.

In some areas, in contrast to other crops, *teff* harvesting begins after a very small amount of *teff* is separately harvested from the centre of the field. This is then threshed at home, ground into flour, baked into bread, and served among all members of the family. According to informants, these practices are undertaken so that the new yield can be tasted before an evil spirit tastes it. They also symbolize the inauguration of the New Year's yield. Rituals that are more elaborate are often performed during threshing. Before the threshing of *teff* begins, a mixture of powder from medical plants – *Lepidium sativum* (*jetto*) and *Ruta chalepensis* (*tena adam*) – is prepared. This is diluted with water and is sprayed over the threshing floor and the *teff* that is going to be threshed. It is also kept on the threshing floor until the yield is collected. It is believed that otherwise the bad spirit (*wosaji*) will blow the grain away. Whenever a wind blows up, the farmer sprays the mixture over the threshing yard. It is more frequently sprayed during winnowing. Slaughtering a cock in the *teff* threshing yard is also performed immediately before starting to thresh the *teff*.

Teff threshing is also accompanied by the provision of different foodstuffs and beer called *agumas*. Any person passing near the threshing floor is served with the food. People believe that otherwise the yield would either vanish or diminish. In some sites, a person passing near the threshing yard is also expected to offer labour services. The local people believed that such labour provision would increase the *teff* yield because it has a mythological relation to their gods. The food types served in the threshing area may of course differ from place to place. A variety of local bread specifically prepared from *teff* with pounded *noog* powder, local beer and porridge from *teff* and sorghum, coffee (which would scent the spirit) and goat or chicken are offered during *teff* and finger millet threshing. In some sites, three *Chibito* (rolled bread), three *yesat ingocha* (thick bread cooked on an open hearth), *abizi* (thin bread) with pounded *noog* and coffee are served after the *teff* is winnowed. This is regarded as a ritualized activity associated only with *teff* threshing. All these local breads should be made from *teff* flour only. Around Lake Tana, about three or four fish are brought alive to the *teff* threshing yard. Soon after winnowing the grain, all the fish are cooked and eaten there in the yard. The threshing yard must be served first. Unless pieces of these types of food are

first thrown on the threshing floor, no one else can taste them. In addition, a fresh calabash container filled with water, and pieces of fine-grained stones such as chalcedony, are kept in the threshing yard until the grains are collected.

As part of ritual activities related to *teff* cultivation, the cleaned piles of the threshed *teff* grain are also covered with a white sheet of cloth on which *injera* and beer are kept. The owner pours some beer onto the threshing floor and tastes the *injera* and a cup of beer before they collect the grain. Placing iron objects and erecting a winnowing brush of *teff* at the centre of the cleaned heaps of *teff* grains are other ritual practices implemented during *teff* threshing. This, according to belief, protects the grain against evil spirits. In some *teff*-producing areas, women measure the cleaned *teff* on the threshing floor during collection while in some other areas women are not even allowed to enter the threshing yard before the yield is measured. Moreover, in some sites, menstruating women and recently delivered women are totally forbidden to enter the threshing yard because it is thought that the yield would decline. There are also areas where talking to each other while the *teff* yield is being measured is considered taboo. In some places, after the yield is cleaned, the owner is required to sleep over it. In the meantime, one of his sisters takes some of the *teff* grain, which will be processed into local drink, and the whole family is invited to taste. All these elaborate practices are performed for *teff*, and to a lesser extent for finger millet. There are no such cultural and ritual practices performed while cultivating other crops, even though these crops are widely grown (see also Gedef 2010).

In summary, the provision of specific types of foods and drinks to *teff* fields and threshing yards has spiritual significance. For example, farmers believed that the food served on the farm would smell of the soil and would allow the seeds to grow well. Provision of food and drinks during threshing is related to the belief that it will boost the amount of yield. People believe that unless food is served there, threshing yards will be hungry and will not give good yield. Ideas related to impurities and taboos during the collection of grains symbolize fertility and productivity. Comparative ethnographic studies suggest that farmers often link bad yield to the failure to scarify the land. Ritual foods for cultivation also indicate symbolic links between cultivation and food preparation because they both involve various states of transformation (Berg 1975; Moran 2007).

Discussion

The ethnographic material presented in this chapter may further contribute to our understanding of the need to address food culture and subsistence transformation more thoroughly and closely. The data offers a clear picture of the place and value of *teff* among various local cultures in the study area. It demonstrates how *teff* is viewed as the preferred staple food crop and portrays

its strong association with different sociocultural practices and symbolic values of the people. Moreover, it shows that cultivation of this tiny-grained cereal is labour-demanding. It involves elaborate sociocultural and symbolic practices, but compared to other cereals, its productivity is low.

Teff cultivation faces many challenges. Farmers indicated a remarkable decline in the productivity of *teff*. Unlike with other crops, attempts to increase its productivity using agricultural inputs or extension packages did not bring a significant increase (Seyfu 1991). Kebebew et al. (2011) argued that low productivity is one of the serious limitations of *teff*. Comparative data on yield and productivity of major crops cultivated in the country between 2004/05 and 2010/11 and 2012/13 show that *teff* has the lowest yield per hectare (Demeke and Di Marcantonio 2013; Vandercasteelen et al. 2014). And more than any other major crops, *teff* requires intensive labour during its cultivation. The technical limitations and problems inherent in improving and producing better-yielding seed varieties for *teff* are still a challenge (Demeke and Di Marcantonio 2013).

Despite such problems, farmers continue to allocate a fraction of their plot of land to *teff*. In situations where productivity of a high-labour-demanding crop is low, one would expect the expansion and intensification of other technologically suitable and high-yielding crops such as wheat, barley and maize. Yet the emerging data shows that there has even been a remarkable expansion of land allotted for *teff* cultivation in recent times (see also *ibid.*). Explaining the underlying reasons why people are so specifically attached to this labour-demanding but less productive crop despite the suitability of the region for cultivating other productive crops is relevant to understanding the essential characteristics of the region's subsistence. It may also have implications for policy directions.

Available studies attribute the issue to the economic advantage, i.e. rising demand for and market prices of *teff*. Owing to its increasing price, there has been a decline in *teff* consumption among the rural community and the urban poor. Thus *teff* is emerging as a luxury food and a cash crop supplied to the growing urban middle class (*ibid.*). Vandercasteelen et al. (2016) argue that urbanization and access to markets, information exchange and agricultural inputs has brought about an intensification of *teff* production, and they recommend focusing on improving and developing rural-urban network facilities that would maximize demand for and access to such a high-quality staple food. However, the study is centred on the economic aspects of production. Factors related to the socialcultural values, digestibility, taste and psychological values of food from *teff* are not considered. As is indicated in the data, in addition to economic incentives, the palatability and nutritional values, wide range of ecological adaptations and drought-resistant qualities of *teff* may account for why people prefer to cultivate this low-yielding crop. The long-established and well-entrenched local food ways based on this crop could be another factor.

The ethnographic data presented above shows that, despite its low productivity and high labour demand, farmers insist on cultivating *teff*. It also indicates the high preference for *teff* consumption. Farmers who do not cultivate *teff* are accustomed to securing it through exchange or purchase. At the very least they use it as an addition to the dominant crops often grown in their localities. Moreover, at times of scarcity or environmental calamities, people integrate new crops into their existing culinary tradition (*injera* culture). In the nearby urban centres, people may, for example, combine rice with *teff* to make *injera*. During the 1984/85 famine, potato was used as an ingredient (mixed with cereals) to prepare *injera*. As stated, recent studies show a decline in *teff* consumption among the urban poor and even in rural society, but added to other cereals *teff* is an important ingredient in cooking the staple food *injera* (see also Demeke and Di Marcantonio 2013). These trends imply the possibility of a change in subsistence, but at the same indicate the strong impact of existing food ways on the socio-economic transformation of rural society. Instead of changes to their culinary tradition, people prefer to maintain their existing food habits, i.e. the *injera* culture. The absence of cultivation of wheat and barley in areas where there is no ecological and environmental barrier to these crops (among the Shinasha people) further indicates the role of the sociocultural dimensions of food in human subsistence choices. These and other situations documented above contrast with the economic, technological and ecological models of agricultural transformation. The well-embedded sociocultural food values and traditions may thus be other relevant factor influencing farmers' choices and decision-making in terms of crops cultivated. Norman et al. (1995) state that food preference, more than climate and soil type, governs the wide array of cereals cultivated. Garnsey (1999: 139–40) also pointed out that the human physiological need for survival may 'explain the question why people need food, but not why they choose to eat a particular food or a combination of food'. Why people eat what they eat may be explained by taste, texture/odour or cultural or social factors. Nutritious crops may be rejected owing simply to the negative values attached to them.

Conclusion

Teff is an indigenous cereal that occupies an important place among subsistence farmers in north-west Ethiopia. It is the most widely cultivated and preferred staple food crop. It is also heavily loaded with different sociocultural and ritual practices. Cultivation and consumption of *teff* can be seen as sociocultural and economic activities with deeply embedded symbolic values and meanings.

Available research findings on *teff* give sufficient descriptions about the nutritional values, agronomic practices and ecology, productivity/yield, extension and expansion of the production of the crop and the need to commercialize

it through agricultural intensification extensions and programmes. But the sociocultural aspects of food from this tiny-grained, labour-demanding, low-yielding crop, and its possible impacts on the transformation of subsistence agriculture, are almost unexplored. The chapter examines such dimensions of the crop and asks why there exists a remarkable interdependence between this crop and the sociocultural and symbolic traditions of the people. It also enquires what these traditions and embedded value systems imply for the continuity of local subsistence practices in the region. In addition, it explores the potential relevance of studying long-established food ways or culinary traditions to addressing changes and transformations in the characteristics of subsistence agriculture.

The chapter argues that the strong resonance of sociocultural, symbolic and ritual practices associated with *teff* could be due to its exceptionally rich qualities, such as good flavour, nutritive values and digestibility, and ease of processing into food within a short period of time, as well as its drought-resistant qualities and ecological flexibility and adaptability. Once the crop was deeply integrated into societies' values, perceptions, attitudes and sociocultural practices, people may well have found it difficult to abandon or make significant changes to their existing culinary traditions or subsistence practices. The impact of these long-established traditions and experiences on people's choices regarding what to cultivate might not be simple. As is observed in this ethnographic data, farmers persist in allocating their fragmented plot of land to *teff* despite its low yield and high labour input. This could be due to its economic value, especially its rising market price in recent times (Vandercasteelen et al. 2016). Yet the embedded sociocultural values and preferences for food items from *teff*, as is indicated in above, strongly influence farmers' choices and decisions. The data thus suggests a need to look at the sociocultural roles of the crop in addition to its economic and agronomic advantages. Since *teff* covers the largest share of the limited and highly fragmented plots of farmlands in the region, closer examination of farmers' attachment to and perception of it, their attitudes and food values, should be considered when determining policy directions in agricultural intensification. This is important because food choices may not necessarily reflect people's nutritional and biological needs. Societal practices and norms may influence human dietary habits. The processes and effort involved in the production, distribution and preparation of food can also influence the very survival and continuity of traditions (see Beardsworth and Keil 1997; Garnsey 1999).

This study in general recommends that research approaches and policy directions should also address the prevailing sociocultural values and belief systems of local people. This would provide essential clues to understanding the opportunities and inherent challenges prevalent in the society. In addition to environmental, technological, institutional, socio-political structures and

other factors that are functional in character, future research on subsistence agriculture should consider the crucial dimension of food and society in locally existing and historical contexts. The study also indicates that fundamental changes in the inherent value system, attitude, ideology and perception of the society are important in bringing about significant transformation in subsistence agriculture. Research activities and policy directions on agricultural transformation should be participatory, people- and value-centred, so that local knowledge, culture, attitudes and practices, as well as the specific ecological and socio-economic contexts of the target population, can be addressed. These would help bring meaningful transformation in rural subsistence.

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References

- Abebe, D. (1991) 'A decade of germ plasm exploration and collecting activities by plant genetic resource center', in J. Engels, J. Hawkes and M. Worede (eds), *Plant Genetic Resources of Ethiopia*, Cambridge: Cambridge University Press, pp. 202–17.
- Alemseged Beldados (2006) 'The Agordat material, Eritrea and its implication for early food production and regional contact', Unpublished MA thesis, University of Bergen.
- Appadurai, A. (1981) 'Gastro-politics in Hindu South Asia', *American Ethnologist*, 8(3): 494–511.
- Bahru Zewde (1991) *History of Modern Ethiopia 1855–1974*, Addis Ababa: Addis Ababa University Press.
- Barnett, T. (1999) *The Emergence of Food Production in Ethiopia*, BAR International Series no.763, Oxford: British Archaeological Reports.
- Beardsworth, A. and T. Keil (1997) *Sociology on the Menu: An invitation to the study of food and society*, London: Routledge.
- Berg, R. (1975) 'Land: an extension of the peasant's ego', *Anthropological Quarterly*, 48(1): 4–13.
- Charles, H., J. Godfray, R. Beddington, R. I. Crute, L. Haddad, D. Lawrence, F. Muir, J. Pretty, S. Robison, M. Thomas and C. Toulmin (2010) 'Food security: the challenge of feeding 9 billion people', *Science*, 327(5967): 812–18.
- Coe, A. (2014) 'Considering religious and cultural aspects of food and agriculture when seeking to introduce or develop GMOs', *AgBioForum*, 17(2): 197–204.
- D'Andrea, A. C. and P. Wadge (2011) 'Tef (*Eragrostis tef*): a legacy of pastoralism?', in G. Fahmy, S. Kahlheber and A. C. D'Andrea (eds), *Windows on the African Past: Current approaches to African archaeobotany*, Reports in African Archaeology 3, Frankfurt: Africa Amanga Verlag, pp. 209–41.
- Demeke, M. and F. Di Marcantonio (2013) 'Analysis of incentives and disincentives for *teff* in Ethiopia', Technical Notes Series, MAFAP, Rome: FAO.
- Dietler, M. (2011) 'Feasting and fasting', in T. Insoll (ed.), *Oxford Handbook of the Archaeology of Ritual and Religion*, Oxford: Oxford University Press, pp.179–94.

- Doggett, H. (1991) 'Sorghum history in relation to Ethiopia', in J. Engels, J. Hawkes and W. Melaku (eds), *Plant Genetic Resources of Ethiopia*, Cambridge: Cambridge University Press, pp. 141–59.
- Engles, J. and J. Hawkes (1991) 'The Ethiopian gene centre and its genetic diversity', in J. Engels, J. Hawkes and W. Melaku (eds), *Plant Genetic Resources of Ethiopia*, Cambridge: Cambridge University Press, pp. 23–41.
- Fassil, G. (1988) 'Food and development in Ethiopia: retrospect and prospect', *Journal of Ethiopian Studies*, 21: 83–110.
- Feenstra, W. (1997) 'Local food systems and sustainable communities', *American Journal of Alternative Agriculture*, 12(01): 28–36.
- Fischler, C. (1980) 'Food habits, social change and the nature and culture dilemma', *Anthropology of Food*, 19(6): 937–53.
- Galperits, G. (1981) *Ethiopia: Population, resources and economy*, Moscow: Progress Publishers.
- Garnsey, P. (1999) *Food and Society in Classical Antiquity*, Cambridge: Cambridge University Press.
- Gebru, T. (1991) *Ethiopia: Power and protest: Peasant revolts in the twentieth century*, Cambridge: Cambridge University Press.
- Gedef Abawa (2010) 'Cultivation and consumption of *teff* in Gojjam Highlands: implications for understanding the beginning of food production in Ethiopia', *Nyame Akuma*, 10: 77–87.
- Getachew Agegnehu, Amare Gizaw and Woldeyesus Sinebu (2006) 'Crop productivity and land-use efficiency of a *teff* faba bean mixed cropping system in a tropical highland environment', *Experimental Agriculture*, 42(4): 495–504.
- Goodman, D. and M. Du Puis (2002) 'Knowing food and growing food: beyond the production–consumption debate in sociology of agriculture', *Sociologia Ruralis*, 42(1): 5–22.
- Haaland, R. (2007) 'Porridge and pot, bread and oven: food ways and symbolism in Africa and the Near East from the Neolithic to the present', *Cambridge Archaeological Journal*, 17: 67–83.
- Hailu, T. and K. Seyfu (2000) 'Production and importance of *teff* in Ethiopian agriculture', in T. Hailu, B. Getachew and M. Sorrells (eds), *Narrowing the Rift – Teff Research and Development*, Addis Ababa: Ethiopian Agricultural Research Organization, pp. 3–7.
- Hamilakis, Y. (1999) 'Food technologies/ technologies of the body: the social context of wine and oil production and consumption in Bronze Age Crete', *World Archaeology*, 31(1): 38–54.
- Huffnagel, H. (1961) *Agriculture in Ethiopia*, Rome: FAO.
- Kebebew, A., K. Seyfu, T. Hailu, T. H. Nguyen, B. Abraham, A. Mulu, G. Bai, S. Belay and K. Tiruneh (1999) 'Diversity among germplasm lines of the Ethiopian cereals', *Euphytica*, 106: 87–97.
- Kebebew, A., A. Sherf, B. Getachew, M. Gizaw, T. Hailu and M. Sorrells (2011) 'Quncho: the first popular *teff* variety in Ethiopia', *International Journal of Agricultural Sustainability*, 9(1): 25–34.
- Legesse, A. (2004) 'Response of [*Teff* (*Eragrostis tef* Zucc.) Trotter] to applied nitrogen and phosphorus in Sirinka, North Eastern Ethiopia', Unpublished MSc thesis, Haramaya University.
- Lyons, D. (2007) 'Integrating African cuisines: rural cuisine and identity in Tigray, Highland Ethiopia', *Journal of Social Archaeology*, 7(3): 346–71.
- Lyons, D. and A. C. D'Andrea (2003) 'Griddles, ovens, and agricultural origins: an ethno-archaeological study of bread baking in highland Ethiopia', *American Anthropologist*, 105(3): 515–27.
- Mathewson, K. (2000) 'Cultural landscapes and ecology III: foraging/ farming, food, festivities', *Progress in Human Geography*, 24(3): 457–74.

- McCann, J. (1995) *People and the Plow: An agricultural history of Ethiopia 1800-1900*, Madison: University of Wisconsin Press.
- Melak, H. (1966) 'Chemical composition of *teff* (*eragrostis tef*) compared with that of wheat, barley and grain sorghum', *Economic Botany*, 20(3): 268-73.
- Melaku, W. (1991) 'An Ethiopian perspective on conservation and utilization of plant genetic resources', in J. Engels, J. Hawkes and W. Melaku (eds), *Plant Genetic Resources of Ethiopia*, Cambridge: Cambridge University Press, pp.1-19.
- Mintz, W. and C. Du Bois (2002) 'Anthropology of food and eating', *Annual Review of Anthropology*, 31: 99-119.
- Moran, E. (2007) 'The sacred as everyday: food and ritual in Aztec art', PhD dissertation, City University of New York.
- Norman, M., J. Pearson and P. Searle (1995) *Tropical Food Crops in Their Environment*, 2nd edn, Cambridge: Cambridge University Press.
- Seyfu, K. (1991) 'Germplasm evolution and breeding work on *teff* (*eragrostis tef*) in Ethiopia', in J. Engels, J. Hawkes and W. Melaku (eds), *Plant Genetic Resources of Ethiopia*, Cambridge: Cambridge University Press, pp. 323-8.
- Shack. A. (1966) *The Gurage: A people of the Ensete culture*, Oxford: Oxford University Press.
- Smith, T. (2002) 'Pharaohs, feasts, and foreigners: cooking, food ways, and agency on ancient Egypt's southern frontier', in T. Bray (ed.), *The Archaeology of and Politics of Food and Fasting in Early States and Empires*, New York: Kluwer Academic, pp. 39-64.
- Snailham, R. (1970) *The Blue Nile Revealed: The story of the Great Abbai expedition, 1968*, London: Chatto and Windus.
- Sutton, E. (2004) 'Ritual, continuity and change: Greek reflections', *History and Anthropology*, 15(2): 91-105.
- (2010) 'Food and the senses', *Annual Review of Anthropology*, 39: 209-23.
- Tadesse Tamrat (1972) *Church and State in Ethiopia 1270-1527*, Oxford: Clarendon Press.
- (1988) 'Process of ethnic interaction and integration in Ethiopian history: the case of the Agew', *Journal of African History*, 29(1): 5-18.
- Thompson, J. and I. Scoones (2009) 'Addressing the dynamics of agri-food systems: an emerging agenda for social science research', *Environmental Science and Policy*, 12(4): 386-97.
- Vandecasteele, J., Mekdim Dereje, B. Minten and Alemayehu Seyoum (2014) 'Perceptions, impacts and rewards of row planting of *teff*', LICOS Discussion Paper Series 350/2014, Leuven: Centre for Institutions and Economic Performance.
- Vandecasteele, J., Seneshaw Tamru, B. Minten and J. Swinnen (2016) 'Cities and agricultural transformation in Africa: evidence from Ethiopia', Paper presented at the 5th International Conference of the African Association of Agricultural Economists, 23-26 September, Addis Ababa, ageconsearch.umn.edu/bitstream/246963/2/.
- Westphal, E. (1975) *Agricultural Systems in Ethiopia*, Wageningen: Centre for Agricultural Publishing and Documentation.

6 | The Impact of Malaria Epidemics on Agricultural Production in Dembia and Fogera, 1950–2000

Fantahun Ayele

Introduction

Rural health plays a crucial role in smallholder agriculture. Characteristically, smallholder agriculture is dependent on human labour. Agricultural activities follow a routine calendar with very little room for flexibility. Any temporary or long-term health problems in rural areas results immediate negative impacts on agriculture. Thus, success in agricultural transformation in Ethiopia cannot be imagined without a healthier rural labour force. This chapter provides a historical account of the impact of malaria epidemics on the rural population and their agriculture. It highlights that poor institutional and organizational capacities constitute part of the vulnerability, lack of preparedness and uncoordinated response to epidemics that resulted in devastating impacts in rural areas.

Malaria has been one of the leading killer diseases in Ethiopia. Of the total population, 68 per cent are living in areas identified as malarious. Of these, about 40 per cent and 24 per cent are living in malaria epidemic and endemic areas respectively. Every year, malaria cases in Ethiopia are estimated at 4–5 million, but these figures can grow to about ten million cases during times of epidemic. Malaria mortality is worrisome in that it ‘accounts for 13 to 26 percent of all inpatient admissions, and accounts for 13 to 35 percent of mortality in health facilities’ (Biscoe et al. 2004:15). According to studies conducted in many parts of Ethiopia, the most common malaria infections are *Plasmodium falciparum* (60–70 per cent) and *Plasmodium vivax* (30–40 per cent) (Carter Center 2012: 20).

Malaria outbreaks usually coincide with two seasons when crucial agricultural activities are carried out: April–June and September–December. In the highland areas, ploughing and planting take place between April and June while peasants harvest their crops between September and December. Malaria thus has an immense impact on agricultural production (Adugna n.d.: 7).

Areas between 1,500 and 2,500 metres above sea level are believed to be prone to malaria epidemic (USAID 2009: 11). Of these areas, the Dembia

and Fogera plains located respectively east and north of Lake Tana have been devastated by occasional malaria epidemics in the past.

Lake Tana, the largest lake in Ethiopia, receives a considerable volume of water from several rivers. Among these rivers, Gumara and Reb, both originating in the Guna mountains, flow to Lake Tana from the east. During the rainy season, these rivers usually burst their banks and flood hundreds of hectares of the Fogera plain every year. In addition, as the volume of water from the rivers and innumerable streams flowing to Lake Tana tremendously increases during the rainy season, the low-lying areas along the shores of the lake stay under water for several weeks every year. This is particularly common in the Dembia and Fogera plains, and makes these low-lying areas a suitable habitat for mosquito breeding.

When Lake Tana retreats during the dry season, peasants of the Fogera plains have developed a tradition of planting maize along the wetlands known locally as *Baher Sheshu* (meaning literally the sea retreats). The alluvial soil along the shores of the lake is very suitable for maize cultivation and it does not require much labour. This practice, however, encourages the breeding of mosquitoes and increases the incidence of malaria in the Fogera plains.¹ A recent experiment conducted in Ethiopia shows that maize pollen facilitates the growth of mosquito larva to the pupal stage (McCann et al. 2005: 176).

Rural health and farm labour

Throughout the centuries, farming communities in north-west Ethiopia have been suffering from periodic epidemics that had a strong impact on agricultural production. Ethiopian chronicles as well as European missionary and traveller accounts tell us about the outbreak of epidemics at different times in north-west Ethiopia. One such epidemic broke out during the time of King Serse Dendel (1563–1597), who built his castle at Guzara east of Lake Tana just outside a small town called Enfraz. According to his chronicle, as a result of the epidemic many people died around the king's court. Likewise, the reign of Susenyos (1607–1632) also witnessed the outbreak of major epidemics. One of these occurred in 1611 and claimed the lives of many people. The other major epidemic broke out in 1618/19 and it is reported to have killed a considerable number of people and officials, including Kentiba Ze Giorgis, the governor of Dembia. According to a Jesuit missionary account, it was the same epidemic which forced Susenyos to move his seat to Denqez (Pankhurst 1986: 34–5). The reign of Fasiledes (1632–1667) also witnessed a terrible epidemic that broke out in 1634. It swept through Dembia and reached the king's court at Denqez. Other epidemics were also observed in the eighteenth century. The nature of the epidemic that occurred in 1708 was not identified. But the one that broke out in 1718 was reported to be smallpox and it claimed the lives of many children. Then two epidemics known locally as *metat* and *gunfan*

broke out in 1740 and 1747 respectively. Again in 1768, a smallpox epidemic greatly affected Gondar and its environs (*ibid.*: 45, 52).

Between 1888 and 1892, a widespread disaster of catastrophic proportions struck the country. It was attended by cattle disease, locust invasion, epidemics and famine. The famine was preceded by a cattle disease known as rinderpest, which wiped out about 90 per cent of the country's cattle. As a result, farming came to a standstill (*ibid.*: 62). Before that disaster, the people of Fogera had been entirely dependent on pastoral life. But the loss of their cattle during the rinderpest epidemic forced them to start the practice of farming. The cattle plague was followed by a cruel famine. According to Menelek's chronicler, G. Sellase W. Aregay, 'in Bagemder so many people had died that there were almost no labourers to till the land' (*ibid.*: 89).

Such epidemics that broke out at different times through the ages obviously inflicted incalculable damage on rural life. In recent times, several scholars have conducted studies on the relationship between rural health and agricultural production. John Ulimwengu, for instance, studied farmers' health and agricultural productivity in rural Ethiopia in 2009. He found that agricultural 'production inefficiency increases significantly with the number of days lost to sickness'. He also underlined that diseases like malaria reduce agricultural productivity through the loss of labour (Ulimwengu 2009: 83_4).

Kwadwo Asenso-Okyere and Daniel Ayalew have conducted a similar study on the interaction between health and farm labour productivity in Africa. They proved that illness in rural areas greatly undermines the production capacity of farmers. They concluded that:

... beyond the direct impacts due to the loss of labour, illness undermines long-term agricultural productivity in a number of ways: when illness leads to long-term incapacitation, households may respond through withdrawal of savings, the sale of important assets ... withdrawing children from school, or reducing the nutritional value of their food consumption. All of these responses can have adverse effects on the long-term labour productivity of household members. (Assenso-Okyere and Ayalew 2011)

The study conducted in south central Ethiopia by Wakgari, Damen and Ahmed also confirms that malaria still imposes an 'economic burden on rural households' by keeping farmers at home. The study also underlines that since the peak transmission of malaria usually coincides with the planting, weeding and harvesting seasons, the disease tremendously undermines the productive capacity of farmers (Wakgari 2005: 1148).

Likewise, Kiszewski and Awash came to a similar conclusion after studying the clinical and epidemiological burdens of epidemic malaria on rural communities. They found that 'malaria causes substantial losses to households in the form of forgone income, treatment costs, missed schooling and decreased

agricultural production.' They also emphasized: 'malaria strikes during planting and harvesting seasons shrinking productive capacity when agricultural workers are in highest demand' (Kiszewski and Awash 2004: 131).

Malaria epidemics in Dembia and Fogera districts, 1950–58

The first systematic study on malaria in Ethiopia was conducted by the Italians during the occupation period (Ashenafi 2008: 31).

In the post-liberation period, with the help of international organizations, the Ethiopian government tried to gather information on malaria infections through blood samples and carried out malaria control activities. Even then, seasonal epidemics continued to ravage malaria-prone areas such as the Dembia and Fogera plains. Of these outbreaks, the 1953 malaria epidemic was one of the most devastating disasters, which wiped out thousands of people in both Dembia and Fogera.²

The malaria epidemics that broke out in both the Dembai and Fogera districts, especially in the 1950s, were the subject of much correspondence between local, regional and higher officials. During the course of this study, the researcher has managed to discover among the Gondar archives a total of 161 letters exchanged between lower and higher officials. These archival documents are now housed in four rooms in the North Gondar Zone administration building, one of several buildings constructed by the Italians during the occupation period (1936–41). Using these untapped archival materials, the researcher has tried to reconstruct the malaria epidemics that broke out in the Dembia and Fogera plains from 1950.

According to the Gondar archival sources, some areas east and south-east of Lake Tana were affected by malaria in the autumn of 1950. On 14 December 1950, for instance, the governor of Debre Tabor *awrajja* reported to the governor general of Begemder and Semen that he had been informed about the outbreak of a deadly malaria epidemic in the low-lying areas of Dera and along the shores of Lake Tana. According to the report he received from Tach Dera sub-district, two to three people were dying per day from each household. He requested an immediate dispatch of antimalarial drugs to the affected areas. In those days, Dera and Fogera were governed as a single district.³ For his part, the governor general notified the regional public health office of the situation, first by telephone and then in writing.⁴

Three months later, the governor of Debre Tabor *awrajja* sent another report to the governor general. 'Despite the severity of the epidemic,' the governor complained, 'no health worker had been sent to Dera-Fogera district to treat the affected population.' Although the mortality from malaria was still very alarming, no action was taken to combat the epidemic between December 1950 and March 1951. On 21 March 1951, the governor of Debre Tabor once again reported the alarming increase in the death rate from the malaria epidemic

because of inactivity. No antimalarial drugs had been dispatched to the affected areas so far. Nor did any health worker arrive to treat the sick.⁵

Later in May 1951, we find reports about the distribution of antialarial drugs in some areas highly affected by malaria. Even monks and hermits living in the island monasteries of Lake Tana were not immune from malaria infection. On 12 May 1951, therefore, the Gondar hospital sent 2,000 antimalarial drugs through the Naviga Tana Share Company to be distributed among monastic communities in the island monasteries of Lake Tana, along with directions as to dosage.⁶

The 1951 outbreak of malaria was not limited to Fogera district and the island monasteries. In late May 1951, local officials in Dembia reported the outbreak of malaria in the district to the Gondar *awrajja* administration. For his part, the *awrajja* governor reported the case to the governor general on 8 June 1951.⁷ It was decided to send a health professional to Dembia so as to gather first-hand information about the status of the disease. Accordingly, on 23 June 1951, Dr G. H. Frick, a medical officer from Gondar hospital, visited Qolla Debba, capital of Dembia district. He witnessed the outbreak of malaria in the area but not in the form of an epidemic. He suggested that a health officer should make an inspection trip once a week into the countryside to control the spread of the disease.⁸

Because of the critical shortage of medical personnel, it was impossible to contain the spread of malaria. As a result, people who contracted malaria in Fogera district had to travel to Debre Tabor to get medical attention at the Seventh Day Adventist Hospital. In February 1952, the Gondar hospital reported to the office of the governor general that it was not in a position to send additional health workers to Debre Tabor *awrajja* to treat people infected with malaria. Earlier, a health worker had already been sent to the area.⁹ *Bitwoded* Andargachew Mesay, the governor general of Begemder and Semen, sent a telegraphic message to Colonel Tamrat Zegeye, informing him that he had already sent drugs by air sufficient for 5,000 people affected by malaria.¹⁰

Then, in June 1951, the Fogera district governor reported the outbreak of malaria in the Fogera plains, Wudo and Amora Gedel. He requested that the governor general authorize the dispatch of a health worker. In response to the request, a health worker named Ketema Alemu was assigned to treat people in Fogera and Amora Gedel.¹¹

For its part, the Ministry of Public Health expressed its concern that in addition to the shortage of medical staff available to be dispatched to areas hard hit by malaria epidemic, transportation problems had been hampering efforts to combat the epidemic.¹² The Ministry of Public Health and the governorate general were receiving reports about malaria infections not only from local governors but also from army units based at different places. On 31 May 1952, for instance, the Eighth Infantry Brigade based at Azezo reported to

the governor general the outbreak of an unknown epidemic in the town of Qolla Debba and the Guramba Mikael area. A day later, a police officer from Dembia district reported the outbreak of an epidemic in Guramba and Zengaj sub-districts and the town of Qolla Debba. Then the Gondar *awrajja* police reported the problem to the regional police, which in turn communicated the message to the governorate general.¹³

In June 1952, all the sub-districts of Dembia were affected by malaria. The health worker at Qolla Debba was unable to go out of the town to treat patients in the countryside as the number of people seeking medical attention in the town was growing alarmingly. In addition, he ran out of antimalarial drugs. The Dembia district thus requested that the regional public health office send two health workers to the area along with medicine.¹⁴ In the severely affected areas, such as Guramba Mikael, Gana Got, Geracha (in Guramba sub-district), Achera Maryam (in Zengaj sub-district) and Fenja (in Jenda sub-district), farming came to a standstill and people could not plant crops. The health worker at Qolla Debba was overwhelmed by patients and he was unable to contain the epidemic. According to a report from Dembia district, forty-nine people had already died in the sub-districts of Guramba, Zengaj and Jenda.¹⁵

Because of the gravity of the situation, the Ministry of Public Health ordered the regional health office to send a health professional to Qolla Debba in order to identify the epidemic. Then the person sent to the area reported that the epidemic that was ravaging Dembia was actually malaria. Nevertheless, the hospital at Gondar could not send additional health workers because of the critical shortage of health professionals.¹⁶

In July 1952, the deputy commander of the regional police received an alarming report about the intensity of the epidemic in Dembia from a local police officer. He requested that the governor general send an experienced health professional with sufficient antimalarial drugs to the area.¹⁷

As the epidemic reached alarming proportions, the hospital at Gondar assigned a health worker to work at Qolla Debba clinic. Earlier, another professional had been assigned as a peripatetic health worker to treat patients in the most affected villages.¹⁸

Another locality highly affected by malaria was the port of Gorgora on the northern shore of Lake Tana. On 8 November 1952, Lieutenant Colonel Shiferaw Tesemma, commander of the Eighth Infantry Brigade, reported that two to three people were dying of malaria every day in and around Gorgora.¹⁹ A month later, local officials in Dembia district reported that 717 people had already died in the sub-districts of Guramba, Zengaj and Gorgora as a result of the malaria epidemic. The report showed that the epidemic had reached catastrophic proportions by the autumn of 1952.²⁰

Between January and April 1953, however, the epidemic seemed to have subsided and no deaths from malaria were reported. But in May 1953, another

letter from the deputy commander of the regional police reported the outbreak of a severe malaria epidemic in Dera district. It recommended the deployment of a health worker with adequate medicine to the area without delay.²¹ In the same month, another letter from the regional police deputy commander reported that all members of the police in Qolla Debba had fallen sick and there was nobody to maintain the security of the town.²²

Apart from the Gondar archival documents, the only written source about the 1953 malaria epidemic in the district of Dembia is a mimeographed report by M. A. Chabaud held at the Pasteur Institute in Addis Ababa. According to that unpublished field report, 7,000 people perished in Dembia alone as a result of the epidemic (Fontaine et al. 1961: 795).

As mortality from the malaria epidemic reached alarming proportions, the governorate general introduced a penalty for local officials who failed to report death rates in their locality. According to the regulation, a local official who did not report the number of people who lost their lives because of the epidemic would be fined 10 birr.²³

The malaria epidemic that ravaged Dembia was so severe that all government offices as well as the market at Qolla Debba were closed. The three health workers in the town were struggling to treat the sick day and night. Another health professional was ordered to close his clinic in Gondar and treat patients at Qolla Debba. The local officials insisted that the market at Qolla Debba should be reopened so that people could buy food for their survival.²⁴

In addition to the policemen who fell sick, the governor of Dembia, Captain Abraha Meshesha, his secretary *Balambaras* Ejegu Gessese, the local court secretary, *Balambaras* Mehrete Desta, the local magistrate, Abate Gobena, and other local officials had already contracted malaria. The remaining local officials feared that since the policemen were sick, the criminals who were kept at Qolla Debba prison might escape. They therefore, suggested that the prisoners should be transferred to Gondar to avoid a prison break by criminals.²⁵

In the meantime, an urgent letter from Dembia district reported that in the town of Qolla Debba alone 150 people had already died because of the malaria epidemic. The main problem for the district administration had been the absence of healthy people to bury the dead. The district administration thus requested that the office of governor general do something to bury the dead speedily.²⁶

The three health workers who had been treating the sick at Qolla Debba fell ill and eventually died of malaria. A health professional named Debesay Adhanom was sent to Qolla Debba with antimalarial drugs to treat the people there. As the situation became more serious, the Gondar hospital sent three more health workers to Qolla Debba.²⁷

Horrified by the growing mortality figures, Colonel Tamrat Zegeye, governor of Gondar *awrajja*, paid a visit to Qolla Debba, the epicentre of the epidemic,

in late June 1953. Then he sent a telegraphic message to *Dejach* Asrate Kassa, governor general of Begemder and Semen, outlining what he had witnessed at Qolla Debba. According to the message, there were 700 patients in the town and about ten people were dying each day. Colonel Tamrat thus suggested to the governor general that physicians and antimalarial drugs should be sent immediately to Dembia.²⁸

The malaria epidemic similarly gripped Dera district, as reported by the local police. In response to that report, a health worker was sent to Dera district.²⁹

In Dembia, the situation was getting worse. The epidemic was so dreadful that there were no individuals to bury the dead in the town of Qolla Debba.³⁰ When the epidemic broke out in April 1953, many inhabitants left their homes. The local officials had no information about the people who had fled the locality. They were not in a position to look after abandoned property left behind by many families. They thus reported to the higher officials that they would not be held responsible if something went wrong with the properties.³¹ Qolla Debba became a ghost town deserted by its residents. All government offices and the market were still closed. On 12 September 1953, those business persons who had fled Qolla Debba in fear of the malaria epidemic were advised to return and reclaim their property.³²

The epidemic continued to claim more lives each day. On 30 August 1953, the Dembia district administration reported that 2,135 people had already perished in the town of Qolla Debba and Zengaj sub-district alone as a result of the malaria epidemic. The district administration, therefore, appealed for a hospital to be built in the district. What was even more worrying was the fact that the local people were unable to carry out agricultural activities because of the epidemic.³³

The epidemic was equally severe in the sub-districts of Zengaj and Guramba. In the Zengaj sub-district alone, eight localities, namely Abba Libanos, Abbo, Achera Maryam, Debba Giorgis, Medhane Alem, Fentro Maryam, Deras Mikael and Woina Kidane Mehret, were highly affected by the epidemic. In the sub-district of Guramba, the hardest-hit areas were Guramba Mikael, Guramba Giorgis, Guramba Bata and Debelo Maryam. In all these areas, most of the inhabitants fell sick and there were no cattle herders. The cattle were left in the fields for several months and there were no herders to bring them home. As a result, the cattle devastated all the crop fields. Survivors were too weak to harvest their crops. The sick people from the surrounding sub-districts were flocking to Qolla Debba to seek medical treatment. But the few health workers at Qolla Debba could not treat the incoming patients. The district administration thus requested that the higher officials send additional health professionals to these affected areas.³⁴ The other severely affected locality was Arabia Medhanealem. The health worker assigned there could not cope with the situation and abandoned his post. The governor general thus ordered the

regional health office to send a new health professional to the area as urgently as possible. Like other localities, Arabia Medhanealem experienced terrible loss of human lives. Most of the survivors did not recover quickly and there were no healthy people to bury the dead. The governor of Zengaj sub-district, *Qegnasmach* Bayu Melke, and his family fell sick and there were no people to take care of the family. All crop fields had been devastated by cattle.³⁵

The church administrator of Achera Maryam, Wonde Getahun, gives a graphic description of the malaria epidemic that ravaged his locality. Part of his letter reads:

An epidemic has broken out in Dembai district in the countryside named Achera Maryam. A plague of catastrophic proportion has befallen the country and the community. Since the people are sick, there was no one to take the dead to church graveyards. Sick people are collapsing in the field. There was no one to look after cattle. I am weeping while applying to you that the church has been closed and Dembia has become a waste land.³⁶

For its part, the regional diocese requested the public health office do everything possible to contain the epidemic.³⁷ Likewise, the secretary of the Zengaj sub-district, Wolde Yesus Worqneh, who lost his wife and brothers, expressed his grief in a heartbreaking poem. Part of it reads:

My wife passed away abandoning children to my care
 So did my brothers who perished this year
 I would rather prefer to die
 It is pointless to live without relatives in any way.
 I am heartbroken for my children
 For they lost their mother who went to heaven
 Dembia, a great country is laid waste
 It used to welcome a hungry guest.³⁸

In late October 1953, a resident from Achera Maryam named Mengistu Tesemma requested that Dembia district send a physician to his locality. He had this to say in his letter:

In some parishes, ten people are dying every day. Since there are no people to bury the dead, corpses are left unburied for 3–5 days. The remaining people are on their beds still sick from malaria. There are no cattle herders and domestic animals are left loose destroying crop fields. Since there are no people to take the dead to churches, some women bury them in shallow graves not far from their houses. It is with the sense of grief I apply to you to request higher officials so that a physician could come to treat the sick.³⁹

The malaria epidemic in Achera Maryam and Areroch was so severe that corpses were left unburied. As a result, dogs and wild animals reportedly

devoured dead bodies. This was particularly the case when domestic servants died. They were left in the open field to be eaten by vultures, dogs and hyenas.⁴⁰

A health worker named Debesay Adhanom, who had been assigned to Qolla Debba, was treating people in his rented house. He visited one of the hardest-hit areas, Arabia Medhanealem, and treated about five hundred people. He was given 100 injections and some antimalarial drugs. In late October 1953, he reported that he had no more antimalarial drugs to treat the sick.⁴¹

The malaria epidemic also spread to Azezo sub-district and the inhabitants were seeking medical attention.⁴² For its part, Debre Tabor *awrajja* administration reported that the malaria and typhus epidemics had already broken out in the sub-districts of Farta, Ebennat, Hamus Wonz and Fogera. It requested that the governor general send health workers and medicine to affected areas.⁴³

The spread of the epidemic was so alarming that a telegraphic message was sent to the Ministry of Interior asking for the airlifting of antimalarial drugs.⁴⁴

In other localities, such as Tach Teda Maryam, Lay Teda Egziabher Ab, Fenter Ledeta and Damot Giorgis, the epidemic was equally severe. Since all members of the clergy were sick, churches in those localities were forced to bring in priests and deacons from other areas for funeral services.⁴⁵

In response to the alarming mortality, the Gondar hospital sent two additional health workers to Dembia in November 1953. In the meantime, it assured the regional education office that the epidemic that had broken out in many areas was malaria but not other contagious diseases. It therefore advised the local officials that students could also be treated in clinics like other people. The hospital also made it clear that it would not send health workers for students only.⁴⁶

Assefa Belay, a health professional from the Pasteur Institute who was head of epidemic diseases, made an inspection tour in the most affected areas of Dembia between 17 and 25 November 1953. At the end of his trip he reported that there were 1,059 malaria cases in Qolla Debba, 300 in Guramba, 600 in Arabia Medhanealem and 346 in the Zengaj area. He thus suggested that no fewer than twenty-five health workers should be sent to Dembia. But his proposal went unheeded owing to the critical shortage of malaria control professionals.⁴⁷

The situation in the neighbouring *awrajjas* of Libo and Debre Tabor was equally serious. In an urgent letter to the governor general, the secretary of Debre Tabor *awrajja* reported the intensity of the malaria epidemic in the sub-districts of Ebennat, Qolla Ebennat, Dera, Gubda, Amora Gedel and Gerariya. He also reported that there were no people to harvest crops and look after cattle. He appealed for the dispatch of health workers and antimalarial drugs immediately. In another letter written on 14 December 1953, Mersha Retta, the *awrajja* secretary, reported that the Seventh Day Adventist Hospital at Debre Tabor was overwhelmed by patients who had contracted malaria.

Many of the sick people were dying on their way to the hospital. Furthermore, the absence of people to harvest crops and to look after cattle had brought about food shortages.⁴⁸

Overwhelmed by terrifying reports of mortality figures from several areas, health professionals working at Gondar hospital felt that they had a moral obligation to do something. Accordingly, on 29 December 1953, Dr Graf Bassewitz, the medical director of Gondar hospital, visited the most-affected areas: Achera and Arabia. He reported that between early September and late November, 1,700 people (900 in Arabia and 800 in Achera) had already died of malaria. At the time of his visit, about 700 people were under treatment. In December, another 200 people died of malaria. At the height of the epidemic, over ten people were dying every day. People reported that the epidemic broke out first in Guramba and then spread to Achera and Arabia. The medical director also reported that crops had not been harvested and he saw well-nourished cattle left loose in crop fields. At the time of his visit, the vast plain between Achera and Lake Tana was still swampy. In all the villages, he saw unharvested corn and some of the houses were unoccupied. He was told that, in one of the villages, twenty-four people had died and the rest had left the area. He heard similar stories in other areas. In Arabia, he visited twenty-seven families and found fifty-two sick persons, out of whom only eight had other diseases. The rest had contracted malaria. He reported, 'All had fever and enormous swelling of the spleen and nearly all of them had serious anaemia.' He also visited a cemetery where about a thousand people were buried. The medical director finally concluded that there was

a real malaria epidemic over a wide area with a high mortality, now going down but not at all passed. ... Hundreds of people are still sick and new cases are reported every day. The high mortality and the wide spreading of the epidemic had caused serious impoverishment of the population. The cause of the epidemic depends on [the] climatic and geographical situation of this district: swamp and low situation.⁴⁹

He recommended that the two health officers from the Pasteur Institute should stay for two more months and the villagers in the low-lying areas should be relocated.⁵⁰

On 28 January 1954, the governor of Gondar *awrajja* reported to the governor general that although the malaria epidemic, which he called *nedad* (a local name for malaria), was ravaging Achera and Arabia, the health officers sent from Addis Ababa had returned without completing their job. The governor general had no power to order the Pasteur Institute to send health workers to Dembia. The only thing he could do was to instruct the regional health office to send Dr H. Jacoby from Gondar hospital to the most-affected areas with sufficient antimalarial drugs as urgently as possible.⁵¹ Dr Jacoby visited Qolla

Debba in late December 1953. After his visit, he proposed that the population of the town should be relocated. Part of his proposal reads:

Coladuba [Qolla Debba] is a malaria-infested place. Malaria appears there in an epidemic form for about three months of the year and for the rest continues endemically and it decimates the population ... Provision of sanitation and anti-malarial drugs has in the past been most expensive without solving in any way this major problem. With a view to finding a satisfactory solution, it is on medical ground proposed to transfer the population of the central part of Coladuba to another place. Chronic malaria can as a rule not be eradicated from its victims in a short time. Its parasites remain silent within the organs of the affected persons and can be transmitted by malaria mosquitoes to other people. The proposal of such a population transfer, therefore, is based on the condition that a place can be found, which is entirely free of malaria mosquitoes. The selection of such a place should be left to the discretion of the Pasteur Institute.⁵²

However, Dr Jacoby's recommendation was ignored, owing probably to lack of resources for population relocation. Reports of mortality figures continued to reach Gondar. A letter written to the office of the governor general from Dembia district on 11 March 1954 notified the deaths of 4,789 people between June and December 1953. Most of them died in the months of September and October. The most-affected localities were Woina Kidane Mehret, Fentro Maryam, Arabia Golmase, Woqerako, Dalko, Leba Maryam, Gerarge, Zengaj Maryam, Abbano, Achera Maryam, Abba Libanos and Arabia Medhanealem.⁵³

Meanwhile a medical team from Addis Ababa and Gondar visited Dembia in early 1954. The governor of the Gondar *awrajja* accompanied the medical team. The governor expressed his distress about the malaria epidemic he witnessed during his visit in a letter he sent to *Dejach* Asrate Kassa, governor general of Begemder and Semen. He then suggested the exemption of the people from land tax for a year.⁵⁴ In another letter he wrote to the governor general two months later, he requested that he exempt the people of the hardest-hit areas, particularly Guramba and Zengaj, from land tax. He estimated the death toll to be well over six thousand. Part of the letter reads:

The number of people wiped out by malaria is more than 6,000. For the people of this district, it has been impossible to bury the dead let alone harvest crops. As I repeatedly reported in my earlier letters, corpses were left unburied and devoured by vultures and dogs. When asked to pay taxes, the survivors complained that they had not cultivated their land to grow crops and wild animals had eaten their cattle. They further grumbled that their life was getting worse. I therefore kindly request your Excellency to exempt these people from land tax.⁵⁵

For his part, the governor general, *Dejach* Asrate Kassa, requested *Ras* Abebe Aregay, the Minister of the Interior, to exempt the people living in the sub-districts of Guramba and Zengaj from land tax for a year. Part of the appeal he sent on 18 June 1954 reads:

The severe malaria epidemic that is ravaging Dembia district since June 1953 has already devastated Zengaj and Guramba sub-districts. The epidemic has claimed the lives of thousands of people. A considerable number of people are still suffering from sickness. As a result, the local people were unable to cultivate the land and harvest their crops. That has created a serious problem in the collection of land tax. The epidemic that struck these localities is beyond imagination. Elders here have never experienced such a devastating epidemic in their lifetime. Although the epidemic has now subsided, there are still new malaria cases. If the survivors are forced to pay land tax, they would be bitterly disappointed and many people may leave their villages to evade taxation.

I, therefore, kindly request your Excellency to consider all these and exempt the people from a one-year land tax.⁵⁶

On 30 August 1954, *Ras* Abebe Aregay responded to *Dejach* Asrate Kassa, telling him to get the signature of the regional *bejrond* (treasurer) to endorse the application that the people of Dembia should be exempted from land tax for a year owing to the malaria epidemic.⁵⁷

Inability to collect land tax was not the only problem the government faced. People in malaria-stricken areas were reluctant to take medication as prescribed by physicians. With regard to such problems, the Minister of Public Health, Tsehayu Enqo Sellase, reported to the Minister of the Interior that the majority of the population did not want to take antimalarial drugs out of ignorance.⁵⁸

Two years after the 1953 malaria epidemic, malaria broke out in the low-lying areas east of Lake Tana. In December 1955, the Dera-Fogera district reported to Debre Tabor *awrajja* the spread of malaria in all the five sub-districts of Dera-Fogera.⁵⁹

In Dembia, there are no reports of major outbreaks in that year. But the inhabitants were told to contribute money for the construction of a health centre. On 3 January 1955, in an urgent letter to *Blatta* Shibeshi Zegeye, the governor of Dembia district was instructed to make sure that every person who contributed 1.50 birr for the construction of a health centre at Qolla Debba should get a receipt. It had already been decided that every person should contribute this amount and that local dignitaries should collect contributions. It was reported earlier that contributors had not been given receipts for the money they paid. On 4 February 1955, the governor general informed the Ministry of Public Health that out of the total 5,485 birr contributed for the

construction of a health centre, Dr Curtis had already collected 3,190 birr. The rest was in the hands of district officials.⁶⁰

On 5 February 1955, the Minister of the Interior strongly warned *Dejach* Asrate Kassa that public contributions for the construction of the health centre should not be collected without giving receipts to contributors and copies of the receipts should reach the *awrajja* administration to avoid corruption and embezzlement.⁶¹

In April 1955, the Gondar hospital reported that it had received a total of 71,145.50 birr from the public and it had already started the construction of the health centre at Qolla Debba. Construction was completed and the health centre was inaugurated by the emperor on 14 December 1956.⁶²

Months before the inauguration, *Dejach* Asrate Kassa, the governor general, L. A. Orihuela, WHO sanitary engineer Dr Haldor Larsen, deputy director and WHO senior adviser Dr A. Curtis and the director of the Gondar Public Health College and Training Centre held a meeting. Among other things, they discussed the operation of the Dembia district health centre at Qolla Debba. It was decided that treatment of epidemics would be free of charge but patients presenting with other diseases should pay for their drugs and dressings but not for the services. The Ministry of Public Health would pay the health personnel. In addition, it was decided that Arab shops should in the future be allowed to sell only those drugs not requiring a physician's prescription.⁶³

The health centre erected at Qolla Debba contributed a lot in minimizing mortality from malaria. However, recovery from the 1953 epidemic was very slow. Since the epidemic had coincided with the planting and harvesting seasons, it had negatively affected the livelihoods of peasants in malaria-infested areas. Although peasants were exempted from land tax during the 1953 epidemic, they were required to pay double in 1955 to compensate for unpaid taxes in the previous year. That created a serious grievance among the peasants in malaria-affected areas. Peasants felt betrayed, and they regarded the government as a greedy regime that showed no sympathy for the suffering of its people.⁶⁴

The Gondar *awrajja* administration reported that there was considerable delay in tax collection because survivors of the epidemic were forced to pay double the normal land tax to compensate for the unpaid taxes expected from the deceased. The *awrajja* administration appealed for peasants not to be forced to pay a land tax twice as high as the normal amount.⁶⁵ When a request for tax exemption was made for the hardest-hit sub-districts of Zengaj and Guramba, the Dembia district governor, *Blatta* Shibeshi Zegeye, and *Dejach* Kassa Meshesha, governor of Gondar *awrajja*, were ordered to send a list of people unable to pay land tax until 15 June 1955. The governor general was concerned that one of the lists did not reach his office until April 1957. The authorities at Gondar thus ordered the local officials to send a list within ten days.⁶⁶

While the government was preoccupied with unpaid taxes, a number of malaria cases were reported in Dera and Fogera areas. In November 1955, the Debre Tabor *awrajja* administration reported that there was an outbreak of malaria in the lowlands and typhus in the highlands. A few weeks later, another report about an alarming increase in malaria cases reached the *awrajja* administration from Dera-Fogera district. There was a request for the dispatch of drugs and health workers without delay.⁶⁷

Ato Ketema Alemu, head of the Debre Tabor clinic, was instructed to treat the estimated more than forty patients who fell sick in Dera district.⁶⁸

In addition to the incidence of malaria, the government was also trying to control the spread of smallpox. However, people were reluctant to be vaccinated against smallpox. The new governor general, *Dejach* Kefle Dadi, ordered *Dejach* Kassa Meshesha to forcefully vaccinate the people of Qolla Debba since there were very few people volunteering to be vaccinated.⁶⁹

While the people of Dembia and Fogera were recovering from the 1953 disaster, another malaria epidemic of catastrophic proportions broke out in 1958 in several regions of Ethiopia. Particularly, it heavily affected Shewa, Gojjam, Wollo, Begemeder and Simen. The epidemic was first detected in June by a malaria survey team from areas south of Lake Tana such as Bahir Dar, Genji, Andassa and Sebatamit. Within a few months, the whole Lake Tana region was gripped by a devastating epidemic (Fontaine et al. 1961: 795–7). It was mainly caused by ‘unusually high rainfall over an extended period as well as elevated temperatures and relative humidity’ (Lindsay and Martens 1998: 35). The southern shores of Lake Tana were one of the hardest-hit areas (Kissi 2000: 120).

The only area in the Lake Tana region that evaded the 1958 epidemic was Dembia district, which was selected by the International Cooperation Administration (ICA) as a malaria control project area. Following the catastrophic 1953 epidemic, the ICT team began to spray ‘DDT at the rate of 2g of DDT per m² of wall space’ in all the households in the Dembia plain, covering 2,500 square kilometres. As a result, ‘only 80 cases were reported from the project [area] with an estimated population of 60,000 and there were no deaths attributed to malaria’ (Fontaine et al. 1961: 797).

However, villages outside the project area sustained heavy losses. Field reports put mortality figures as follows:

Mekonnen, reporting on his investigations of nine villages near Lake Tana, indicated that out of an aggregate population of nearly 4,000, malaria was contracted by 3,000 people and 496 died during the first four months of an estimated 6 month epidemic period. Wasti, reporting on nine districts near Lake Tana, with an estimated aggregate population of 170,000, gave the number of malaria cases as 83,000 and the deaths in excess of 5,000.

Ryder, reporting on investigations made in 326 villages, with an estimated aggregate population of 131,000, gave the number of malaria cases as 75,100 in a 3-month period and the number of deaths attributed to malaria as 4,736. (Ibid.: 800)

During the peak of the 1958 epidemic, people who contracted malaria in Fogera district were flocking to the Seventh Day Adventist Hospital at Debre Tabor. The hospital there reported that it had identified and treated 2,780 malaria cases (ibid.: 801).

Fontaine et al. (ibid.) put the blame on the unusually high rainfall, relative humidity and high temperature, which created a perfect environment for the spread of the main malaria vector, called *A. gambiae*. Such conducive weather and the absence of immunity from malaria 'set the stage for the Ethiopian epidemic of 1958' (ibid.: 802-3).

The epidemic lasted for over six months (June-December) and affected areas with an elevation between 1,600 and 2,150 metres. During those six months, about three million people are believed to have contracted malaria. Among those malaria cases, about 150,000 people are estimated to have perished (ibid.: 803; Kiszewski and Awash 2004: 129).

Malaria epidemics since 1959

The year 1959 saw a major breakthrough in the fight against malaria. With the help of the United States Agency for International Development (USAID), the Ethiopian government set up the Malaria Eradication Service (MES). The MES began to train its staff in malaria control operations at its training centre in Nazareth. The MES then embarked on a series of malaria control operations in malaria-prone areas (Wakgari et al. 2005: 79). In the 1960s and 1970s, American jeeps and the malaria control workers dressed in overalls carrying spraying equipment were seen every six months in many malaria-prone areas.⁷⁰ In 1971, the MES was renamed the Malaria Control Programme (MCP). The government seems to have realized that it was not possible to eradicate malaria (Wakgari et al. 2005: 79).

In 1964, another malaria epidemic broke out around Gondar and it is reported to have claimed the lives of 5,000-7,000 people (Ashenafi 2008: 34). But we could not find archival sources dealing with the 1964 epidemic.

Following the establishment of the MES in 1959, DDT spraying was used as a principal means of combating malaria epidemics. In order to deal with epidemics effectively, indoor residual spraying of DDT was employed much more extensively in the 1970s and 1980s (Wakgari et al. 2005: 8, 11).

More recently, it was reported that mosquitoes had developed resistance to DDT. As a result, new malaria epidemics began to break out in many parts of the country. In 1995, for instance, a malaria epidemic of high intensity broke

out on the southern shores of Lake Tana. In Bahir Dar city alone, among 11,588 patients with high fever, 5,944 were found to be malaria cases (Ashenafi 2008: 34–5). The author himself was infected with malaria in 1995 and he vividly remembers the unusually high number of malaria cases in Bahir Dar.

It was only in 1996 that the North Gondar zone reported the outbreak of a malaria epidemic in Dembia. The district administration was instructed to carry out spraying and distribution of antimalarial drugs. Although peasants were recruited and trained in malaria control, there was no report from the trainees. It was suggested that these trainees should work as full-time malaria control workers.⁷¹

In 1997, Dembia district faced budgetary constraints in carrying out spraying in the months of May and June. As a result, it was instructed to involve the public in malaria control activities.

In 1998, in some parts of Ethiopia, such as west Gojjam, a devastating malaria epidemic broke out. In Bure district alone, there were 42,000 malaria cases; 740 of those affected died. According to Reuters and the *Chicago Tribune*, the epidemic claimed the lives of more than four thousand people in Gojjam.⁷²

As malaria became more insidious once again owing to the resistance of mosquitoes to DDT, local officials began to involve the community in malaria control operations. Between 24 and 30 August 1999, Dembia district, for example, mobilized 8,945 (5,255 males and 3,690 females) community members for malaria control activities. During the operation, the inhabitants drained ponds, filled up ditches and cut down grasses.⁷³

Despite such community activities, there were occasional outbreaks of malaria. In 2003, the Amhara region was affected by another malaria epidemic of high intensity. As in those of 1958 and 1998, the mortality rate was very high (Ashenafi 2008: 35).

Conclusion

In 1953, Dembia and Fogera experienced the worst malaria epidemic in living memory. Although local officials repeatedly appealed for help, the government could not combat the epidemic effectively because of the shortage of health professionals and antimalarial drugs. As a result, thousands of people lost their lives in both Dembia and Fogera. The epidemic was so dreadful that corpses were either buried in shallow graves or left in the field to be devoured by dogs and wild animals. Since the epidemic broke out during the planting and harvesting seasons, agricultural activities came to a standstill. There were no people to look after cattle. They were left in the field for months. Furthermore, the suspension of farming activities brought about food shortages.

The 1958 malaria epidemic was equally devastating, particularly in Fogera. Dembia evaded the 1958 epidemic because it had already been included in the Malaria Control Programme. Since the use of DDT had already been

initiated in Dembia, there were few cases of malaria. The establishment of the Malaria Eradication Service (MES) in 1959 and the subsequent aggressive control operations greatly reduced the outbreak of malaria epidemics in Dembia and Fogera. More recently, mosquitoes have developed resistance to DDT and that has created a big challenge. However, the distribution of mosquito nets has reduced mortality rates.

During times of malaria epidemic people had been using various traditional methods of treating the disease, including using herbs, spices, honey, butter, garlic, ginger and the like. But in most cases these were desperate responses to the epidemic. Informants in Dembia and Fogera mentioned that they had never experienced significant changes in the preventive and remedial measures taken in the 1950s or earlier. They believed that traditional medicine has been in use since time immemorial and continued to be practised until after the 1953 outbreak until modern medicine undermined its value in the last decades of the twentieth century.

This study evidently suggests that there is a decline in practices and practitioners of traditional medicine. Residents are employing more modern protection mechanisms than traditional ones. Nevertheless, traditional knowledge and practices of malaria treatment still have much to offer society. Surveys of traditional medicine are needed for the proper documentation and preservation of indigenous knowledge and cultural practices. Moreover, further investigation is required to identify and evaluate the efficacy of these medicines and their scientific implications.

Despite great advances in modern medical treatment, the recent Ebola epidemic in West Africa shows that even in the twenty-first century, human beings are still vulnerable to new infectious diseases. Governments should thus be prepared to deal with potential health problems that may affect agricultural productivity. In conclusion, agricultural transformation requires a healthier rural population.

Notes

1 Informants: Mengist Addis, Melaku Wube, Gubena Beyene and Azage Fenta.

2 Gondar Archives (GA) Folder no. h2 Gondar Hospital to Ministry of Public Health, 21/09/45 E.C.; Russell Fontaine et al. (1961: 795).

3 GA, Folder no. 42, Governor of Debre Tabor to Governor General of Begemder and Semen, 05/04/43 E.C.

4 GA, Folder no. 42, Governor General of Begemder and Semen to the Regional Health Office, 07/05/43 E.C.

5 GA, Folder no. 42, Governor of Debre Tabor to Governor General of Begemder and Semen, 07/07/43, 12/07/43 E.C.

6 GA, Folder no. 42, Gondar Hospital to Naviga Tana Share Company, 04/09/43 E.C.

7 GA, Folder no. 42, Gondar *awrajja* to governor general of Begemder and Semen, 01/10/43 E.C.

8 GA, Folder no. 2, Dr Frick to Gondar hospital, 25/06/51.

- 9 GA, Folder no. 42, Gondar hospital to Governor General, 13/02/44 E.C.
- 10 GA, Folder no. 2, Andargachew Mesay, governor general to Tamrat Zegeye, 28/05/44 E.C.
- 11 GA, Folder no. 42, Fogera district governor to governor general of Begemder and Semen, 21/06/44 E.C.; Gondar hospital to governor general of Begemder and Semen, 05/07/44 E.C.
- 12 GA, Folder no. 2, Ministry of Public Health to governor general of Begemder and Semen, 12/09/44 E.C.
- 13 GA, Folder no. 2, Eighth Infantry Brigade to governor general of Begemder and Semen, 23/09/44 E.C.; Regional Police Deputy Commander to governor general of Begemder and Semen, 02/10/44 E.C.
- 14 GA, Folder no. 2, Gondar *awrajja* administration to Regional Public Health office, 03/10/44 E.C.
- 15 GA, Folder no. 2, Dembia district to Gondar *awrajja*, 14/10/44 E.C.
- 16 GA, Folder no. 2, Gondar hospital to governor general of Begemder and Semen, 27/10/44 E.C.
- 17 Ibid.
- 18 GA, Folder no. 42, Gondar hospital to governor general of Begemder and Semen, 18/11/44 E.C.
- 19 GA, Folder no. 42, Lt Col. Shiferaw Tesemma to governor general, 29/02/45 E.C.
- 20 GA, Folder no. 42, Dembia district to Gondar *awrajja*, 03/04/45 E.C.
- 21 GA, Folder no. 42, regional police to the Regional Public Health office, 12/09/45 E.C.
- 22 GA, Folder no. 32, regional police to Regional Public Health Office, 15/09/45 E.C.
- 23 GA, Folder no. 42, Semada district to Gayent *awrajja* administration, 09/06/45 E.C.
- 24 GA, Folder no. 2, Gondar hospital to Ministry of Public Health, 21/09/45 E.C.
- 25 GA, Folder no. 2, regional police to governor general, 27/09/45 E.C.
- 26 Ibid.
- 27 GA, Folder no. 32, Gondar hospital to governor general, 15/10/45 E.C.; Gondar hospital to Dembai district, 23/10/45 E.C.
- 28 GA, Folder no. 32, Tamrat Zegeye to Asrate Kassa, 22/10/45 E.C.
- 29 GA, Folder no. 42, regional police to Regional Public Health Office, 04/11/45 E.C.; GA, Folder no. h2, Gondar hospital to regional police, 10/11/45 E.C.
- 30 GA, Folder no. 32, Gondar *awrajja* to governor general, 18/11/45 E.C.
- 31 GA, Folder no. 42, Dembia district to Gondar *awrajja* administration, 09/12/45 E.C.
- 32 GA, Folder no. 2, Gondar *awrajja* administration to Gondar municipality, 02/01/46 E.C.
- 33 GA, Folder no. 2, Dembia district to Gondar *awrajja* administration, 24/12/45 E.C.
- 34 GA, Folder no. 2, Dembia district to Gondar *awrajja*, 29/01/46 E.C.
- 35 GA, Folder no. 42, Gondar *awrajja* to governor general, 09/02/46 E.C.
- 36 GA, Folder no. 42, Wonde Getahun to the regional diocese, 11/02/46 E.C.
- 37 GA, Folder no. 42, diocese to Public Health office, 16/02/46 E.C.
- 38 GA, Folder no. 42, Wolde Yesus Worqneh to governor general, 12/02/46 E.C.
- 39 GA, Folder no. 26, Mengistu Tesemma to Dembia district, 18/02/46 E.C.
- 40 GA, Folder no. 2, regional police to Gondar hospital, 07/03/46 E.C.
- 41 GA, Folder no. 42, Debesay Adhanom to Gondar hospital, 19/02/46 E.C.
- 42 GA, Folder no. 42, Gondar *awrajja* to governor general, 30/02/46 E.C.
- 43 GA, Folder no. 42, Debre Tabor *awrajja* to governor general, 03/03/46 E.C.
- 44 GA, Folder no. 2, governor general to Ministry of the Interior, 04/03/46 E.C.
- 45 GA, Folder no. 42, Gondar *awrajja* administration to governor general, 10/03/46 E.C.

46 GA, Folder no. 2, Gondar hospital to Ministry of Public Health, 09/03/46 E.C.; Folder no. h2, Gondar hospital to Regional Education Office, 15/03/46 E.C.

47 GA, Folder no. 42, Pasteur Institute to governor general, 16/03/46 E.C.

48 GA, Folder no. 42, Debre Tabor *awrajja* to governor general, 22/03/46 E.C.; regional police to Regional Public Health office, 10/04/46 E.C.

49 GA, Folder no. 32, Dr Graf Bassewitz to Ministry of Public Health, 05/01/54, pp. 1–2.

50 Ibid.

51 GA, Folder no. 42, Gondar *awrajja* governor to governor general, 20/05/46 E.C.; Folder no. h2, governor general to Regional Health Office, 21/05/46 E.C.

52 GA, Folder no. 2, Dr Jacoby's visit to Qolla Debba, 25/02/54.

53 GA, Folder no. 42, Dembia district to governor general, 2/7/46 E.C.

54 GA, Folder no. 26, governor of Gondar *awrajja* to governor general, 17/06/46 E.C.

55 GA, Folder no. 2, governor of Gondar *awrajja* to Asrate Kassa, 14/08/46 E.C.

56 GA, Folder no. 42, *Dejach* Asrate Kassa to *Ras* Abebe Aregay, 11/10/46 E.C.

57 GA, Folder no. 42, Abebe Aregay to Asrate Kassa, 24/12/46 E.C.

58 GA, Folder no. 2, Tsehayu Enqo Sellase to Abebe Aregay, 30/2/47 E.C.

59 GA, Folder no. 2, Dera-Fogera district to Debre Tabor *awrajja*, 11/04/48 E.C.

60 GA, Folder no. 42, Governorate Inspector to governor of Dembia, 25/04/47 E.C.; Folder no. 42, Governorate General to Ministry of Public Health, 27/05/47 E.C.

61 GA, Folder no. 42, Minister of the Interior to Asrate Kassa, 28/05/47 E.C.

62 GA, Folder no. 32, Gondar hospital to Ministry of Public Health, 05/08/47 E.C.; informants: Atanaw Shiferaw and Endalew Birqe.

63 GA, Folder no. 32, minutes of meeting, 09/08/55.

64 Informants: Berhan Tarekegn, Beza Aynalem, Masresha Wogayehu, Fente Birru, Alemu Ambaw and Atanaw Shiferaw.

65 GA, Folder no. 226, Gondar *awrajja* administration to governor general, 15/11/47 E.C.

66 GA, Folder no. 226, governor general to Gondar *awrajja* administration, 07/08/49 E.C.

67 GA, Folder no. 2, Debre Tabor *awrajja* to governor general, 07/03/48 E.C.; 05/05/48 E.C.

68 GA, Folder no. 42, Gondar Public Health College and Training Centre to Ketema Alemu, 26/05/48 E.C.

69 GA, Folder no. 2, Kefle Dadi to Kassa Meshesha, 02/08/49 E.C.

70 Informants: Aderajew Yalew, Amare Takkele, Beza Aynalem, Gebeya Achenef and Mengist Addis.

71 GA, Folder no. 2, North Gondar Zone administration to Dembia district council, 09/09/88 E.C.; North Gondar Health Department to North Gondar Zone administration, 14/04/89 E.C.

72 McCann (2005: 174); Reuters, 10 September 1998; *Chicago Tribune*, 11 September 2003.

73 GA, Folder no. 65, North Gondar Health Department to Dembia district health office, 25/09/89 E.C.; Dembia district to North Gondar Zone administration, 06/12/91 E.C.

References

ARCHIVES

- Gondar Archives (GA), Folder no. 42, Abebe Aregay to Asrate Kassa, 24/12/46 E.C.
- Folder no. 42, Dembia district to Gondar *Awrajja*, 03/04/45 E.C.
- Folder no. 42, Dembia district to governor general, 02/7/46 E.C.
- Folder no. 42, *Dejach* Asrate Kassa to *Ras* Abebe Aregay, 11/10/46 E.C.
- Folder no. 42, Governorate Inspector to governor of Dembia, 25/04/47 E.C.; Folder no. 42, Governorate General to Ministry of Public Health, 27/05/47 E.C.

- Folder no. 42, Minister of Interior to Asrate Kassa, 28/05/47 E.C.
- Folder no. 42, Dembia district to Gondar *awrajja* administration, 09/12/45 E.C.
- Folder no. 42, Deputy Commander of the Regional Police to governor general of Begemder and Semen, 10/11/44 E.C.
- Folder no. 42, diocese to Public Health office, 16/02/46 E.C.
- Folder no. 42, Fogera district governor to governor general of Begemder and Semen, 21/06/44 E.C.
- Folder no. 42, Gondar *awrajja* to governor general of Begemder and Semen, 01/10/43 E.C.
- Folder no. 42, Gondar *awrajja* to governor general, 09/02/46 E.C.
- Folder No. 42, Gondar hospital to governor general, 13/02/44 E.C.
- Folder no. 42, Gondar hospital to governor general of Begemder and Semen, 05/07/44 E.C.
- Folder no. 42, Gondar hospital to governor general of Begemder and Semen, 18/11/44 E.C.
- Folder no. 42, Gondar hospital to Naviga Tana Share Company, 04/09/43 E.C.
- Folder no. 42, Wonde Getahun to the regional diocese, 11/02/46 E.C.
- Folder no. 42, Wolde Yesus Worqneh to governor general, 12/02/46 E.C.
- Folder no. 42, governor of Debre Tabor *awrajja* to governor general of Begemder and Semen, 05/04/43 E.C.
- Folder no. 42, governor general of Begemder and Semen to the Regional Health Office, 07/05/43 E.C.
- Folder no. 42, governor of Debre Tabor to governor general of Begemder and Semen, 07/07/43, 12/07/43 E.C.
- Folder no. 42, Lt Col. Shiferaw Tesemma to governor general, 29/02/45 E.C.
- Folder no. 42, regional police to the Regional Public Health office, 12/09/45 E.C.
- Folder no. 42, regional police to Regional Public Health Office, 04/11/45 E.C.
- Folder no. 42, Semada district to Gayent *awrajja* administration, 09/06/45 E.C.
- Folder no. 42, Debesay Adhanom to Gondar hospital, 19/02/46 E.C.
- Folder no. 42, Gondar *awrajja* to governor general, 30/02/46 E.C.
- Folder no. 42, Debre Tabor *awrajja* to governor general, 03/03/46 E.C.
- Folder no. 42, Gondar *awrajja* administration to governor general, 10/03/46 E.C.
- Folder no. 42, Pasteur Institute to governor general, 16/03/46 E.C.
- Folder no. 42, Debre Tabor *awrajja* to governor general, 22/03/46 E.C.
- Folder no. 42, Gondar *awrajja* governor to governor general, 20/05/46 E.C.
- Folder no. 42, Gondar Public Health College and Training Centre to Ketema Alemu, 26/05/48 E.C.
- Folder no. 42, regional police to the Regional Public Health office, 10/04/46 E.C.
- Folder no. 2, Andargachew Mesay, governor general, to Tamrat Zegeye, 28/05/44 E.C.
- Folder No. 2, Dembia district to Gondar *awrajja*, 14/10/44 E.C.
- Folder no. 2, Dembia district to Gondar *awrajja* administration, 24/12/45 E.C.
- Folder no. 2, Dembia district to Gondar *awrajja*, 29/01/46 E.C.
- Folder no. 2, Dera-Fogera district to Debre Tabor *awrajja*, 11/04/48 E.C.
- Folder no. 2, Debre Tabor *awrajja* to governor general, 07/03/48 E.C.; 05/05/48 E.C.
- Folder No. 2, Dr Frick to Gondar hospital, 25/06/51.
- Folder No. 2, Eighth Infantry Brigade to governor general of Begemder and Semen, 23/09/44 E.C.
- Folder No. 2, Gondar *awrajja* administration to Gondar municipality, 02/01/46 E.C.
- Folder No. 2, Gondar *awrajja* administration to Regional Public Health office, 03/10/44 E.C.
- Folder No. 2, Gondar hospital to governor general of Begemder and Semen, 27/10/44 E.C.
- Folder no. 2, Gondar hospital to Ministry of Public Health, 21/09/45 E.C.
- Folder no. 2, Gondar hospital to regional police, 10/11/45 E.C.

- Folder no. 2, Kefle Dadi to Kassa Meshesha, 02/08/49 E.C.
- Folder No. 2, Ministry of Public Health to governor general of Begemder and Semen, 12/09/44 E.C.
- Folder No. 2, Regional Police Deputy Commander to governor general of Begemder and Semen, 02/10/44 E.C.
- Folder no. 2, regional police to governor general, 27/09/45 E.C.
- Folder no. 2, regional police to Gondar hospital, 07/03/46 E.C.
- Folder no. 2, governor general to Ministry of the Interior, 04/03/46 E.C.
- Folder no. 2, Gondar hospital to Ministry of Public Health, 09/03/46 E.C.
- Folder no. 2, Gondar hospital to Regional Education office, 15/03/46 E.C.
- Folder no. 2, governor general to Regional Health office, 21/05/46 E.C.
- Folder no. 2, Dr Jacoby's visit to Qolla Debba, 25/02/54.
- Folder no. 2, governor of Gondar *awrajja* to Asrate Kassa, 14/08/46 E.C.
- Folder no. 2, North Gondar Zone administration to Dembia district council, 09/09/88 E.C.
- Folder no. 2, North Gondar Health Department to North Gondar Zone administration, 14/04/89 E.C.
- Folder no. 2, Tsehayu Enqo Sellase to Abebe Aregay, 30/2/47 E.C.
- Folder no. 226, Gondar *awrajja* administration to governor general, 15/11/47 E.C.
- Folder no. 226, governor general to Gondar *awrajja* administration, 07/08/49 E.C.
- Folder no. 65, North Gondar Health Department to Dembia District Health office, 25/09/89 E.C.
- Folder no. 65, Dembia district to North Gondar Zone administration, 06/12/91 E.C.
- Folder no. 26, governor of Gondar *awrajja* to governor general, 17/06/46 E.C.
- Folder no. 26, Mengistu Tesemma to Dembia district, 18/02/46 E.C.
- Folder no. 32, Dembia district to governor general, 15/10/45 E.C.
- Folder no. 32, Dr Graf Bassewitz to Ministry of Public Health, 05/01/54.
- Folder no. 32, Gondar *awrajja* to governor general, 18/11/45 E.C.
- Folder no. 32, Gondar hospital to governor general, 15/10/45 E.C.
- Folder no. 32, Gondar hospital to Dembai district, 23/10/45 E.C.
- Folder no. 32, Gondar hospital to Ministry of Public Health, 05/08/47 E.C.
- Folder no. 32, minutes of meeting, 09/08/55.
- Folder no. 32, regional police to Regional Public Health office, 15/09/45 E.C.
- Folder no. 32, Tamrat Zegeye to Asrate Kassa, 22/10/45 E.C.

PUBLISHED AND UNPUBLISHED SOURCES

- Ashenafi Woldemichael (2008) 'Changes in the spread of malaria in Ethiopia: the case of Awassa and Hossana 2006–2007', MSc thesis in Environmental Health, Telemark University Collage, Norway.
- Assenso-Okyerere, K. and D. Ayalew (2011) 'The interaction between health and farm labor productivity in Africa', addis2011.ifpri.info/files/2011/10/The-Interaction-between-Health-and-Farm-Labor-Productivity-in-Africa1.pdf.
- Aynalem Adugna (n.d.) 'Malaria in Ethiopia', Mimeo.
- Biscoe, M., C. Mutero, R. Kramer et al. (2004) 'Status of DDT use for malaria control in Ethiopia, Uganda, Kenya and South Africa', Working Paper 95, International Water Management Institute.
- Carter Center (2012) 'Summary Proceedings, Third Annual Malaria Control Program Review: Ethiopia and Nigeria', Atlanta, GA.
- Fontaine, R., A. Najjar and J. Prince (1961) 'The 1958 malaria epidemic in Ethiopia', *American Journal of Tropical Medicine and Hygiene*, 10(6): 795–803.
- Kissi, E. (2000) 'The politics of famine in U.S. relations with Ethiopia, 1950–

- 1970', *International Journal of African Historical Studies*, 33(1): 113–31.
- Kiszewski, A. E. and Awash Teklehaimanot (2004) 'A review of the clinical and epidemiologic burdens of epidemic malaria', *American Journal of Tropical Medicine and Hygiene*, 72(2): 128–35.
- Lindsay, S. and W. Martens (1998) 'Malaria in the African highlands: past, present and future', *Bulletin of the World Health Organization*, 76(1): 33–45.
- McCann, J. (2005) *Maize and Grace: Africa's Encounter with a New World Crop, 1500–2000*, Cambridge, MA: Harvard University Press.
- Pankhurst, R. (1986) *The History of Famine and Epidemics in Ethiopia Prior to the Twentieth Century*, London.
- Ulimwengu, J. (2009) 'Farmers' health and agricultural productivity in rural Ethiopia', *African Journal of Agricultural and Resource Economics*, 3(2): 83–100.
- USAID (2009) *President's Malaria Initiative Malaria Operational Plan (MOP)*, Ethiopia.
- Wakgari Deressa (2003) 'The retirement of malaria control workers as a critical problem for vector control in Oromia, Ethiopia', *Ethiopian Journal of Health and Development*, 17(1): 79–83.
- (2005) 'Economic costs of epidemic malaria to households in rural Ethiopia', *Tropical Medicine and International Health*, 12(10): 1148–56.
- Wakgari Deressa, Ahmed Ali and Damen Hailemariam (2008) 'Malaria-related health-seeking behaviour and challenges for care providers in rural Ethiopia: implications for control', *Journal of Biosocial Science*, 40(1): 115–35.
- Wakgari Deressa, Dereje Olana and Shellem Chibsa (2005) 'Community participation in malaria epidemic control in highland areas of southern Oromia, Ethiopia', *Ethiopian Journal of Health and Development*, 19(1): 3–10.

LIST OF INFORMANTS

No.	Name of informants	Place of interview	Date of interview	Remarks
1.	Aderajew Yalew	Shina, Fogera	20/01/2014	Farmer residing in Shina, Fogera. He remembers the malaria epidemics of the 1950s.
2.	Alemu Ambaw	Guramba, Dembia	07/12/2013	Lives in Guramba, one of the areas hardest hit by malaria epidemics.
3.	Amare Takkele	Arebia, Dembia	26/01/2015	Farmer living in Arebia Medhanealem, one of the areas highly affected by malaria epidemics.
4.	Atanaw Shiferaw	Qolla Debba, Dembia	07/12/2013	Resides in the town of Qolla Debba. A very good oral historian.
5.	Berhan Tarekegn	Achera Maryam, Dembia	28/01/2015	Lives in one of the areas that was repeatedly affected by malaria.

No.	Name of informants	Place of interview	Date of interview	Remarks
6.	Beza Aynalem	Zengaj, Dembia	30/01/2015	A priest in Zengaj, one of the localities hard hit by malaria epidemics.
7.	Endalew Birqe	Qolla Debba, Dembia	07/12/2013	Resides in the town of Qolla Debba and has experienced malaria.
8.	Fente Birru	Achera Maryam, Dembia	28/01/2015	A farmer residing in Achera Maryam, an area where many people died of malaria.
9.	Gebeya Achenef	Zengaj, Dembia	30/01/2015	A farmer in Zengaj who knows a lot about malaria epidemics.
10.	Masresha Wogayehu	Arebia, Dembia	26/01/2015	Had been a victim of malaria infection in the 1950s.
11.	Mazengia Azene	Achera Maryam, Dembia	28/01/2015	Witnessed the death of many people because of the malaria epidemics.
12.	Mengist Addis	Shina, Fogera	20/01/2014	A priest residing in Shina who witnessed the death of many people.

7 | Women farmers' land rights in the context of constraining cultural norms¹

Mulunesh Abebe Alebachew

Introduction

There are two groups of women who actively contribute to the existence and growth of smallholder agriculture. The majority of them are found in marital life in male-headed households, constituting up to 50 per cent of the farming labour force and taking care of home activities, such as cooking, cleaning and caring. There is also a sizeable proportion, about 10–20 per cent, of rural households that are headed by women. These female-headed households are insufficiently considered in agricultural policies despite the particularly challenging conditions they face. Often, women-headed households are disadvantaged in terms of access to land, access to credit and other productive resources. They typically have fewer male members and less labour available, and often have a high ratio of dependent-to-active family members (Frank 1999). As a result, female-headed households are often poorer and more vulnerable than male-headed households (FAO 2011).

In contexts where poverty and food insecurity are major issues, both short- and long-term outcomes of policy and development interventions are highly dependent on how disadvantaged groups of rural people are considered. Improving marginalized and disadvantaged groups of people's access to basic resources has direct positive outcomes. As empirical studies indicate, if female smallholder farmers were given as much access to essential agricultural assets and inputs as their male counterparts, their agricultural outputs would increase by 20–30 per cent (Asres et al. 2015). This is in line with the general pattern observed in developing countries (Anaglo et al. 2014; Oni et al. 2010).

In Ethiopia, despite the significant contribution of female smallholders to food and nutrition security of households, women and other marginalized groups of people continue to be vulnerable. This chapter addresses the gender-related challenges of agricultural change. It discusses local views about the constraints, challenges and opportunities of rural women.

Methods

This chapter is the outcome of a research programme that was carried out between 2014 and 2015 by a team of researchers from Bahir Dar University (BDU) in collaboration with the Amhara National Regional State Supreme Court and the Bureau of Environmental Protection and Land Administration, funded by USAID-LAND. The overall objective of the research programme was to investigate the challenges, gaps, problems and limitations of a rural land reform that was introduced by the national and regional governments. The land reform incorporated both federal and regional provisions and laws that aimed at enforcing allocation, demarcation and registration of rural land among rural households. The author of this chapter held the position of 'gender specialist' and was a member of the research team from BDU. The research project was conducted in six zones, fifteen '*woredas*' (districts) and thirty '*kebeles*' (the lowest administrative unit) of Amhara regional state.

The research project had eight thematic areas. One of the thematic areas was an investigation of the status of marginalized and disadvantaged groups of people in the rural land reform. Women (both married and single), the elderly, orphans, people with disabilities and other vulnerable groups were the target of the study. Both quantitative and qualitative methods of research were used to generate data. Quantitative data were collected through a survey. A total of 420 households participated in the survey; among these, one third were women farmers. The qualitative study utilized focus group discussions (FGDs). Sixty FGDs were conducted with rural farmers at *kebele* level. Half of these FGDs were conducted with women farmers. At *woreda* level, thirty FGDs were conducted with stakeholders, including judges, officials of land administration, women, children and youth affairs, and women's associations and organizations handling grievances. In this chapter, the findings pertaining to the constraints, challenges and opportunities experienced by women farmers with regard to access to and control over land are presented along with the relevant existing literature.

Gendered agriculture

Cultural norms in agriculture: the case of ploughing Farming is a multi-stage process that includes land preparation, ploughing, sowing, weeding, fertilizer application, harvesting, threshing and storing. These activities require a variety of resources and assets, including land, water, labour, animals or modern technology, inputs (seeds, fertilizers, pesticides) and different tools. In most of these farming activities, men and women engage more or less equally. On average, women constitute about 43 per cent of the labour force involved in these farming activities (Asrat and Getnet 2014). In addition to their direct contributions, women are almost exclusively responsible for performing household activities, including food preparation, animal husbandry and other

activities, which are essential to ensure that farming activities take place. When these farm- and non-farm-related labour activities are taken into account, the proportion of labour contributed by women in the context of rural smallholder farming households is as high as 75 per cent (Frank 1999; Mebrat 2011).

Ironically, despite their significant contribution, women are often identified as wives, but not as farmers. This is a reflection of much broader and deep-seated cultural norms and asymmetric power relations among the population. The prevalent norm is that many farming activities are not gender neutral in terms of how local people value them. For example, the local values and narratives around the activity 'farming' are interesting. In the local understanding, 'farming' is equated with 'ploughing' and ploughing is conceived as more important than the other activities. Traditionally, ploughing as an activity has been regarded as men's exclusive task and it signifies masculinity and strength.

Some studies have examined whether 'ploughing' is beyond women's physical capacity. A closer analysis of the tools used and the role of oxen shows that ploughing is actually not a strenuous activity and women can undertake it. Asrat and Getnet argue strongly that the oxen ploughing instrument used in Ethiopia is very light owing to its simple wooden and metallic structure (Asrat and Getnet 2014). In addition to this, modelling of the forces needed to operate the plough indicates that manoeuvring skills rather than physical force are the determinant factor in operating the plough (*ibid.*). Field observations also support this. In some cases, it is common to see boys as young as ten to fourteen ploughing with a pair of oxen. If the physical strength of ten- to fourteen-year-old boys is sufficient to undertake ploughing, a physically mature woman should also be able to do it. Thus, from the perspective of physical strength, there is no concrete evidence that validates the belief that women cannot operate the plough. In fact there are cases, although rare, where women do carry out ploughing (Mebrat 2011; Aboma 2000).

However, community- or societal-level changes in gender relations in agriculture have not yet emerged. One particular case where a community has attempted to transform agricultural gender relations and household activities is the Awra Amba community initiative in Amhara region. In this community, women and men participate equally in all types of farming and household activities interchangeably and without any notion of a gendered division of household and agricultural activities. Interestingly, for such changes to take place, the community had an active leadership and clear ideology. The initiative was founded on concepts that embrace gender and social equality, absence of organized religion and caring for the elderly (Eden 2009).

The values and ideology of the Awra Amba community have been widely popularized through public mass media and visits by people from different parts of the country. However, replication of such social experiences has not emerged. For a society that is deeply rooted in religious and cultural norms,

such initiatives are too radical, and the Awra Amba community's initiative has remained a special social experiment that has not been able to spread to the rest of the society. In fact, it faces resistance, even hostility, from the public in general (Duncan 2013). With such fierce resistance from the wider society, the received norm of gendered practices of agriculture continues to be dominant.

As women farmers continue to depend on men's skills, particularly with regard to ploughing, they continue to be vulnerable to various social and economic disadvantages, especially when they are separated, divorced or widowed. One major decision single women farmers make is that of leasing out their land to other male farmers. This decision is taken even when women farmers have their own plots of land, oxen and other agricultural inputs. The findings of the evaluation of rural land policy implementation show that, owing to the perceived inability of women to plough, they often lease or rent their land to other farmers.

Our study also reveals that, in addition to the economic loss, leasing out of land entails other potential complications. These include lack of proper care for the land (i.e. not using modern agricultural inputs, not protecting the land from degradation), delays in farming activities (i.e. ploughing, sowing, weeding, harvesting, etc.), breach of contractual agreements and even refusal to share the agricultural produce.

The research also found that women farmers rarely cultivate their land-holdings on their own. They cultivate it with the help of family members and relatives. In these cases, they may face challenges, including; denial of landholding rights and transferring of landholding rights as a result of corrupt dealings with the local land administration officials, the local traditional court (*kebele shengo*) and others, who sell or exchange land with a third party without informing the owner of the land and other relevant bodies. In every selected *woreda* and *kebele*, women farmers faced challenges of this nature to varying degrees. For instance, in Bahir Dar Zuraia, which is the periphery of the capital city of Amhara regional state, we had four informants (women) who lost the rights to their land. The informants were initially renting out their land to local sharecroppers, but over the course of the time they ended up losing it. This is despite the fact that the landowners were registered as taxpayers, which provides the formal/official entitlement to land. One of these women narrated her story in this regard as follows.

I am paying tax, collecting and selling firewood, but he [the person who rents the land plot] is cultivating and fully benefiting from my own land without even paying any tax to the government. Although I have already got the land registration certificate from the land administration office after

it has been commented on by the general public, still I could not regain my plot of land practically, which I leased for him in cash because of my inability to plough by my own. I am a woman with no power to plough or challenge him physically.

There were various similar cases in many of the study sites, indicating that violations of women's land rights are prevalent.

Agriculture extension systems and women smallholder farmers

Agricultural extension systems are one of the most important strategies designed by the government to enhance the output of smallholder agricultural practices, thereby improving the livelihoods of rural households. However, the government dominates both financing and delivery of the agricultural extension systems; the systems are highly centralized and top-down in their approaches; and they involve a limited number of actors. Within these overall structural features, there have been initiatives to decentralize the extension systems. This decentralization process, however, entails transfer of functions to lower-level bodies which are upwardly accountable to the central government.

Another major issue, which has not received much research attention, is the gender dimensions of extension systems. Our assessment indicates that gender issues of rural people are not well addressed in the agricultural extension systems. For instance, extension services primarily focus on male farmers rather than women farmers and they are undifferentiated. In the Amhara region, only 15.8 per cent of women-headed households were reported as beneficiaries of extension services, while the corresponding figure for male-headed households was about 71 per cent (Asres et al. 2015). Asres et al. also argue that the extension systems are neglecting not only women, but also poorer men. The top five reasons provided for the low participation of female-headed households in the agricultural extension programmes are: (1) negative attitude of extension workers towards women farmers, (2) shortage of family labour, (3) lack of credit access, (4) low education level and (5) the high price of agricultural inputs.

In this regard, the skills and attitudes of the agricultural extension workers towards women farmers need critical analysis. The fact that the extension service programme is run mostly by male workers implies that female-headed households are likely to face systemic discrimination in extension services.

Regarding access to agricultural inputs and assets such as water, improved seeds, fertilizers, credit and improved technologies, including farm tools and household equipment, empirical research findings indicate that these services and assets are less available and affordable for women farmers than for their male counterparts (Sisay 2008).

These challenges have implicit and explicit consequences for women farmers' livelihood security and their social status, as well as presenting a limiting factor for the prospect of agricultural change. Firstly, they undermine the potential of women in farming and restrict their roles to domestic farming activity, micro-level livestock production and supportive roles. This has important implications for the potential of women to acquire key skills and to develop capacity. Secondly, they situate women farmers in a secondary role in the agricultural system, subsumed within the dominant cultural norms of male domination. Thirdly, they place women farmers in a subordinate social and economic status. Fourthly, this has significant implications for the gender-role socialization of girls, who are likely to continue in subordinate position like their mothers.

Land rights and women smallholder farmers Land is a crucial economic resource in rural Ethiopia. Access to productive and fertile land allows farmers to improve their food security and to build a more sustainable livelihood system (Almaz 2007). Equitable access to and control of land by farmers also play positive roles in promoting dignity, identity, social inclusion and empowerment of people (Hoden and Tewodros 2008). Despite the well-recognized significance of land, addressing equitable land access for marginalized groups of smallholders, including women, continues to be a challenge. One particular example of this is that women's rights to and control over their land and other properties are often vulnerable and unprotected by the rule of law (Pallas 2011), and are influenced by social and cultural factors (Jonckheere et al. 2013; Paydar 2012; Rwandan Women Network 2011).

In terms of developing and enforcing legal frameworks and supporting women's rights to land, Ethiopia and the Amhara region in particular have made important progress during the last two decades. Ethiopia has constitutionally ratified and incorporated various international and continental legal frameworks that aim to improve women's rights (African Women's Rights Newsletter 2010). The country's lately revised Rural Land Administration and Land Use Proclamation No.133/2006 (FDRE 2012) indicates the specific rights and conditions of landownership, administration, use, transfer and other pertinent issues for women. Article 5(2) of the Proclamation states that '*Any farmer residing in the Region shall, despite gender or any other reasons of difference, have equal rights to get land in holding.*' In this Proclamation, there are also efforts to recognize the challenging conditions of marginalized and vulnerable groups of people, including women. This is stated in the Proclamation's Article 5(6) and Article 9(1). Article 9(1) states that '*The provision of land shall be made to all applicants impartially, having a right to acquire land in holding based on petitioners' interest and a sequence to be determined by the participation of people.*' Article 9(2) clarifies the above

statement: *‘Notwithstanding provision of sub-article 1 of this article, where the land to be distributed is not available to all petitioners with equal magnitude of landholding problem, it shall priorly be caused to be given to orphan children, disabled, women and youngsters who join the new life of independence, consecutively.’*

The land law allows obtaining joint land certificates; transferring landholding rights as a donation or gift; and equal participation (of joint holders) in decision-making. These provisions are stated under Articles 17 and 24 respectively. Article 17(3) states that *‘Where the landholding is a common holding of a husband and wife or other persons, the gift shall only be applicable in agreement of both the husband and wife or other common holders.’* Article 24(2) states that when the land is held as joint property (by a married couple), the landholding certificate shall be prepared in the names of both members of the couple. Article 24(3) further states that when marriage occurs after the issuance of a certificate in the name of either of the spouses or both of them, they have the right to register the land as a joint property.

The aforementioned land right provisions provide conducive legislative grounds to empower women and other marginalized groups of people. However, they are not sufficient. Various other social and cultural factors undermine legal land rights. Implementation, enforcement and maintaining land rights over time often face resistance from powerful individuals and groups of people (Berhanu and Fayera 2005; Hirut and Giovarelli 2013; Kumar and Quisumbing 2014; Mintewab and Holden 2010; Rorisa 2013; Yonas 2011). The same pattern is also observed in other African countries and other parts of the world (Pallas 2011; Paydar 2012).

Our study indicates that the use of land registration certificates reduces the landlessness of women. Ninety-six per cent of women farmers reported that they had received land registration certificates. Similarly, the respondents were also positive about equitable access to land. About 85 per cent of respondents believed that land redistribution had ensured women’s equal access to land. These are major indicators that progress has been made in addressing equitable distribution of land among rural households.

However, our informants indicated that women still face challenges in their everyday land use practices. The nature of the problems may range from loss of land rights due to corruption in the local court to systemic overexploitation of their resources by their male counterparts. These challenges were prevalent among single women and women undergoing a divorce process. The following reasons were given for why this particular group of women are highly exposed to different forms of violation and abuse of rights. One is that marginalized groups of people, including single women, lack knowledge about the legal systems. This is related to low levels of education, as well as lack of awareness and information about land rights. Limited awareness about the legal

procedures and the poor justice system were among the main reasons leading to the loss of landholdings in the study areas.

Second, and related to the above, is poor service and infrastructure in the legal system. Inaccessibility of legal services, corruption in the government structures (including among judges, land administration officials, *kebele* committee members and sometimes local '*shimagle*' [elderly people who negotiate between the parties during a dispute on land or other issues]), informal or lack of written agreements (agreements on sharecropping, hiring of labour and land renting among others) and lack of negotiation skills were key factors exposing women to the possibility of abuse, manipulation and even the loss of tenure security.

The third factor is low or limited participation and representation of marginalized groups of people in the local land reform committee, which constitutes the local decision-making body on land measurement and registration.

Fourth, customary norms and traditions were also reported as hindering women smallholder farmers in exercising certain activities on their land. For instance, the religious and cultural views that negate women's attempts to carry out ploughing were too strong and constraining. One consequence of this is that women had to enter into sharecropping and other land lease agreements with men. For these and other reasons, women are the major source of land lease. As they enter into short- or long-term local land lease arrangements, some of them are exposed to various forms of abuse, manipulation and tenure insecurity.

Finally, although the land and legal system embraces all farmers, women in polygamous marriage relations still abide by customary laws of inheritance and marriage. Such marital arrangements are practised among the Muslim communities. The land rights policy assumes monogamous households. As a result, there are no clear legal provisions for women in polygamous marriages. Land administration experts and officials at *woreda* level showed limitations in handling such a sensitive issue. For these reasons, handling of cases of land disputes in polygamous marriage relations swings between the religious elders and the formal judiciary systems. Our observation indicates that attempts by men to exclude their wives from landownership registration through negotiating informally with the land administration committees were reported among the Muslim communities. Misinterpretations, distortions or manipulations of rights by judges and others involved in the land administration process, as well as unfair treatment of women by traditional arbitrators during land disputes, were reported as the mechanisms by which rights are violated. Land disputes could involve unfair division of land during separation or breach of contract in sharecropping or land rent agreements. One way or another, these challenges are about power relations at different levels that are reinforced by cultural norms and traditions. The aforementioned challenges and constraints

faced by women smallholder farmers indicate that a lot has to be done in order to make them equal beneficiaries of their landholding rights with their men counterparts, to enhance the livelihood security of households and bring about /agricultural transformation at large.

Selected descriptions from the qualitative data

1. EXAMPLES THAT ILLUSTRATE PROBLEMS RELATED TO THE LAND ADMINISTRATION AND JUSTICE SYSTEM Women and key informant discussants in all selected study sites raised various issues about the challenges women smallholder farmers face with regard to their land use rights. One of the women discussants in one of the selected *woredas* described these problems as follows:

There are many problems with the ‘kebele’ land administration officials; they give one plot of land for two or more people at a time. Using their power as instrument, they would take somebody’s land without any legal ground and give it to somebody else. The problem is from ‘kebele’ to ‘woreda’ level. There are many arguments and conflicts with regard to land in our ‘woreda’. We all are living with great doubt. There are many problems with the land registration certificate. For instance, while the plot of land is practically three hectare, it might be registered as two hectare. I am paying tax for three hectare but what is registered is only the two hectare. My sister had four hectares but the registered was only one hectare; later the ‘kebele’ took the three hectare from her because they said it is illegal. When we apply to them for corrections, they always say it will be corrected but there are no practical actions taken so far. There are also many people who do not have land registration certificates.

Women also face discrimination in applying laws in their struggle to protect their land rights. A woman discussant described what she felt and observed about the implementation of the land laws as follows:

Does the statute only work against women? Why does not it apply against men? I have raised this and other similar issues related to the rural land law for the ‘woreda’ Council ... I get too sick when I think about the statute of limitation. For instance, there was an orphan girl; her deceased father had sold his land illegally to a rich peasant while she was an infant. When she tried to regain the landholding with the support of her legal guardian and public prosecutor, the local court decided that she reclaimed half a hectare of land. But the man who bought the land was unwilling to hand over the land pursuant to the decision of the ‘woreda’ court. Later on, the decision was reversed in favour of him.

Corruption is also one of the challenges women smallholder farmers face. A woman in Bahir Dar Zuria *woreda*, ‘Yibab’ *kebele*, said: ‘As short and tall

people cannot walk alike, poor and rich people are not treated equally at court.' Another woman said: 'The "woreda" people are better but the Supreme Court is the most corrupted one. It is completely corrupted; it is just like a murderer who slaughters people in public. The people in the Supreme Court are not ready to hear and understand the problems of poor people.'

2. EXAMPLES THAT ILLUSTRATE WOMEN SMALLHOLDER FARMERS' CHALLENGES IN SECURING THEIR LAND RIGHTS OWING TO CULTURAL FACTORS A woman in Oromo Zone of the Amhara region described the problems women face with regard to land and other rights owing to cultural factors, with particular reference to Muslim women, as follows:

There are numerous women who are oppressed but they do not reveal their situation because of fear of their husbands. Their husbands may take revenge on them if they find out about their appeals. Women are living in frustration fearing revenge from their husbands. Fathers, husbands and brothers may collaborate to oppress women. The problem is not due to lack of awareness of the law, but resistance from the religious leaders is very strong. For this reason, women do not seek intervention of 'shimagle' [local elderly mediators]. At the time of divorce women are often given only 100 birr [equivalent to US\$4.76], it is called 'haqe' in the Muslim tradition.. For instance, I was divorced from my deceased husband before his death and I was given only 100 birr, leaving behind my land and other properties to him. If wives are courageous enough to request their rights through the government law, they can share everything equally. However, there are strong social pressures on such kinds of women.

Discussants in Oromo Zone told how when fathers or husbands die, land-holding certificates are issued in the name of brothers or other male family members. When women seek to fight for their legal rights they face strong social pressures or social exclusion by the community. The following real-life story told by one of the discussants vividly shows the practical challenges women face in the process of their struggle for their legal rights.

There was a woman who was living with her husband. While they were living peacefully, the husband died. The couple had a land registration certificate. When the husband died, her brother-in-laws and other family members of her deceased husband took her land using the 'Sharia' law [i.e. the Islamic law] as a pretext. Then this woman applied to the court and while her case was in the legal process, she got sick and died. When her family tried to bury her body at the designated Muslim burial place, the local people and religious leaders refused to bury her body in their burial place. Their reason was this woman had refused to abide by their religious

law, so she did not deserve to be buried in the place where ‘decent’ Islamic followers are to be buried. Although her family members had tried their best, they could not convince the community, and then they buried her body by the roadside.

This kind of extreme social exclusion is culturally unbearable for the relatives of the deceased person and effectively prevents these women from fighting for their rights.

Despite such grave oppressions, there are also very resilient women who are able to regain their rights. The following narrative shows the amazing resilience of a woman farmer who thrived on her challenges and regained her land rights.

Women are facing many challenges; their lands are taken inappropriately by others, adjacent farmers often plough women’s lands, pushing borders. For instance, when my husband died, my home was destroyed and I was chased out from my place of residence by my deceased husband’s family members in collaboration with the ‘kebele’ administration. Then I applied my case to court and now I have returned to my place of residence, my house is rebuilt again. The ‘kebele’ administration was trying to favour my husband’s family members. Before they chased me out, they were also trying a lot of things on me. For instance, they were attempting to destroy my house so many times; they forcefully took four sheep, an ox and a cow from me. I applied my case to the court, and the court gave its verdict in favour of me. Then they returned all of my properties they took and they paid me 14,000 birr [nearly US\$665] as compensation. While I was following my case, they were threatening me but I was determined to continue up to death for the sake of my children. After the court gave its verdict, we also negotiated with local ‘shimagle’ and now I am living peacefully.

3. SIGNIFICANCE OF THE POLICY ENFORCEMENT ON LAND RIGHTS The findings of the rural land law implementation evaluation research also indicated that in spite of the aforementioned and other challenges and obstacles, women farmers in Amhara region, particularly married women, have obtained numerous benefits from their land right provisions as compared to what was previously possible. These include:

- Improved participation in decision-making and bargaining power of married women.
- Increased respect for women on the part of husbands.
- Improved sense of ownership, confidence and care for their landholdings, home or marital life owing to the provision of equal rights in every aspect.
- Improved productivity and lifestyles.

- Improved marriage stability.
- Increased eligibility for marriage for women who own land.
- Increased participation of women in productive activities out of the home.
- Improved sharing of household chores.
- Significantly decline in wife beating.
- Improved equal property sharing compared to the situation under the previous regime.

The following narrative by one of the discussants in one of the selected *kebeles* vividly shows the benefits of land right provisions for women small-holder farmers.

Now we are able to decide equally. Nowadays, land is the most valuable property for marriage, not cattle or other properties; no man is willing to marry a woman who is landless. A woman who has land can lead a stable marital life. A woman who does not have landholding does not have a right to decide, she does not have a stable marital life either. Her husband would say at any time 'leave me alone, I will find and marry a woman who has land'. He might not care even about the fate of their children.

Another woman said, 'In earlier times when we did not have equal rights, we did not have a sense of ownership for our home. This was because we were not sure whether our home is ours and we were not motivated to carry out even our daily household chores.'

Gender division of labour, agriculture and the future generation

In patriarchal societies like Ethiopia, biological differences of male and female are translated into gendered differences between men and women, or boys and girls, through the process of social construction or socialization (Chornesky 2000; Kabeer 2003). This socialization leads to them having different roles, responsibilities, expectations, values, identities, opportunities and power in and out of the family. As a result, in many societies, gendered roles are valued differently; women are not expected to perform equally or in the same way, do not get equal opportunities, do not have equal power of decision-making on resources and even on themselves and have different identities (Hesse-Biber and Yaiser 2004; Kabeer 2003).

This socialization process often starts at birth and it continues through life, passing from generation to generation. This perpetuation and transgenerational continuity is the result of interacting contributions from family, community and society. As a result, men and women, boys and girls are socialized to behave differently, perform different roles and obtain different opportunities that place males in advantaged and females in disadvantaged social positions. Except for very few biological roles, most of the roles, responsibilities

and divisions of labour assigned to women and men are learned, and differ from one culture to another, subject to change through time, education and development. However, most of the socially assigned characteristics of men and women, including the gender division of labour, are misperceived by most of the Third World societies as natural, unchangeable and likely to prevail long time into the future.

Unfortunately, the gendered characteristics and divisions of labour that are culturally assigned to women and girls are less valued, unpaid, time- and labour-intensive. This in turn places women and girls in a subordinate position. In order to enhance the efforts undertaken by countries to empower women and girls, this gendered division of labour should be challenged and transformed. As with the gender division of labour in other activities, in farming there are few activities almost exclusively performed by men in most societies of Ethiopia, including in Amhara. These farming activities performed exclusively by males are ploughing and, to lesser extent, sowing. Activities like household chores, child rearing and caring for the elderly are almost exclusively performed by women and girls. Some activities, such as hoeing, weeding, harvesting, transporting and storing, are carried out by both sexes in varying but relatively comparable proportions (Asres et al. 2015). The values associated with these gendered men's and women's farming roles are highly different. Farming activities performed exclusively by men are not only highly valued, but are often understood as equating with farming overall. In contrast, farming activities performed exclusively by women are undervalued by the community, agricultural extension workers and women themselves, despite their importance in sustaining farming activities and families' livelihoods. Although women participate in most of the farming activities, and they work half as long again as men, women are not often considered farmers. This is due to the hegemonic gender structures and assigned meanings in smallholder farming emanating from patriarchal gender relations. Asrat and Getnet (2014: 8) vividly described this state of affair as follows:

Women are placed in the position of helpers and caretakers to the men who do the 'real farming' due to the symbolic and somatic association of the plough (and to a lesser extent, the ox) with the male farmer as well as the ways in which the bodies of men and women are socially constructed. There are often quite strict boundaries between what men and women can and cannot do.

This strict gender division of labour has not only put women in a subordinate position owing to the cultural perception of farmers, but also serves to exclude women from the easy but important task of ploughing. This disadvantage is more evident when the woman is divorced, widowed or separated. In such scenarios, the woman has to find a man to plough her land in a way that is

disadvantageous for her family's livelihood, often in a less productive manner owing to delayed land preparation, sowing, weeding, harvesting and lesser/no use of fertilizers and other modern agricultural inputs. If she had ploughing skills, using her experience of working for long hours, she could make her land at least as productive as it was while her husband was farming, if not more so. Therefore, transformation of this gender-based division of labour in farming, which precludes women smallholder farmers from the main mode of production (i.e. ploughing), will help families to break out from hunger and increase the country's productivity.

The existing gender-based division of labour is disadvantageous not only for women, but also for men. Owing to the gender-based division of labour, almost all rural men and young boys lack skills required to perform household tasks as simple as preparing breakfast. As a result, they are entirely dependent on women or girls for their daily feeding and their mere survival. It is not uncommon to see a man and his children starving when the wife is not around owing to divorce, separation, illness, death or even for a short stay out of the home for various reasons. Until she returns home, or another woman is found, no male family member is ready to take care of household activities in the dominant Amhara culture. Therefore, breaking the boundaries of the gender-based division labour is of paramount importance for women and men, boys and girls in allowing them to be self-reliant citizens, as well as for families and societies to sustain fully functioning members in cases such as family breakdown.

According to Asrat and Getnet (2014), the gendered nature of agricultural and rural life is also visible in rural boys and girls. Children participate in agricultural and household activities supporting their parents from an early age. Their activities are based on gender, as seen in adults. Both boys and girls participate in weeding and hoeing, and most boys and a few girls participate in looking after cattle. Only boys perform ploughing, helping their fathers and identifying themselves as farmers. After helping their parents with ploughing, they play in the fields and have more time to read books and do their homework. This puts them in a better position in terms of academic achievements and future success. On the other hand, only girls participate in helping their mothers and sisters in household chores, including cooking, feeding and washing clothes. As a result of the huge burden of work at home, girls have little or no time to read books, do their homework or play, given their extended working hours. This is a great disadvantage for girls' academic achievement as well as for their future life. In addition to the immediate effects on school performance, health and happiness, childhood gender roles have their own effects on women's and men's entry route into farming, which in turn is documented as having significant implications for their later farming activities and their relative positioning within the farming family structure.

Conclusion

In the last two decades, there have been a lot of achievements in Ethiopia in addressing both married and unmarried women farmers' needs and concerns, especially in formulating laws and policies that provide equal landholding rights for both sexes. As a result, significant proportions of women smallholder farmers in Amhara regional state are entitled to own plots of land. This has helped to boost the position of women, enabling them to have a more equal standing with their husbands as landowners. Such achievements have positive implications in other important aspects of life, such as improving marital integrity and status, and reducing domestic violence. Those women farmers who are the heads of households have plots of land that they can manage by themselves. These provisions have helped women to secure their livelihoods and improve their participation in economic, social and political arenas.

However, these legal provisions and achievements are not without challenges. Different administrative and sociocultural issues have hampered women farmers' capacities and precluded them from fully benefiting from their legal rights and from the fruits of landholdings. Cultural norms concerning division of labour undermine changes in gender relations.

The education system should be scrutinized critically and redirected to bring transformative attitudinal changes in current and future generations, educating and shaping children from an early age, sensitizing family and the community to transform the existing gender-based division of labour. The education and awareness-creating programmes need to include different packages that can challenge and lead to changes in existing attitudes and practices.

Note

¹ The empirical findings of this chapter are extracted from the results of a large research project entitled *Assessment of the Rural Land Law Implementation in Amhara National Regional State*. This project tackled eight thematic issues. The author of this chapter was a member of the research team and primarily responsible for the theme of 'women and vulnerable groups'. The author acknowledges the USAID LAND Project for funding the research project, and the research team and other participants.

References

- Aboma, R. (2000) 'Gender and agricultural *production* among Maqi Oromo', Unpublished MA thesis, Department of Sociology and Social Anthropology, Addis Ababa University.
- African Women's Rights Newsletter (2010) 'Women's access to land and ownership of land: perspectives on law and practice in Africa', no. 3, Economic Commission for Africa, June.
- Almaz, W. (2007) 'Women's access to and control over land in the current land administration system in two rural "kebeles" in Ada'a "woreda" of Oromia Region', Unpublished MA thesis in Gender Studies, Addis Ababa University.

- Aluko, B and A. Amidu (2006) 'Women and land right reforms in Nigeria', Paper presented at the FIG 5th Regional Conference, Accra, 8–11 March 2006.
- Anaglo, J., S. Boateng and C. Boateng (2014) 'Gender and access to agricultural resources by smallholder farmers in the Upper West Region of Ghana', *Journal of Education and Practice*, 5(5): 13–19.
- Asrat Ayalew and Getnet Tadele (2014) 'Gender and farming in Ethiopia: an exploration of discourses and implications for policy and research', Working Paper 084, Future Agricultures.
- Asres Elias, E., M. Nohmi, K. Yasunobu and A. Ishida (2015) 'Does gender division of labor matter for the difference in access to agricultural extension services? A case study in North West Ethiopia', *Journal of Agricultural Sciences*, 7(1): 137–49.
- Berhanu Adenew and Fayera Abdi (2005) 'Land registration in Amhara Region, Ethiopia', Land Rights in Africa Research Report 3, London: International Institute for Environment and Development.
- Chornesky, A. (2000) 'The dynamics of battering revisited', *Affilia*, 15(4): 480–501.
- Duncan, D. (2013) 'This Ethiopian village has gained wealth, but has bred hostility', 12 December, www.pri.org/stories/2013-12-12/ethiopian-village-has-gained-wealth-has-bred-hostility.
- Eden Habtamu (2009) 'Zumra Nuru: his Awramba Community and his quest for utopia', www.ezega.com/News/NewsDetails.aspx?Page=news&NewsID=1472.
- FAO (Food and Agricultural Organization of the United Nations) (2011) 'The state of food and agriculture 2010–11: women in agriculture: closing the gender gap for development', Rome, www.fao.org/publications.sofa/en/.
- FDRE (Federal Democratic Republic of Ethiopia) (2012) *ZIKRE HIG of the Council of the Amhara National Regional State of Ethiopia in the FDRE: The Revised Amhara National Regional State Rural Land Administration and Use Proclamation*, Proclamation No, 133/2006.
- Flintan, F., D. Solomon, A. Mohammed, H. Zahara, B. Yemane and L. Honey (2008) 'Study on women in Afar and Oromiya Region, Ethiopia', USAID and Care.
- Frank, E. (1999) 'Gender, agricultural development and food security in Amhara, Ethiopia: the contested identity of women farmers in Ethiopia', Unpublished paper, USAID Ethiopia.
- Guardian (2014) 'Unlocking the power of women farmers', 12 June, www.theguardian.com/team-partner-zone/2015/may/12/smallholder-farmers-producers-agriculture-food-women.
- Hesse-Biber, S. N. and M. L. Yaiser (2004) *Feminist Perspectives on Social Research*, New York: Oxford University Press.
- Hirut, G. and R. Giovarelli (2013) 'The gender implication of joint titling in Ethiopia', Focus on Land in Africa Brief, Lesson 2, World Resource Institute and Landesa, February.
- Hoden, S. and T. Tewodros (2008) 'From being property of men to becoming equal owners? Early impacts of land registration and certification on women in southern Ethiopian', Final research report prepared for UN-HABITAT.
- Jonckheere, S., E. Musirimu and H. Liversage (2013) 'Legal empowerment to secure women's land rights in Burundi', Paper prepared for presentation at the Annual World Bank Conference on Land and Property, Washington, DC, 8–11 April.
- Kabeer, N. (2003) 'Gender mainstreaming in poverty eradication and the Millennium Development Goals: a handbook for policy-makers and other

- stakeholders', London: International Development Research Centre, Commonwealth Secretariat.
- Kumar, N. and A. R. Quisumbing (2014) 'Policy reform toward gender equality in Ethiopia: little by little the egg begins to walk', *World Development*, 67: 406–23, International Food Policy Research Institute (IFPRI).
- Mebrat Gebreslassie Gebru, M. G. (2011) 'Breaking the norms: gender and land rights in Tigray, Ethiopia', Unpublished MA thesis, Department of International Environment and Development Studies (Noragric), Norwegian University of Life Sciences.
- Mintewab, B. and S. Holden (2010) 'The role of land certification in reducing gender gaps in productivity in rural Ethiopia', Summary report, Discussion Paper Series10-23, Environment for Development (EfD), UN-HABITAT.
- Ogunela, Y. and A. Mukhtar (2009) 'Gender issues in agriculture and rural development in Nigeria: the role of women', *Humanities and Social Sciences Journal*, 4(1): 19–30.
- Oni, S., L. Maliwichi and O. S. Obadire (2010) 'Socio-economic factors affecting smallholder farming and household food security. A case of Thulamela local municipality in Vhembe District of Limpopo Province, South Africa', *African Journal of Agriculture and Food Security*, 1(5): 2289–99.
- Pallas, S. (2011) 'Women's land rights and women's empowerment: one and the same?', in C. Verschuur (ed.), *Du grain à modure. Genre, développement rural et alimentation*, Actes des Colloques Genre et Développement, Berne: DDC/Commission Nationale Suisse pour l'UNESCO.
- Paydar, N. (2012) 'Linking land rights to livelihoods: towards upholding women's property and inheritance rights in the developing world', Mini-conference paper, workshop in political theory and policy analysis, Indiana University.
- Rorisa, D. T. (2013) 'Rural women's access to land in Oromia Regional State of Ethiopia: access to rights or laws, which one counts more?', *International Journal of Innovative Social Sciences and Humanities Research*, 1(2): 65–76.
- Rwandan Women Network (RWN) (2011) 'Women's land right gains in Rwanda are eroded by cultural practices and negative attitude', Policy brief, May.
- Sisay, Y. (2008) 'Determinants of smallholder farmers' access to formal credit: the case of Metema, North Gondar, Ethiopia', Unpublished MSc thesis, Haramaya University.
- Yonas, T. Q. (2011) 'Women and land rights in rural Ethiopia: the case of Wolaita', Unpublished MA thesis, Faculty of Humanities, Social Science and Education, University of Tromsø.

8 | Rural transformation through robust land rights

Daniel Ambaye

Introduction

From time immemorial, land in Ethiopia had been controlled by the elite (kings and their trusted followers). Private ownership of land had never been known except for some historical exceptions. The Ethiopian people were subjugated for centuries by the inequitable land holdings in the country and only successfully removed the feudal system in 1975. The regime (Derg) that came to power in 1975 under the slogan ‘Land to the Tiller’ paradoxically subverted the motto and ended up in owning the land itself (state ownership) rather than giving it to the people. The current government, which came into power in 1991, was expected to cure the age-old land rights ills, among other measures by giving land to the people in ownership. Rather, it maintained the Derg’s stand of state ownership of land and controls all urban and rural land as well as natural resources.

Even though it is the state which controls landownership, rural farmers and pastoralists are guaranteed a lifetime ‘land holding’ right that grants all prerogatives except those of sale and mortgage. Although it is not mentioned in the constitution, urban residents are also provided with the right to acquire land for residence on a ninety-nine-year lease-based arrangement. The state ownership of land in present-day Ethiopia is far from perfect since it restricts the different land rights of use, rent, lease, donation and inheritance for different reasons. Since redistribution of land is highly restricted, access to rural land is also almost non-existent. The constitution is commended for its protection of land holdings against arbitrary state eviction through the insertion of a provision that gives a ‘commensurate’ amount of compensation during expropriation. Nevertheless, subsequently implemented proclamations have violated this protection by denying market value (fair compensation) for loss of property. In short, the amount of compensation in the event of expropriation is inadequate.

This chapter argues that in order for the present government to rectify the problems of equity and liberty in land use, and thereby to enable rural agricultural change, it has to do much by way of law revisions. By creating more access to rural land, liberating the land holding rights, and by fairly

compensating for loss of property during expropriation, the current government could grant more secure land rights compared to its predecessors and hence enable change in agrarian life.

The chapter uses a legal analysis of land rights in Ethiopia with a view to showing its relevance to sustainable development. It is based on a desk review of primary and secondary sources which have a direct relation to land tenure and rights. Primary sources such as legislation are employed for the analysis, principally the existing federal rural land administration and expropriation proclamations. Secondary sources such as books, articles, newspapers and government policy documents have been reviewed to gain additional insight into the system.

Historical overview

Imperial era As a result of the expansionist war of the ancient Ethiopian rulers with their neighbouring tribes, the state managed to incorporate vast territories within its rule. The land of the tribes was then put under the control of the monarchs and was usually redistributed to the favourites and supporters of the king in due course. In any event, the land remained under imperial control.¹ The land distributed to followers over time took the form of private *rist* (lineage usufructuary rights), Church land and government land. Land was granted to individual people/peasants in the form of *rist*. The peasants were then allowed to use, rent and bequeath the land to family members. In exchange, peasants were obliged to make different kinds of land-related tax payments.² Selling the land to non-family members was prohibited. Land was then transferred in the form of inheritance to children for generations, which over time reduced the size of farm lands.

Land was also provided to the Church, which was considered a major ally of the imperial power. The Church was a major possessor of material wealth, not only through selling salvation in return for treasure and land, but also by perpetuating imperial power over the people. It was the Church which played a major role in propagating the mass demanding obedience to the king. Obedience to the king was justified in many of the Christian writings and the day-to-day teachings. Monarchs who disagreed with the Church or fell out of favour found themselves in the middle of bloody wars.³

Land owned by the government was distributed to different people on the condition that they served the state at different levels. In other words, land during this era was used as a means to run state functions. Since gold and silver was not found in abundance (Gebre-Wold 1962), the government relied heavily on the land under its control to run the state (Shiferaw 1995). This was done in two ways: by giving land in lieu of salary to those who directly served the state and by collecting tax tributes in kind from those who farmed the land. Land given in lieu of salary might revert to the state in the event of

non-fulfilment of obligations by the holder of the land. For example, land was given to civil servants and war veterans (*maderia* land) in lieu of salary or pension for their services to the state as long as they continued their services. Land was also distributed to other state servants. Generally, it was known as *ginde bel* land. For example, land given to soldiers and military functionaries, and to people who served the palace as masons, prison guards, gardeners and so on, was thus categorized. In a similar fashion, the Church had also been distributing the land given to it for its support to the kings to different hierarchies of the clergy and laymen who served the church and protected its interests at the royal court (*Samon* land) (Mahteme-Sellassie 1970; Pankhurst 1966; Shiferaw 1995).

During the second half of the nineteenth century, the Ethiopian empire was further expanded to the present south, south-eastern and south-western parts of the country.⁴ The emperor (Menelek II) and his military commanders crushed any resistance attempted by the natives and confiscated all the lands of the natives (Pankhurst 1966). In places where the native chiefs accepted the dominance of the Ethiopian empire, the people were allowed to keep their lands intact (*ibid.*). In any event, a vast territory was again added to the Ethiopian empire during this period. All the land which was confiscated by the northern forces was distributed to different constituents. One part was given to Menelek's soldiers to settle on and as a reward for their loyal service during the expansion process; a second part was given to the local chiefs/gentry to maintain their support; a third part was given to the Church and would be distributed to the clergy in the same fashion as in the north; and another share, held by the state, was to be distributed to different people on the condition that they served the state at different levels. Northern people were encouraged to settle in the south in the hope that they, together with the existing soldiers, would enhance effective control of the new territories. As a result of this military expansion, all the native people who used to cultivate the land on a community and clan base were left landless, *gabbars*. The *gabbars* of the south hence literally became servants and tenants of the north until the 1974 Ethiopian revolution (Pankhurst 1966; Crummey 2000; Markakis 2006).

The peculiar feature of the land-holding right in the southern regions was that land was held in private ownership and hence subject to sale and other forms of exchange. There were prolific land sale transactions during this period, as investors were interested in cash-crop (mainly coffee) production by purchasing land from owners. But the land sale process left the southern *gabbars* as tenants who relied solely on sharecropping farming activities.

In the following decades (during Emperor Haile Selassie's era) the government tried to reduce the burdens of the southern *gabbars* by introducing different land-related laws, but to no avail; the landlords in the south became more powerful. At the same time the government introduced new tax bases on agriculture and

then later sold more lands to coffee-growing investors, both of which measures exacerbated the lives of the *gabbars*. The land tax reform also triggered peasant rebellions in the northern and southern parts of the country (Gebru 1977). In short, the government could not make any meaningful land reform before 1974 for two main reasons: one, the emperor (Haile Selassie) himself and his family, together with the nobility and lords in both houses of parliament, were owners of vast tracts of land, and any land reform would mean harming their interests; second, because of a lack of information on its advantages, peasants of the northern provinces opposed any attempt at land measurement and registration. Finally, peasant rebellions, popular unrest and most of all student movements which rallied on the famous slogan ‘Land to the Tiller’ became reasons for the downfall of the feudo-capitalist state in the country.

Derg era After the 1974/75 revolution, a military junta (aka Derg) took power and ousted the emperor from his throne. The Derg immediately passed a proclamation that nationalized all rural land and transferred the same to state ownership. This proclamation (Proclamation No. 31/1975) abolished overnight the age-old property system and left the landowners empty handed without any compensation. On the other hand, it allowed all the peasants and tenants to maintain and hold the land which they farmed and absolved them from any debt or obligation they owed to the landlords. The law restricted the right to use the land by prohibiting the lease/rent, donation, sale, exchange, mortgage and inheritance (except to minor children) of the land. In retrospect, the land reform was successful in that it generated a lot of support, especially from the peasants of the southern regions. The administration of land was given to the peasant associations created in every village of 800 hectares of land. They were tasked with, among other things, the distribution of land.

Next, the Derg enacted a proclamation (Proclamation No. 47/1975) that nationalized all urban land and extra houses (houses other than those occupied by the family for residential purposes). It denied any compensation for the loss of land in urban areas. Like its rural counterpart, this allowed all tenants (lessees) to maintain and use the houses they rented from landlords and freed them from any rent obligations or debts. The state replaced individual landlords in collecting rents. The law allowed a person to own only a single residential house and if necessary another single business house. As a result of this blockage in owning and renting houses, in the years that followed a significant housing shortage was experienced (Feyera and Tereffe 2010). The administration of urban houses was given to *kebeles* (sub-districts) and the Ministry of Housing based on the value of the houses.

Urban dwellers, of course, had ownership rights to the house they built and thereby were able to sell or transfer this to third persons. But the land had no value for them, and it was not subject to sale or any other means of exchange.

Although rural farmers were in a better position in terms of production process decisions (deciding what to produce on the land), later erroneous policies and repeated land reforms allowed them to benefit only marginally (Dessalegn 1993). The government, as owner of the land, conducted repeated land distributions and as a result farmers lost tenure security. Government had also introduced forced villagization (putting all rural farmers in one spot irrespective of their resistance), forced resettlement programmes (moving farmers from drought-prone regions, mostly the north, to other naturally endowed areas, mostly the south), and grain requisition programmes (forcing farmers to deliver all their produce to the government at a cheaper fixed price instead of selling it at market price). In conclusion, as Dessalegn (1993) observed, the history of Ethiopia during the Derg regime was partly a history of growing rural poverty, food shortages, famine and escalating rural insurgency and civil war.

Land rights in present-day Ethiopia

Land policy: two debates on ownership of land Immediately after the revolution and the assumption of power by the Derg and the subsequent land reforms it conducted, various insurgent groups took arms against the Derg. The current incumbent, the EPRDF (Ethiopian People's Revolutionary Democratic Front), won the war and replaced the Derg in 1991.

After the downfall of the Derg in May 1991, the new transitional government disbanded all collectivization and villagization programmes based on the consent of the people. Collective farms were privatized to individual farmers and the government stopped the grain requisition programme, allowing peasants to sell their produce at market value. In December 1992, the government adopted a new economic policy whereby it declared that until a new constitution was in place, land would remain under state ownership.

Based on the process of 'post-socialist transition' that had been carried out by the transitional government, and above all the type of free market economy that it embraced, many hoped that the new constitution would allow private ownership of land. However, when Proclamation No. 1/1995 was finally issued in 1995, it declared that all rural and urban land would remain in public ownership. According to the Federal Democratic Republic of Ethiopia's constitution (hereafter cited as FDRE constitution), all urban and rural land is the property of the state and the Ethiopian people (Article 40.3 of the FDRE constitution). Accordingly, sale, exchange and mortgage of land are prohibited. As Samuel (2006) noted, 'by inserting the land policy in the constitution, the current government has effectively eliminated the possibility of flexible application of policy'.

In many countries landownership is not treated as a constitutional issue, but in Ethiopia, because of its socio-economic importance, landownership goes beyond being a mere policy matter. Therefore, it features in the constitution and

is set in stone. The argument forwarded by the ruling party for the continuation of land as public/state property rests mainly on two policy objectives: social equity and tenure security. The FDRE constitution, as well as other federal and regional land proclamations, ensure free access to agricultural land. The amount of land to be provided to peasant farmers, as far as possible, is made equal. The policy objective is to ensure equality of citizens in accessing the land. The weakness of this policy objective is that since there is a lack of arable land in the highlands of the country, equality of access to land is ensured through transfer of land from large holders to small holders and/or to new landowners; the result being diminution of holding plots (0.5–1 hectares) as compared to other African countries. Social equality in Ethiopia is thus costly in that equality in privilege is tantamount to equality in poverty (Dessalegn 2009b). Yet most regional laws seem to restrict land distribution, which clashes with the policy objective of creating access to all.

Tenure security is another policy objective and concern of the government. As mentioned above, the FRDE constitution prohibits any sale or exchange of land. State ownership of land is considered the best way to protect the peasants against market forces. In particular, it has been argued that private ownership of rural land would lead to massive eviction or migration of the farming population, as poor farmers would be forced to sell their plots to unscrupulous urban speculators, particularly during periods of hardship (MOIPAD 2001). The justification is that for large-scale modern farms, there is abundant idle arable land in the lowlands; both for rain-fed and irrigation farming. On the other hand most farmers live in the highlands, where there is a scarcity of land but large amount of a accumulated human power owing to the high population density. Allowing farmers to sell land here would lead to their either being displaced or converted into tenants. Either way, large amounts of capital and labour will be wasted (*ibid.*). Critics argue, however, that the government's justification is just a hypothesis, not corroborated by evidence. Despite the government's concern, some researchers conclude that farmers would not sell their land wholly or partially if given the right to own their plots (EEA/EEPRI 2002). Another study, conducted by the World Bank, reveals that most farmers would rather rent their land during stressful periods compared to any other alternative, such as selling it (*ibid.*). In other words, in addition to other benefits of rental markets, the availability of formal land rental markets would enable farmers to withstand unfavourable circumstances by temporarily renting their land rather than selling it.

This land policy of the government has been attacked by researchers and international donors who favor neoliberal economic thinking. The usual argument forwarded by these people against the state/public ownership of land is one that focuses on lack of tenure security. They argue that absence of tenure security for land users provides little or no incentive to improve land

productivity through long-term investment; increases transaction costs because of land disputes, and hinders the emergence of property market features such as credit availability/ mortgages. The fear of the critics and supporters of private ownership of land is, further, that government may use land as a political weapon by giving it to and taking it away from holders. However, the government rejects such fears as groundless and claims that the system provides better security as it is managed by regional governments. A good example is the land registration and certification processes which are being conducted in Tigray, Amhara, Oromia and the southern regions, which enable farmers to acquire a land certificate for their holdings. This gives protection and security to the holder.

The current practice of land registration and certification provides tenure security, according to a study made by the World Bank (Deininger et al. 2007). Others, though, still do not have confidence in the land registration and certification process, concluding that the process has not engendered a feeling of tenure security. For example, Dessalegn (2009a) argued that since the land laws do not completely exclude the possibility of future land distribution, and since government still possesses the power to take land by way of expropriation, farmers cannot feel secure on their holdings. In general, the debates seem to be based on ideological differences rather than on empirical studies. The private versus state ownership of land in itself is not such a decisive factor. What is important is whether or not there are adequate measures and regulations in place to guarantee tenure security, such as land certification, just compensation in the event of expropriation, long duration of rights, good governance, absence of corruption, availability of courts, and so on. The following sections will highlight and discuss the rights provided to land holders and the protection accorded to the individual land holders.

Land-related legislation

PROCLAMATIONS Ethiopia is a federal state constituted of two special administrative cities (Addis Ababa and Dire Dawa) that are accountable to the federal government and nine other administrative national regional states which are autonomous in the administrative affairs of their people. The powers and functions of the federal and regional governments are defined in the FDRE constitution. The power to 'enact laws for the utilization and conservation of land and other natural resources, historical sites and objects' is provided under the constitution to the federal government (FDRE constitution Art. 51(5)). To this effect, the federal government enacted a 'Land Administration and Use Proclamation' in 1997 (Proc. 87/1997) and then replaced it with the current legislation, Proclamation No. 456/2005.

Proclamation 456/2005 delegates regional states with the power to 'enact rural land administration and land use law' which is consistent with it in

order to implement the land administration law at the regional level (Art. 17). In addition, there are other pieces of legislation in Ethiopia related to land matters, among which the Urban Land Lease Proclamation (Proc. 721/2011) and the Expropriation Proclamation (Proc. 455/2005) are the main ones. Further, most of the regional states (Tigray, Amhara, Afar, Oromia, Benishangul Gumz and SNNPRS) have adopted their own Rural Land Administration and Use proclamations and urban land holding lease regulations in order to implement the federal rural and urban land-related proclamations.

THE CONSTITUTION Article 40 of the FDRE constitution provides details about property rights in Ethiopia. When it comes to land proprietorship, Article 40(3) of the constitution answers the core question of the landownership issue in the following manner: ‘The right to ownership of rural and urban land, as well as of all natural resources, is exclusively vested in the State and in the peoples of Ethiopia. Land is a common property of the Nations, Nationalities and Peoples of Ethiopia and shall not be subject to sale or to other means of exchange.’

Regarding its means of acquisition, sub-article 4 states that Ethiopian peasants have the right to obtain land without payment and protection against eviction from their possession. Likewise, for the pastoralists of the lowland areas, sub-article 5 declares that Ethiopian pastoralists have the right to free land for grazing and cultivation as well as the right not to be displaced from their possession. Although the peasant is denied private ownership rights to the land itself, he is guaranteed a ‘full right to the immovable property he builds and to the permanent improvements he brings about on the land by his labour or capital. This right includes the right to alienate, to bequeath, and, where the right of use expires, to remove his property, transfer his title, or claim compensation for it’ (Article 40(7)). Thus, unlike in the Derg era, peasants now have full right to their produce and can sell it at market value. Moreover, the constitution guarantees peasants protection against arbitrary eviction from their land by the state. The constitution clearly states: ‘... the government may expropriate private property for public purposes subject to payment in advance of compensation commensurate to the value of the property’ (Art. 40(8)).

Concerning urban land, the constitution says nothing about the acquisition and transfer of land by urban dwellers. Nevertheless, some interpret the next sub-article, 40(6), which deals with right of investors to acquire land, as one that includes urban dwellers as well.⁵ Article 40(6) of the constitution envisages that private investors may acquire land on the basis of payment. In other words, unlike peasant farmers and pastoralists, investors must pay a reasonable fee for the land they get from the state. Literally, an investor is a person who uses the land for business activities and his main objective is to reap profit. So it is

obvious that urban dwellers cannot be categorized as investors. Noticing this problem, it seems, some regional constitutions replaced the word 'investor' with 'proprietor' (see, for example, ANRS constitution Art. 40(6)). The effect of such a change is that urban dwellers may be included in this definition, since the word proprietor may apply to any person who owns a property.

Rural land laws

Access to rural land Two years after the adoption of the FDRE constitution, the federal government enacted a Rural Land Administration and Use proclamation (Proc. 87/1997) that replaces the 1975 (Proclamation No. 31/1975) rural land law. Proclamation 87/1997 was again repealed and replaced by a new Rural Land Administration and Use Proclamation (RLAUP) (Proc. 456/2005) in 2005. This proclamation (hereafter called Federal RLAUP) follows the constitutional principle that creates free access to rural land. It declares that 'peasant farmers and pastoralists engaged in agriculture for a living shall be given rural land free of charge' (Art. 5.1). A person above the age of eighteen may claim land for agricultural activities. Women who want to engage in agriculture also have the right to acquire and use land (Art. 5.2).

This principle of free access to rural land has also been reproduced in the regional RLAUPs.⁶ The conditions attached to this right are, first, that the person must want to engage in agricultural activities. In other words, agriculture must be his/her main means of livelihood or profession. Secondly, s/he must reside in the area where the agricultural land is located. Although this principle is not clearly stated in the Federal RLAUP, regional RLAUPs have clearly embraced it.⁷ Thus, residency and profession are the two important conditions for acquiring rural land in Ethiopia. The rationale for this seems to be that since there is shortage of agricultural land in rural areas, because of population pressure, it is not advisable to give land to those who live elsewhere (absentee owners) and those who earn income from other professions.

The criticisms raised against this rule are that, first, the principle of free access to rural land has, in practice, not been working owing to shortage of land in rural areas and because the laws prohibit redistribution of land.⁸ Second, because of the residency requirement in the law, peasant farmers are locked in on their land and unable to search for additional income by staying in urban areas for longer periods. This in turn increases the pressure on agricultural land and exacerbates land fragmentation. The limitation in some regions⁹ is too strict in that farmers may not diversify their income by engaging in other non-agricultural activities which could otherwise help rural economic transformation.

Nature and duration of land rights Concerning the nature of the right provided to the farmers, the Federal and Regional Land Proclamations uphold

the constitutional principle that denies private ownership of land. Rather, these proclamations provide farmers with a right termed as ‘holding right’. The Federal Rural Land Law defines the term ‘holding right’ as the right of peasants and pastoralists ‘to use rural land for purposes of agriculture and natural resource development, lease and bequeath to members of his family or other lawful heirs, and includes the right to acquire property produced on his land thereon by his labour or capital and to sale, exchange and bequeath of same’ (Art. 2.4 of Proc. 456/2005). Similar definitions have also been included in the regional RLAUPs. The general understanding today is that peasant farmers have all the rights of an owner except those of sale and mortgage. Today there is even a move to include mortgage as an additional right of farmers in a newly revised law. Otherwise, under the existing RLAUP, farmers can use the land for agriculture production, have full ownership of the produce collected from it, have the right to rent or sharecrop to fellow farmers, lease to investors, and bequeath and donate (as a gift) to family members. Peasants shall have such a right for their lifetime and beyond, since they can donate and bequeath the land to others. It has been declared that the ‘... rural land use right of peasant farmers, semi-pastoralists and pastoralists shall have no time limit’ (see Proc. 456/2005, Art. 7.1; Art. 5.3 of Amhara RLAUP; Art. 8.2 of Tigray RLAU). In a way, this gives tenure security to the holder of the land as the right to use the land and the investments made thereon will not be threatened by time limitation. It must be noted that the longer the duration of rights of using land, the better in terms of ensuring tenure security.

The missing element in the Federal RLAUP is, however, the issue of pastoralist lands. The pastoralists are people who live in the lowlands of the country and depend on animal husbandry. They do not have a plot of land to settle on like the highland farmers; they are always on the move in search of pasture and water for their animals. The challenge is how to define their right to graze over vast territories of the lowlands as a holding right, a right that includes lease, rent and donation. The type of property regime dominating these areas is more of a communal than a private holding and governed by customary rules rather than formal laws. The remedy would be for the lowland regions to come up with their own rural land laws that take in to consideration the customary tenure system of the areas.

Modalities of land acquisition There are different ways through which a person may acquire rural land in Ethiopia. The law recognizes the following modalities for a person to acquire rural land:

LAND GRANT As mentioned above, the FDRE constitution and the subsequent land laws have created free access to rural land for those who wish to engage in agricultural activities. Any person aged eighteen and above has the right to

acquire rural land by government grant. The government, through its different land administration apparatuses, is empowered to give land to those who are in need of it. Land grant may be made from unoccupied government lands, communal lands, land reserve (land left without heirs and claimed back by government, land claimed back by the state because the holder leaves the area permanently or has neglected land), and finally by conducting land distribution. Land redistribution, as discussed above, has less appeal for land holders, who are supposed to give consent for its distribution.

INHERITANCE AND DONATION The second means of acquiring land is inheritance or donation. Any person who is a member of a peasant family has the right to acquire rural land from his/her family through inheritance or donation/gift (Art. 5.2 of Proc. 456/2005, Art.7 of Amhara RLAUP). A family member is defined as ‘any person who permanently lives with holder of holding right sharing the livelihood of the latter’ (Art. 2.5 of Proc. 456/2005). Unlike the Federal Revised Family Code (RFC), which recognizes family members as those who are related by marriage, blood and adoption, the Federal RLAUP follows a slightly different path. As can be inferred from the above-cited provision, a family member is one who ‘lives’ with the peasant who holds the land and ‘shares’ his ‘livelihood’. The requirements are basically twofold: residency and management, meaning that, first, s/he must permanently live with the farmer under the same roof (the residency element); and second, s/he must totally rely on the peasant farmer for his/her livelihood and have no other income of their own. S/he is under the control and administration of the farmer (the management element). This means that the law does not specifically require marital or blood relations for a person to be considered as family. Hence, a labourer who has no alternative income of his own and lives with the farmer without salary under the same roof may be considered as a family member and eligible for inheritance. Even the Amhara RLAUP goes one step farther by allowing inheritance of land by will to any farmer engaged in agriculture (Art. 16.1). By contrast, it is not possible to bequeath or donate rural land to one’s own children who live elsewhere or are engaged in other professions. The rationale behind such a rule seems to be that since land belongs to the state and the people and is not a private good, it has to be transferred to those who are in need of it, irrespective of their blood relations. However, the inclusion of ‘family members’ in the inheritance system is well accepted by the heirs and the people, as different studies show.¹⁰

SMALL-SCALE LAND RENTAL AND LEASE As already mentioned above, land rights could be transferred permanently through inheritance and donation. Besides this, there are other modalities through which land use rights may be transferred temporarily to others. We can call them commercial land

transactions to differentiate them from inheritance and gift. To be specific, the law recognizes rent (from farmer to farmer) and lease (from government to investor) as the two possible ways to transfer land use rights temporarily. Sharecropping is also a main means of land rental. Sale and mortgage are not yet allowed. The Federal RLAUP includes a general provision that allows rent and lease, the details of which are to be decided by regional rural land laws. It generally says that peasants and pastoralists can ‘lease to other farmers or investors land from their holding of a size sufficient for the intended development *in a manner that shall not displace them*, for a period of time *to be determined by rural land administration laws of regions* based on particular local conditions [emphasis added]’ (Art. 8(1) of Proc. 456/2005). This means that the law gives discretion in determining the duration of the lease period and the amount of land to be leased out to regional governments. However, one point which is clear is that farmland in its entirety may not be rented out as that is supposed to be a reason for displacement. Another point is that the law uses only the term ‘lease’, and excludes the word ‘rent’, whereas regional land laws give different meanings to the two terms.¹¹

While the FDRE RLAUP No. 456/2005 provides regional states with discretionary powers, Regional RLAUPs do not follow a similar approach in terms of the size of land to be leased out and the duration of the lease period. For instance, in Tigray the peasant is allowed to rent out up to 50 per cent of his land for twenty years if the lessee uses modern technology, and three years if s/he uses traditional means of production (Art. 9(1), (4) of Tigray RLAUP). In Amhara, renting land is allowed for a maximum of twenty-five years, although size is not mentioned. There are examples in the region where farmers have rented out the whole of their holdings to small-scale investors. The argument for deviating from the federal practice (*in a manner that shall not displace them*) depends on recognizing the rationality of the farmers; that farmers know what is best for themselves. The Oromia Land Law follows the Tigray approach in terms of size and duration. The SNNPRS Rural Land Law follows a somewhat different approach. According to Article 8(1) of Proclamation No. 110/2007, the duration of land rent from peasant to peasant is five years, from peasant to investor ten years, and from peasant to those who cultivate perennial crops up to twenty-five years (see the details in Table 8.1).

Investors who rent land either from the government or peasant farmers have the right to mortgage their lease right as security to banks (Art. 8(4) of Proc. 456/2005). What is being mortgaged here is not the land itself but the lease right, the right to use the land for a given period of time. This implies that an investor may lease land from two sources: first, from individual farmers, and second, from the government. When we look at the practices, it is the land which is rented from the government that is given as collateral to banks and

not that rented from peasant farmers. The reasons are, first, the land rented from peasants is too small to mortgage, and second, the peasant may not agree that his/her land should to be given as collateral to banks.

LARGE-SCALE AGRICULTURAL LAND LEASE The Federal RLAUP (456/2005) under Article 5(4a) allows investors to acquire rural land for agricultural investment: 'Private investors that engage in agricultural development activities shall have the right to use rural land in accordance with the investment policies and laws at federal and regional levels.'

This same principle has been reproduced in all the regional rural land laws promulgated so far. The logic behind this provision is to attract investors who have the capital and technology to participate in agricultural production on land found in the lowland areas of the country. About sixty million hectares of arable land lie idle in the lowlands of the country, on the border with Sudan. Because of their hostile environment, however, peasants from the highland areas have not been interested in cultivating the lowland areas. Taking this fact into consideration, the federal government has offered tax holidays and other incentives to attract domestic and foreign investors. An incredible number of domestic and foreign investors have shown interest and acquired land accordingly. It has been claimed that up to 2010 about 3.5 million hectares of land was transferred to both type of investor, and the government has a plan to transfer the same amount of land in the next five years (Dessalegn 2011), although the government has put the figure at about 2.6 million hectares (2.2 million given by regional states and 400,000 given by the federal government). Because of the large-scale land acquisitions secured by international and domestic investors taking place in Ethiopia and other developing countries, critics and foreign media talk of 'land grab'.

Initially the procedure of land transfer was left to the concerned regional states. But this was later changed for two reasons: first, regional states were inefficient in providing land; and second, they lacked the necessary technical capacity in designating and transferring the necessary land. It is said, for example, that the western region of Gambella had transferred 100,000 hectares of land to the Indian company Karuturi for less than two US dollars a hectare and for a period of seventy years. To alleviate such problems, the federal government has enacted a directive which enables it to take control of all uncultivated land greater than 5,000 hectares in all regional states. This directive, adopted by the Council of Ministers in February 2010, empowers the Federal Ministry of Agriculture (MoA) to identify and transfer agricultural lands greater than 5,000 hectares upon the consent of the regions. In other words, regional states retain the right to give land for agricultural lease below this amount. Accordingly, the MoA identified and transferred to its land bank about 3.6 million hectares from four regions (Dessalegn 2011).

	Federal	Tigray	Amhara	Oromia	SNNPRS	Benishangul Gumz
Rent Farmer-farmer	<ul style="list-style-type: none"> Amount should not be entire holding Period not mentioned 	<ul style="list-style-type: none"> 50% of land 3 yrs traditional 20 yrs modern 	<ul style="list-style-type: none"> No specific amount 25 years 	<ul style="list-style-type: none"> 50% 3 years traditional 15 modern 	<ul style="list-style-type: none"> No specific amount 5 yrs farmer-farmer 10, 25 yrs farmer-investor 	<ul style="list-style-type: none"> 50% of holding 2 yrs traditional 10 yrs modern
Lease Govt-investor	Amount not specified	50 yrs for agri investment	25 years	No mention	No mention	40 years subject to renewal every 5 yrs
Mortgage of investment lease right	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed
Mortgage of private holdings	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed
Donation	Allowed	-	To any farmer	To family members	To family members	To any person
Inheritance	Family members	<ul style="list-style-type: none"> Children Parents Dependants (with no land) 	<ul style="list-style-type: none"> To any farmer by will Minor children Children with no land Children with land Parents 	To family members (includes dependants)	To family members	<ul style="list-style-type: none"> To any farmer by will Minor children Children with no land Children with land Parents

Table 8.1 Rural land rights in the federal and different national regional states
Source: Federal and State Rural Land Use and Administration proclamations

The MoA has come up with figures that deal with the amount of rent, the lease period and the amount of land to be transferred. For instance, the maximum amount of land to be transferred is set at 50,000, 20,000 and 5,000 hectares for biofuel, cereals and tea/coffee production respectively. Some critics, however, claim that the government does not strictly enforce its own rules. In reality, regional states still do not abide by the amount of rent adopted by the federal government. Further, regions complain about the lack of institutional coordination between the MoA and concerned regions during provision of land and the subsequent follow-up of investment projects. For example, it is not clear who should consider the environmental and social impacts of a project, who receives income tax and the lease instalment payments, and so on.

Today the federal government is entertaining the idea of returning responsibility to the regions so that the latter would be fully responsible and accountable for the administration and transfer of their land. The system is also marred with corruption as many investors are said to be borrowing large amounts of money from the state Development Bank (DBE) with little result on the ground. A study by the prime minister's office also shows that there results do not match expectations. Many investors, including the infamous Karuturi, lost their land as they could not deliver results as per their contracts. Hence, the conclusion is that the contribution of this sector in transforming rural livelihoods seems unpromising.

Expropriation

Expropriation is forced taking of land by the government for public-purpose activities against payment of a fair amount of compensation. The author has dealt in detail elsewhere with the nature and procedure of expropriation and the valuation and compensation systems followed today in Ethiopia (Daniel 2009), and here we shall consider it only from the land rights perspective.

The FDRE constitution guarantees peasants and pastoralists their holdings against arbitrary state eviction by introducing the principle of expropriation – that in the event of seizure of land for public-purpose activities, holders of land shall be compensated fairly. It specifically prescribes that a ‘commensurate’ amount of compensation should be paid in the event of expropriation of private property (Art. 40.8 of FDRE constitution). From Private property is understood in the constitution as all fixtures and improvements made on the land, but not the land itself (Arts 40.1, 40.3). This means the loss of the land is not compensable.

Today, whether in urban or rural areas of Ethiopia, a huge amount of land is being expropriated for urban redevelopment, urban expansion, road and railway construction, industrial parks and other public activities. The valuation method adopted in the expropriation proclamation (Proclamation No. 455/2005) implements the constitutional principle of payment of a

Period	Rural/ Urban	N/S	Use	Lease	Donate	Inherit	Mortgage	Sale	Equity
Imperial era	Rural	North	✓	✓	✓	✓	X	X	✓
		South	✓	✓	✓	✓	✓	✓	X
Derg era	Rural		✓	X	X	X (✓)	X	X	✓
Current system	Rural		✓	✓	✓	✓	X	X	✓

X (✓) No inheritance except for minor children and a widow

Table 8.2 Summary of land rights in three periods of Ethiopian history

‘commensurate’ amount. In urban areas, location has no value and owners are being compensated only the ‘replacement cost’ of buildings; government reaps the location value that was developed and grew at the expense of the land holder/dweller. In rural areas, the compensation provided for the loss of agricultural land is equivalent to the value of ten years of crop production. It is calculated by taking the average value of produce over the past five years and then multiplying it by ten. The usual criticism of the practice is that compensation is not adequate; does not reflect the market value at all; and does not follow the constitutional guarantee providing for land rights – that is, the equal ownership of land by the state and the people.

Conclusion

This chapter describes the land rights that exist in present-day Ethiopia with a brief introduction describing past tenure systems. In feudalistic Ethiopia (before 1974), land had been controlled by the elite, in that although peasants in northern Ethiopia were allowed to have usufructuary right (*rist*) on their land, they were encumbered with different obligations. The peasants in the southern part of the country, on the other hand, were evicted from their land during the nineteenth century and became landless *gabbars*, servants to the northern settlers who took their land. The Derg, which replaced the imperial regime, came to power adopting the well-known slogan ‘Land to the Tiller’ with the objective of distributing land to the farmer and thereby making him/her the owner of the land and any produce therefrom. However, the first thing the Derg did was nationalize all urban and rural lands and extra houses in urban areas, without payment of compensation. The government replaced the previous landlordism in all its forms as it became the sole renter and rent collector. The rural and urban land laws completely prohibited sale, mortgage, lease/rent, donation and inheritance (except by spouse and children) of land.

In spite of this, the measure at first received great support from the rural peasantry, especially in the southern regions of the country. However, because of the erroneous policies of the government that followed and repeated land distribution activities taking place, the motto 'Land to the Tiller' was dropped.

In 1991, the Derg, a Marxist government, was toppled and a transitional government was established until the adoption of the current constitution in 1995. The new constitution amends the landownership of the Derg by putting ownership of the land in the hands of the public and state. Currently, there are other pieces of land-related legislations in the country dealing with urban and rural lands and natural resources. According to the federal constitution, all urban and rural lands and natural resources belong to the state and the public.

The rural land laws provide peasants with lifetime rights (the holding right) to the land. This land right includes use, lease/rent, donation and inheritance rights. Sale, exchange (barter) and mortgage are not allowed. The rights of lease/rent, donation and inheritance are, however, restricted for different reasons. The rural land laws also create (at least in principle) free access to rural land, although, because of land shortages and restrictions on land distribution, this right has not been realized. The inability of rural youth to access land creates a large youth population in rural areas, which exacerbates resource competition and fragmentation of land, inhibiting rapid economic development in rural areas. As farmers are forced to divide and transfer part of their land to their children, fragmentation of land increases and hence there is less productivity. Government is also forced to give common resources such as grazing and forest land to the youth, which accelerates their exhaustion and extinction.

Recommendations

Rural development and change cannot be attained without better and secured property rights. The government is doing good work in creating security of tenure, among others measures through registration of land and issuance of certificates. However, restricted land use rights contribute to tenure insecurity, a less efficient land market and poor transferability of land, as well as inaccessibility of credit for the rural masses. By improving the legal rights under the existing legal regime and broadening such land rights it would be possible to introduce more change in rural areas, which in turn would contribute to rural transformation. The land use rights in the country can be liberalized within the given constitutional arrangement (state and public ownership of land).

The following specific recommendations are made:

- Government should revise the rural land proclamations and ease some of the restrictions imposed, such as on rights to rent, donation and inheritance.
- The residence element for farmers is not necessary since it hampers peasants in searching alternative income by staying for longer periods in urban areas.

- Much care is needed in the event of land transfer for large-scale agricultural investment. Among other things, care should be taken on the amount of land transferred, the lease period and the effect it has on the environment.
- The rules of valuation and compensation during expropriation should be revised to make them fit with the constitution such that fair compensation is paid in the event of expropriation, creating an opportunity for rural farmers to share in the development and transformation witnessed in the country.

Notes

1 The concept of royal ownership of all land in Ethiopia was documented by the royal chroniclers of different kings. For example, upon the purchase of land by King Lalibela (1200–1250) to construct his well-known rock-hewn churches in Roha, his hagiographer asked rhetorically for a demonstration of the traditional power of the monarch in control of lands, ‘who would have forbidden the king had he decided to take the land [without purchase]’. In his famous conflict with the monastic leaders, Emperor Amda-Sion (1314–1344) is said to have demanded their absolute obedience to him because they lived ‘on the land of the king.’ His son and successor, Sayfe-Arad (1344–1372), is also said to have made the claim that ‘God gave [all the] land to me’.

2 The main ones were tribute (one fifth) and tithes (one tenth) of total produce and usually paid in kind.

3 Good examples are Emperor Susenyos (1606–1632) and Emperor Tewodros (1855–1868). Susenyos tried to change his faith from the official Orthodox Christianity to Catholicism and was excommunicated by the Church and forced to resign from power after a bloody civil war. Emperor Tewodros, who tried to reform the existing land tenure by taking massive Church lands, was met with firm resistance from the clergy and the nobility which led to his loss of legitimacy and gradual downfall. He committed suicide during his last war with the British, who were supported by the other nobles.

4 The expansion of the empire at that time remains a point of contention in today’s politics. While most northern people allege that the measure by Menelek was a reannexation of the territories as they were controlled before the coming of Ahmed Gragn (the leftist) between 1529 and 1543, followed by the Oromo migration, political elites of the southern territories, especially from the Oromo group, argue that it was a colonial move on the part of the empire to take the Oromo’s native land.

5 For example, this was the public position held by government officials during the enactment of the new urban land lease proclamation in 2011.

6 See, for example, the Revised Tigray National Regional State Rural Land Administration and Use Proclamation, Proclamation No. 239/2014. *Tigray Negarit Gazeta*, Year 21, No. 1, Art. 8(1); The Revised Amhara National Regional State Rural Land Administration and Use Proclamation, Proclamation No. 133/2006. *Zikre Hig*, Year 11, No. 18, Art. 5(2); Oromia Rural Land Use and Administration, Proclamation 130/2007, Art. 5(1); the Southern Nations, Nationalities and Peoples Regional State Rural Land Administration and Utilization Proclamation, Proclamation 110/2007. *Debub Negarit Gazeta*, Year 13, No. 10, Art. 5(1) (also called SNNRS) and the Benishangul Gumz National Regional State Rural Land Administration and Use Proclamation, Proclamation No. 80/2010.

7 See, for example, the Amhara National Regional State Rural Land Administration and Use Proclamation (hereafter called Amhara RLAUP), which uses the phrase ‘any person residing in the region ...’ as a condition for acquiring agricultural land (Art. 5(2), 6(1), 7(1)); the Tigray RLAUP uses similar wording: ‘any resident of the region’ (Art. 5(1)).

8 The Federal RLAUP simply says that upon the wish of the people land may be redistributed (Art. 9); the ANRS states that it may if 80 per cent of the people agree (Art. 8); the Oromia Rural Land Law completely prohibits redistribution (Art. 14).

9 For example, the rule in Tigray is that anyone who has left his land for whatever reason for more than two years (Arts 11.1, 13.1) or who starts getting more than a 1,000-birr income from other activities shall lose his right to the land. Similarly, in Amhara, if the farmer engages in other activities that bring him an amount equivalent to the minimum government salary or engages in a business for which tax is payable he shall lose his right (Art. 14.1 a–b of ANRS Regulation No. 51/2007).

10 The USAID-supported Land Administration to Nurture Development (LAND) programme has sponsored land law implementation in the four main regions and one of the commonly reported findings was that the people did not accept that strangers should be included as family members equally with children (unpublished studies conducted by universities for LAND).

11 For example, in the Amhara and Oromia Rural Land laws ‘rent’ is understood as ‘transfer of land to fellow farmers for [a] shorter period of time’, while ‘lease’ is ‘transfer of land from farmers to investors or from government to investors for a longer period of time’.

References

LEGISLATION

Amhara RLAU: the Revised Amhara National Regional State Rural Land

Administration and Use Proclamation, Proclamation No. 133/2006. *Zikre Hig*, Year 11, No. 18, Art. 5(2)

ANRS constitution

ANRS Regulation No. 51/2007

FDRE constitution

Tigray RLAU: the Revised Tigray

National Regional State Rural Land Administration and Use Proclamation, Proclamation No. 239/2014. *Tigray*

Negarit Gazeta, Year 21, No. 1, Art. 8(1)

Proclamation No. 1/1995. Constitution of the Federal Democratic Republic of Ethiopia. *Negarit Gazeta*, Year 1, No. 1.

Proc. 87/1997

Proclamation No. 455/2005. Expropriation of Land Holdings for Public Purpose and Payment of Compensation

Proclamation (2005). *Negarit Gazeta*, Year 11, No. 43

Proclamation No. 456/2005. Federal Democratic Republic of Ethiopia Rural Land Administration and Land Use Proclamation. *Negarit Gazeta*,

Year 11, No. 44

Proclamation No. 110/2007

Proclamation No. 47/1975. Government Ownership of Urban Land and Extra Houses. *Negarit Gazeta*, Year 34, No. 41

Proclamation No. 31/1975. Public Ownership of Rural Lands. *Negarit Gazeta*, Year 34, No. 26

Oromia Rural Land Use and Administration, Proclamation 130/2007, Art. 5(1)

The Southern Nations, Nationalities and Peoples Regional State Rural Land Administration and Utilization Proclamation, Proclamation 110/2007. *Debub Negarit Gazeta*, Year 13, No 10, Art. 5(1)

The Benishangul Gumz National Regional State Rural Land Administration and Use Proclamation, Proclamation No. 80/2010

BOOKS AND ARTICLES

Crummey, D. (2000) *Land and Society in the Christian Kingdom of Ethiopia: From the Thirteenth to the Twentieth Century*, University of Illinois Press.

- Daniel Ambaye (2009) 'Compensation during expropriation', in Muradu Abdo (ed.), *Land Law and Policy in Ethiopia since 1991: Continuities and Changes*, Addis Ababa: Ethiopian Business Law Series, Faculty of Law, Addis Ababa University.
- Deininger, K., A. Daniel, S. Holden and J. Zevenbergen (2007) 'Rural land certification in Ethiopia: process, initial impact, and implications for other African countries', World Bank Policy Research Working Paper 4218, World Bank.
- Dessalegn Rahmato (1993) 'Agrarian change and agrarian crisis: state and peasantry in post-revolution Ethiopia', *Africa: Journal of the International African Institute*, 63: 36–55.
- (2009a) 'Land registration and tenure security: a critical assessment', in Dessalegn Rahmato (ed.), *The Peasant and the State: Studies in Agrarian Change in Ethiopia 1950s–2000s*, Addis Ababa: Addis Ababa University Press.
- (2009b) 'An assessment on the Ethiopian agricultural policy', in Taye Assefa (ed.), *Digest of Ethiopian National Policies, Strategies and Programmes*, Addis Ababa: Forum for Social Studies and The European Union.
- (2011) 'Land to investors: large-scale land transfer in Ethiopia', FSS Policy Debate Series, Addis Ababa: Forum for Social Studies.
- EEA/EEPRI (2002) 'A research report on land tenure and agricultural development in Ethiopia', Addis Ababa: Ethiopian Economic Association/Ethiopian Economic Policy Research Institute.
- Feyera Abdissa and Terefe Degefa (2010) 'Urbanization and changing livelihoods: the case of farmers' displacement in the expansion of Addis Ababa', in *The Demographic Transition and Development in Africa*, pp 215–35.
- Gebre-Wold, I. (1962) 'Ethiopia's traditional system of land tenure and taxation', *Ethiopia Observer*, 5: 302–39.
- Gebru Tareke, G. (1977) 'Rural protest in Ethiopia, 1941–1970: a study of three rebellions', PhD thesis, Syracuse University.
- Mahteme-Sellassie, W. (1970) *Zekre Neger*, 2nd edn, Addis Ababa.
- Markakis, J. (2006) *Ethiopia: Anatomy of a Traditional Polity*, Addis Ababa: Shama Books.
- MOIPAD (2001) 'Federal Democratic Republic of Ethiopia rural development policies, strategies and instruments', Addis Ababa: Ministry of Information, Press and Audiovisual Department.
- Pankhurst, R. (1966) *State and Land in Ethiopian History*, Addis Ababa: Institute of Ethiopian Studies and the Faculty of Law, Haile Selassie I University.
- Samuel Gebreselassie, G. (2006) 'Land, land policy and smallholder agriculture in Ethiopia: options and scenarios', Discussion Paper 008, Future Agricultures Consortium meeting, Institute of Development Studies.
- Shiferaw, B. (1995) 'The evolution of land tenure in the imperial era', in B. Shiferaw (ed.), *An Economic History of Ethiopia: The Imperial Era 1941–1974*, Dakar: CODESRIA.

Concluding remarks

Atakilte Beyene

Ethiopia's smallholder agriculture has been the backbone of the country for centuries. Despite this, it has been marginalized and, more often than not, severely undermined by the very policies that targeted it. But, since the mid-1990s, Ethiopian smallholder farmers have entered the political discourse of the country in more positive and important ways. The economic policies of the country have given due attention to poverty reduction and the government argues that its political and economic priority is to reduce poverty and bring about economic prosperity. Since early 2000, extensive efforts have been made to improve rural infrastructure, and access to health, education and other social services. In its recent modern history, the country, for the first time, managed to implement such significant policies in a successive and complementary manner, and avoided radical policy changes that would have violently undermined preceding efforts. This has significant implications for the continuity, stability and gradual maturity of the policies.

As a non-resource-extractive country, Ethiopia is among the very few countries that have registered rapid and stable economic growth (real GDP growth averaged 9.7 per cent in 2004–16) (World Bank 2017). Poverty levels have declined from 79 per cent of the population living in poverty in 1995 to 34 per cent in 2015 (World Poverty Clock 2017). Since 2000, the political and economic vision of the government has been to situate the country among middle-income countries by 2025 (GoE 2011). The key promise enshrined in this is to bring structural change to all sectors of the economy.

The agricultural sector, especially the smallholder sector, is key. Issues of rural poverty reduction continue to be important. To address these, various mechanisms are used. The dominant one is to secure land for the majority of the rural population. For most households, having a piece of land is still the means of securing their livelihoods. Another approach is the Productive Safety Net programme, which is primarily implemented in agriculturally poor and food-insecure areas. Parallel to these, there are also efforts that aim at improving the agricultural production of smallholders.

The major approach to improving smallholder agriculture is the extensive extension system through which various support measures are carried out. Provision of technological packages of improved seeds, fertilizer and pesti-

cide constituted the core objective of the extension system. These approaches have helped to boost agricultural production outputs. Nevertheless, changes in agricultural productivity, levels of household vulnerability and proportion of labour employment in agriculture have not come about. There is policy recognition of the need to induce transformation in smallholder agriculture. The policy perspective is that smallholder agriculture should transit from subsistence-oriented agriculture towards an agriculture that fuels the development of industrialization, whereby farmers become more market-oriented (EATA 2016).

This book argues that smallholder agriculture has both internal and external issues that should be considered in discussions of transformation. Cultural values, rural health, gender relations and land and property rights are largely internal conditions that determine progress in agricultural change and transformation. Processes of land and farm consolidation and possibilities to accumulate and expand farms, which are crucial transformative processes, need to be seen in relation to the local and policy context of the rural area. Youth unemployment and underemployment in rural areas have increasingly become a major challenge for the country. Vulnerability of smallholder agriculture is still very high. The overwhelming dependency of smallholder agriculture on rainfall and vulnerability to impacts of climate change are major challenges to transformation.

The book highlights that transformation of smallholder agriculture needs to be conceived as a multifaceted mix of social, cultural, policy and economic processes and not just changes in production. The current policy emphasis on boosting agricultural production through the extensive extension system and agricultural input supply has enabled the country to register important success stories in improving livelihoods at the local level. But these efforts have not eradicated the cycle of rural poverty and many of rural people are still food insecure. To facilitate a broad-based agricultural transformation, agricultural strategies and policies should progressively widen conditions that lead to more diversity and greater specialization within the smallholder agricultural sector. In this regard, improving security of land rights, supporting long-term land transfer systems and land consolidation processes, and creating predictable and better markets for agricultural products, as well as building the necessary institutional and organizational conditions, are important aspects that need to be addressed.

The following are the key messages of the book:

ENCOURAGE NON-STATE ACTORS IN AGRICULTURAL INPUT AND OUTPUT SERVICE PROVISION: The role of government in the provision of services, such as extension services, has been indispensable and it is likely to be so for the foreseeable future. Nevertheless, the procurement and delivery systems suffer

from lack of competitiveness, sustainability and reliability. Ensuing effective and competitive systems of delivery is a crucial condition of the transformation process. As addressed in Chapter 1, inefficiencies in the systems are major bottlenecks in Ethiopia. The major factor in this is the domination of the public sector in procurement and delivery of agricultural inputs, while the role of the private sector has been undermined. Attempts by the private sector to get involved in the provision of services has been problematic due to institutional, capacity and market reasons.

As an alternative, the role of farmers' cooperatives has increasingly become important, which is positive. In order to compensate for the more individualistic and disaggregated management of resources, farmers' cooperatives are well positioned to manage large-scale agricultural projects. However, farmer cooperatives face challenges as well. Human resource capacity development (on management), financial constraints and institutional and legal support systems need to be continuously assessed.

SHIFT POLICY FOCUS FROM PRODUCTION TO INCOME AND VALUE-ENHANCING MEASURES: The policy approach to smallholder agriculture is focused on improving agricultural production. This is mainly because rural poverty and food security issues are framed as matters of agricultural production. The post-harvest aspect of the agricultural system has not been equally treated. Expansion of affordable means that reduce loss of harvest, including storage facilities, is essential. These challenges are prominent in irrigation agriculture, where perishable products are produced. As Chapter 3 indicates, while the construction of irrigation schemes has created beneficial conditions for farmers, lack of market and reasonable income is the major problem. To address this problem, policies must create financial and institutional incentives. A good example is the Ethiopian Commodity Exchange, which is designed to provide producers with market prices in real time. Financial credit facilities have been set up for traders in order to facilitate transactions. This has greatly reduced transaction costs and has enhanced income for producers. Unfortunately, few crops, mainly export cash crops like coffee, are included in this system. The majority of smallholder farmers do not have access to such a system.

LARGE-SCALE AGRICULTURAL INVESTMENTS AND EXPORT-LED AGRICULTURE: The Ethiopian government has embraced large-scale and export-led land investments by the private sector. It has crafted various policy and economic incentives for the sector. However, whether and how smallholder agriculture will be engaged is poorly articulated. The evidence so far confirms that despite the expected benefits and advantages, large-scale farms, especially those engaged in producing food crops, have not been able to deliver. Employment generation and inclusion of farmers in their production and/or marketing schemes have

been very poor. But companies that rely on products produced by smallholder farmers could potentially be advantageous in terms of the market and added value they create for smallholders. As explored in Chapter 2, the viability of such contractual arrangements depends on whether they include provision of high-quality agricultural inputs to farmers. Farmers who received improved high-quality seeds, fertilizer and extension services were able to cover such costs and deliver quality products to the contracting company.

Therefore, to realize potentials and opportunities, participation of smallholder farmers in the emerging private investment in agriculture needs to be much more focused and selective. Public policies and incentives should clearly prioritize and support investments that add value to the products of smallholder farmers.

CEREAL CROPS AND THE DOMESTIC MARKET: Cereal production systems, which are a characteristic feature of smallholder agriculture, have important structural implications; namely, the potential demand for the products is relatively small and too weak for it to become a major driver of change. Cereals are predominantly domestic consumer products. Much of the produce is already consumed by the producers themselves and the volume put into the market is small. This is not by coincidence. The urban population, which is the major consumer of the marketable products, is small (20 per cent). Furthermore, not all urban population income is high enough to propel higher prices for food products. This is a major structural challenge facing the transformation agenda. As Chapters 1, 2 and 3 indicate, whenever there are profitable markets, smallholders can quickly adapt their production. The case of vegetable production is an example. Following the market signals, farmers who used irrigation were able to increase their production. But the market soon became saturated and prices diminished. This suggests that the prospect of smallholder agricultural transformation is structurally constrained by the type of the products produced (consumer products) and the potentially limited market and demand for such products (both volume and price). The potential way out of this trap depends on 1) expansion of urbanization as well as growth of income in urban areas; 2) whether smallholders shift agricultural products from food to high-income (cash or industrial) crops; 3) access to high-value markets; and 4) whether farmers are able to eventually secure income that allows accumulation and consolidation of their farm activities.

CULTURAL VALUE SYSTEMS AND RURAL HEALTH ISSUES: The policy perspective on transformation is framed around the production-innovation aspects of farming activities. However, agriculture is also about social and cultural value systems. Issues of identity, cultural values and symbolic attachments to farm and farm products are important dimensions revealing the multidimensionality

and complexity of change processes. As Chapter 5 explains, deeply embedded perceptions and customs are likely to influence farmers' decisions on farming practices. Thus, discussions about transformation need to consider such cultural and value systems. Often, local value systems are seen as constraining changes in agronomic practices that are conceived as good by development agents. On the other hand, local value systems may signify local food specialities and identity, hugely significant to preserving the food system. These are crucial elements to counter corporate and industrial food chains and supermarkets, which pose a threat to local food systems, such as by competing for access to markets.

Like value and cultural systems, rural health issues need to be considered as part and parcel of the agricultural transformation agenda. As Chapter 6 elaborates, the vulnerability of rural households to diseases has significant impacts on agriculture. Dramatic changes in health status, such as disease outbreaks, have devastated rural populations and their agricultural system. Illness of members of households is the major shock that smallholders face. Therefore, improving access to non-agricultural social services, such as health, is crucial.

Smallholder farmers also have internal limitations that undermine positive changes. As Chapter 7 indicates, the social and cultural systems that frame gender relations affect every practice in agriculture. The significance of these is fully appreciated when the local struggle to access and use resources is seen in light of the prevalent power relations largely defined by cultural norms that reinforce inequality. An interesting observation that came out of the study concerns the multiple ways in which cultural norms try to maintain the status quo. The case in point is that, while Ethiopia's policy measures to legalize and formalize equitable access to land and household resources are commendable, the proportion of women-headed households in the poverty trap is very high. This suggests that gender inequality is still a problem. Therefore, the agricultural transformation agenda needs to recognize and address problems of gender and other social relations issues that constrain different social groups.

SECURITY OF LAND RIGHTS, LAND TRANSFER AND THE PROCESS OF LAND CONSOLIDATION: The issue in Ethiopia's land tenure today is not primarily one of equity, as land is equitably distributed among households. But improving security of land rights and, thereby, enabling alternative land transfer mechanisms are. These constraints have multiple implications. As described in Chapter 8, they tend to 'lock' land within the households that hold it. Long-term or complete transfer of land is constrained not only by the fact that pressure on land is high, but also by the fact that the land policy constrains such processes. With the exception of mortgaging to siblings, farmers cannot completely transfer land among themselves. Relaxing the constraints could

have the following potential positive effects. First, the efficiency of land might improve. Long-term or complete transfer of land is likely to trigger the process of transfer of land from less to more efficient users. Secondly, if the rural youth is going to play productive role in the agricultural sector, access to land, on a reasonable timescale, is necessary. Thus, allowing long-term land transfer could be a good incentive to engage the youth in agriculture. Third, complete transfer of land could lead to a land consolidation process among farmers, with more efficient farmers obtaining land from less efficient producers, generating higher marginal value for the efficient producers. These are crucial processes needed to induce a structural change process among smallholder farmers.

Enticed by the global and national demands for food, feed and fibre, agricultural investment is beginning to flow into Ethiopia. Unprecedented transfer and acquisitions of arable land and water resources by a variety of investors, including sovereign states, private and domestic investors, and public enterprises, have taken place recently. The emergence and growing role of new stakeholders in Ethiopia's agriculture are leading to new interests and dynamics. An important trend observed is that the role of the state is changing as it strives to accommodate the emerging interests. Policies that undervalue land to attract investments may reinforce inequality in societies. Expropriation of land resources from local people, and the compensation provided to them by the governments, in a context where there are no proper land markets, have become major social and political issues.

References

- EATA (Ethiopian Agricultural Transformation Agency) (2016) 'Agricultural transformation agenda, Annual Report 2015–16', Addis Ababa: Ethiopian Agricultural Transformation Agency.
- GoE (Government of Ethiopia) (2011) 'Growth and Transformation Plan 1', Addis Ababa: Federal Democratic Republic of Ethiopia.
- World Bank (2017) 'Global economic prospects, June 2017: a fragile recovery', Washington, DC: World Bank, openknowledge.worldbank.org/handle/10986/26800. Licence: CC BY 3.0 IGO.
- World Poverty Clock (2017) www.worldpoverty.io/index.html.

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