

INTRODUCTION

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Ethiopia is one of the most populous countries in Africa with the agricultural sector playing an important role in the country. It is estimated that in 2011 the agricultural sector contributed about 45 percent to gross domestic product (GDP). More important, it is a major source of employment in the country, with almost 80 percent of the population making a livelihood in the sector (World Bank 2014a). Understanding the complex linkages in agriculture, and identifying opportunities and challenges to improve its performance, is therefore fundamental. Moreover, while Ethiopia has made important strides in the reduction of poverty and the improvement of food security over the past decades, poverty and food insecurity levels remain high. At the forefront, government policies and stakeholders have made enormous efforts to improve the functioning of the agricultural sector and of staple food sectors in particular, along with attempts to understand what policies and investments are likely to have the most impact.

However, given the heterogeneous nature of agriculture and its spatial spread over very diverse agroecological regions, there is often a dearth of updated and representative evidence and analysis on the agricultural sector. In addition, appropriate and updated information on the functioning of food and agricultural value chains is often insufficient for policy makers and other stakeholders to make informed decisions. Given that different crops within the agricultural sector often have specific characteristics related to soils, temperature, moisture, labor, harvest and postharvest management, marketing, and preferences by consumers, analysis at the crop level to assist policy making is often considered the most relevant level. This has therefore given a boost to the analysis of crop value chains, internationally as well as in Ethiopia, to improve decisions on investments and policies. In an effort to contribute to better knowledge, which has developed from evidence-based improvements of the agricultural sector in the country, this book in particular focuses on

the most grown staple food and most important cash crop in Ethiopia: teff (*Eragrostis tef*).¹

Compared with other cereals, teff is hardy and able to withstand adverse weather conditions and is therefore considered a lower risk crop (Fufa et al. 2011). Teff is mostly grown at middle elevations between 1,800 and 2,200 meters above sea level and in regions where there is adequate rainfall. These characteristics, together with it being easy to store, seemingly explain the sustained importance of teff in the country. Its grain is mainly used for making injera, a spongy flatbread, Ethiopia's (and Eritrea's) main national dish. Teff is also valued for its fine straw, which is used for animal feed as well as for other purposes, such as mixing with mud for building.

By any standards, teff is an important crop, for farm income as well as food security in Ethiopia. It counts for 22 percent of the cultivated area; and in 2013/2014 it was estimated that about 6.6 million smallholders were involved in the production of teff—that is, 43 percent of all farmers in the country (Chapter 2). On the consumption side, teff makes up as much as 12 percent of all food expenditures and is therefore for consumers the leading food crop in their consumption basket. Teff is the most important cash crop in the country, and it contributes considerably to income generation for a large number of agricultural producers. Moreover, the production is mostly in the hands of poor smallholders whose livelihoods are likely to have significantly changed with the important changes seen recently in teff supply chains, documented throughout this book. To cite some examples, increasing consumption in urban areas and improved market performance are aspects likely to have had an influence on poverty reduction in Ethiopia. Moreover, the World Bank (2014b) has recently shown that agricultural growth (in particular, cereal growth) has been a major contributor to fast poverty reduction in the country.

Why This Book?

This book affords the title *The Economics of Teff: Exploring Ethiopia's Biggest Cash Crop* for two main reasons. First, most of the analysis documents economic fundamentals of the sector and shies away from the more agronomic

1 The word teff is written in one of three forms: teff, tef, and t'ef. Throughout this book the spelling of the word teff has been adopted for consistency. Some references may include an alternative spelling.

insights. These can be found in *Achievements and Prospects of Tef Improvement* by Assefa, Chanyalew, and Tadele (2013). Second, by area, teff is the single most important cultivated crop. Moreover, when the commercial surplus of teff was valued at producer prices in 2013/2014, its total value for producers (as high as US\$750 million) is significantly more important than any other crop—even coffee, which is Ethiopia’s main export crop—and it is estimated that the income generated by farmers from teff is as important as the income generated from all other cereals combined.

This book makes three main contributions to the international literature. First, teff is often called an “orphan” crop (Fufa et al. 2011). Teff receives little attention from international agricultural research centers (CGIAR). Primarily, this is because teff falls outside the mandate of these centers that are structured along such major international crops as maize, wheat, and rice. Also, the Ethiopian government has devoted little attention to the crop, likely because of its desire and emphasis to ensure enough food supply in the country. Given the low yields of teff compared with other crops, teff is often viewed as a low-priority crop. For these reasons, there is relatively little known on the production and marketing of teff, and hence one of the objectives of this book is to address this gap. This is especially important given the high-income elasticity of teff and the fast growth of Ethiopia’s population, which is likely to elevate teff’s importance in the country’s agricultural and food economy.

Second, the diverse datasets applied throughout the book in this research of teff, and the methods engaged in the analyses, are unique in their breadth and diversity. They include the Agricultural Sample Survey of a number of years collected by Ethiopia’s Central Statistical Agency (CSA); a large household survey fielded in high-potential agricultural areas (the Agricultural Growth Program areas) in 2011; the Social Accounting Matrix (SAM) of Ethiopia; several waves of the national Household Income, Consumption and Expenditure Survey (HICES) as well as panel data on urban consumers; price data collected by CSA on a number of retail and producer markets, as well as wholesale market prices collected by the Ethiopian Grain Trade Enterprise (EGTE). In addition, a unique large-scale survey dataset fielded at different levels of the teff value chain is investigated that explores the market functioning from major commercial teff areas to the biggest city in the country, Addis Ababa. [Table 1.1](#) gives an overview of the different datasets used in the research described in different chapters in the book. To analyze these diverse datasets, a number of different methods are employed, including productivity and efficiency analysis, spatial analysis, market and price analysis,

TABLE 1.1 Datasets used for empirical analysis

Chapter	Dataset	Who collected?
Chapter 2	Ethiopia's Central Statistical Agency (CSA) Agricultural Sample Survey	CSA
	Household Income, Consumption and Expenditure Survey (HICES)	CSA
Chapter 3	Literature review	
Chapter 4	CSA Agricultural Sample Survey	CSA
	Seed distribution	Ministry of Agriculture and Natural Resources
	Agricultural Transformation Agency (ATA) Baseline Survey	International Food Policy Research Institute (IFPRI)
Chapter 5	ESSP row-planting survey	Ethiopia Strategy Support Program (ESSP)
Chapter 6	CSA Agricultural Sample Survey	CSA
	Geographic Information Systems (GIS) data	Different sources
Chapter 7	Agricultural Growth Program (AGP) Baseline Survey	CSA
Chapter 8	CSA Agricultural Sample Survey	CSA
Chapter 9	ESSP teff value-chain survey	ESSP
Chapter 10	Social Accounting Matrix (SAM)	ESSP
Chapter 11	ESSP teff value-chain survey	ESSP
Chapter 12	Ethiopia Grain Trading Enterprise (EGTE) wholesale price survey	EGTE
	Market survey	ESSP
	CSA retail and producer prices	CSA
Chapter 13	ESSP teff value-chain survey	ESSP
Chapter 14	Ethiopian Urban Socio-economic Survey (EUSS)	Addis Ababa University/ University of Gothenburg
Chapter 15	Literature review	
Chapter 16	Literature review	

Source: Authors.

Note: ESSP is a joint program of IFPRI and the Ethiopian Development Research Institute.

consumption and demand analysis, and Computable General Equilibrium (CGE) modeling.

Third, a value-chain approach is used to analyze different issues upstream, midstream, and downstream in the value chain. In contrast to other value-chain studies that mostly rely on case studies or rapid rural appraisal methods, access to large-scale datasets at each level of the value chain has the added

advantage that it allows researchers and analysts with reasonable confidence to make a fair assessment of the functioning of the teff value chain, which is representative for large parts of the country.

Questions Addressed in This Book

The structure of this book follows the teff value chain from producers to consumers, upstream to downstream. Each of the three major sections—upstream, midstream, and downstream—poses challenging questions to try to tackle many of the issues surrounding the policy implications for developing the teff market in Ethiopia. These questions are the following:

Upstream

- What are agronomic characteristics of the teff crop, and what has been the role of agricultural research toward improving its performance?
- What are the adoption rates of improved practices, including improved seed varieties, and what is their link in real-world settings to gain higher productivity levels?
- What are the determinants of these adoption rates and differential productivity levels?
- To what extent are the missing or malfunctioning input markets constraining efficiency?
- How do producers change their production and marketing behavior and technology adoption based on market access, access to extension agents (and the type of extension advice), and household characteristics?
- What is the role of price incentives in production decisions?
- What are determinants of prices obtained by farmers?
- How is the rollout of major extension programs perceived (such as row planting of teff), and what are the impacts?
- How does adoption of improved practices, such as chemical fertilizer use, differ over space?
- What would be the expected impact of extending production of teff on Ethiopia's economy, and how might the impact differ with other cereals?

Midstream

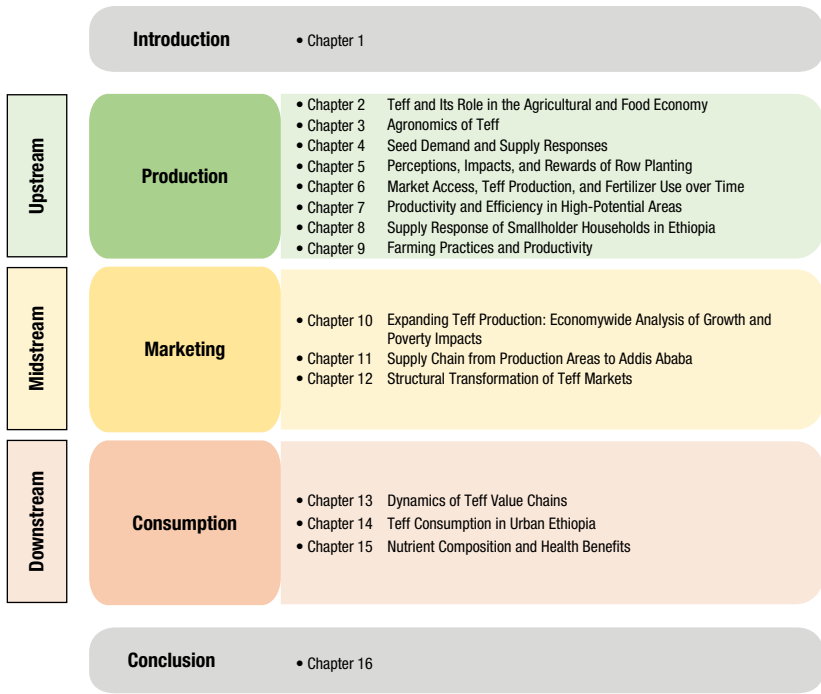
- How do farmers interact with markets—that is, when do they sell, what prices do they obtain, who do they sell to, and how does their marketing behavior change over space?
- What is the prevalent structure of the teff value chain, and what are the opportunities to improve efficiencies?
- What is the share of different value-chain agents in the final price paid by consumers?
- What is the willingness to pay for quality at different levels in the value chain?
- How are transport arrangements and the milling sector of teff organized?
- How does the teff value chain function, and how is it changing over time?
- What is the role of seasonality in marketing and in prices?
- How well are teff markets integrated and to what extent are measures of agricultural performance and marketing margins changing over time?

Downstream

- What is the role of different market outlets (traditional versus modern) in urban markets and to what extent are some vertical integration and coordination mechanisms being used?
- What is the role of the milling sector in teff distribution, and how is their role changing over time?
- What are overall consumption levels, and how are these changing over time?
- What are consumption levels of teff by income level, by region, and by urban-rural divide, and how are these changing over time?
- How do different types of teff vary in importance with respect to consumption?

Overview

Figure 1.1 gives an overview of the book. The first part of the book presents research findings upstream in the value chain, covering the production

FIGURE 1.1 Overview of the book

Source: Authors.

environment as well as farmers' output marketing. The second part examines and describes the issues encountered midstream in the value chain, along with the functioning of markets and the important transformations that are happening in this area. The third part focuses on consumption patterns in the downstream part of the value chain and discusses nutrition issues and health benefits of teff.

[Chapter 2](#) discusses the role of teff in Ethiopia's agricultural and food economy. It uses production datasets to evaluate teff's importance in area and production as well as in the number of smallholders involved in its cultivation. On the consumption side the chapter assesses the level of consumption of teff, the forms of teff consumed, and consumption patterns by region, by wealth levels, and along the rural-urban divide. [Chapter 3](#) provides an overview of the agronomics of teff. Teff is a unique crop with specific agronomic characteristics, such as small seeds and a weak stem leading to important issues with lodging. These factors strongly determine the environment in which teff can

flourish, and what possible constraints exist around improving productivity of the crop. Two important input factors that can significantly contribute to improved productivity are examined in the subsequent chapters. [Chapter 4](#) discusses the seed demand and supply responses in Ethiopia's teff seed system. As for any crop, seed systems are extremely important to improve production performance. [Chapter 5](#) presents an analysis on the potential and impact of a new and promising innovation that has recently been promoted by the Ethiopian government: row planting of teff.

[Chapter 6](#) looks at spatial characteristics of production and input use in the teff sector; temporal changes in these areas are also examined. Ethiopia is characterized by a very diverse agroecology that results in different agricultural production and consumption patterns across the country and in spatial specialization. It also has a rapidly improving road network. This particular aspect has hampered the adoption of improved technologies and access to output markets in the past. The chapter uses detailed maps and spatial techniques to investigate these issues. [Chapters 7, 8, and 9](#) cover analyses on teff productivity and its determinants. Different datasets attempt to evaluate the contribution of various input factors that potentially increase teff productivity and efficiency. Also given is a detailed overview on prevalent farming practices in commercial teff production.

The Ethiopian government is committed to significantly increase teff production. In [Chapter 10](#) a Computable General Equilibrium (CGE) model of Ethiopia is used to analyze the impact such increases might have on growth and poverty in the country. Growth in teff production is compared with the impact that growth has in other cereal sectors, including wheat and maize. The next three chapters ([11](#), [12](#), and [13](#)) analyze the teff value chain mid-stream. A detailed analysis in [Chapter 11](#) examines the structure of the teff value chain between major production areas and the largest city in the country, Addis Ababa. [Chapter 12](#) documents important changes that are happening in teff marketing systems. The drivers for these changes are identified as well. [Chapter 13](#) looks at developments in production, marketing, and consumption practices, both in major commercial zones and in the market system to Addis Ababa.

Finally, the last two chapters look at consumption aspects. [Chapter 14](#) documents teff consumption practices in urban areas, where consumption of teff is significantly higher than in rural areas. [Chapter 15](#) gives an overview of the nutrient composition of teff and looks at its health benefits. In the conclusion, [Chapter 16](#), the major findings from each chapter are drawn together,

followed by a discussion of the implications these findings have for policies and investments in Ethiopia.

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