INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
sustainable solutions for ending hunger and poverty
Supported by the CGIAR

ETHIOPIAN DEVELOPMENT RESEARCH INSTITUTE
EDRI

ETHIOPIA STRATEGY SUPPORT PROGRAM (ESSP II) Research Note 11

Crop Production in Ethiopia: Regional Patterns and Trends

Summary of ESSP II Working Paper 16, "Crop Production in Ethiopia: Regional Patterns and Trends"

Alemayehu Seyoum Taffesse, Paul Dorosh, and Sinafikeh Asrat

This paper presents an overview of crop agriculture in Ethiopia, focusing mainly on cereal production. Ethiopia's crop agriculture continues to be dominated by the country's numerous small farms that cultivate mainly cereals for both own-consumption and sales. Five major cereals (teff, wheat, maize, sorghum, and barley) occupy almost three-quarters of total area cultivated. Much of the increase in crop production in the past decade has been due to increases in area cultivated. To what extent expansion can continue remains a question, therefore obtaining higher yield rates is the challenge of Ethiopia's agricultural system.

Ethiopia's crop agriculture is complex, involving substantial variation in crops grown across the country's different regions and agroecologies. Smallholders account for 96 percent of total area cultivated and generate the key share of total production for the main crops. The core crop season is the Meher season, with harvests between September and February. Five major cereals (teff, wheat, maize, sorghum, and barley) are the core of Ethiopia's agriculture and food economy, accounting for about three-quarters of total area cultivated and 29 percent of agricultural GDP in 2005/06 (14 percent of total GDP).

All data used for the analysis presented here are from the Central Statistical Agency (CSA) of Ethiopia. The Agricultural Sample Survey data are nationally representative (with the caveat that the survey does not cover the non-sedentary population of three zones of Afar and six zones of Somali region).

Agricultural crop area and production

The Central Statistical Agency (CSA) classifies Ethiopian farms into two major groups: smallholder farms (<25.2ha) and large commercial farms (>25.2ha). The majority of farmers in Ethiopia are smallholder farms, producing mostly for own consumption and generating only a small marketed surplus. Only 40 percent of the smallholders cultivate more than 0.90ha and these 'medium-sized farms' account for three-quarters of total area cultivated. Large farms (averaging 323 hectares per farm) are not widely spread in Ethiopia and the contribution of these farms to total agricultural output is limited. In 2007/08, smallholder farmers (12.8 million farmers) cultivated 12 million hectares of land or 96.3 percent of the total area cultivated. A total of 461,000 hectares was cultivated by large commercial farms. Smallholder farms generated 95 percent of total production for the main crops (cereals, pulses, oilseeds, vegetables, root crops, fruits, and cash crops). In contrast, large farms contributed to only 5 percent of total production of these main crops and to only 2.6 percent of cereal production in particular. An exception to this is the production of sugar cane, cotton, and other industrial crops, which are mostly—or only—produced by large farms (CSA data).

Agricultural production patterns vary markedly across Ethiopia according to agroclimatic conditions, in particular, widely varying rainfall and elevation. Agricultural researchers distinguish five agroecological regions in Ethiopia: moisture reliable cereal-based highlands, moisture reliable enset-based highlands, humid lowlands, drought prone highlands, and pastoralist area. Most smallholder farmers reside in the moisture reliable cereal-based highlands (i.e. 59 percent of total cultivated area). Farm area in the drought-prone highlands accounts for 26 percent of total area cultivated. With farmers using virtually no irrigation, reliable rainfall is an important condition to achieve good agricultural productivity. However, in the moisture-reliable enset-based highlands (11 percent of total farm area) population pressure has diminished farm size to such an extent that out-migration has become a major pathway out of poverty. Cultivation in the two other areas (humid lowlands and pastoralist area) is relatively less important, accounting for only 3.9% of all cultivated area in Ethiopia.

Averaged over the period 2004/05–2007/08 cereals were grown on 73.4 percent of the total area cultivated, by a total of 11.2 million farmers (Table 1). Together, these smallholders produce a yearly average of 12 million tons of cereals, which is 68 percent of total agricultural production. Pulses and oilseeds are the second and third crop, respectively, according to acreage. Although both the share in acreage and in production of coffee, chat, and vegetables—all cash crops—are small, their significance is growing as the share of area cultivated increased by 12.3, 6.1, and 11.7 percent, respectively, per year from 2003/04 to 2008/09. Enset forms the staple crop in the moisture reliable enset-based highlands. In 2008/09 it was produced on 2.5 percent of total area cultivated.

Table 1. Crop area and production (smallholder farms, Meher season); averaged over 2004/05–2007/08

		Area cultivated		Production	
Crop	Number of holders	Share in total (%)	Level (ha)	Share in total (%)	Level (metric tons)
Grain	11,519,148	92.7	10,382,365	79.8	14,090,273
Cereals	11,156,837	73.4	8,230,211	68.3	12,062,972
Teff	5,462,782	20.9	2,337,850	13.6	2,407,948
Maize	7,287,931	14.2	1,595,238	18.8	3,314,286
Wheat	4,118,164	12.8	1,439,098	13.0	2,293,308
Sorghum	4,253,534	12.8	1,429,886	12.5	2,216,181
Barley	3,842,462	9.1	1,024,390	7.5	1,326,422
Pulses	6,377,027	12.4	1,384,499	8.5	1,495,547
Oilseeds	3,127,131	6.9	767,655	3.0	531,754
Vegetables	4,936,741	1.0	106,585	2.4	424,825
Root crops	4,757,733	1.6	174,826	8.3	1,473,292
Fruit crops	2,658,415	0.5	51,078	2.3	403,459
Chat	2,068,262	1.3	141,881	0.7	126,427
Coffee	3,049,120	2.7	305,940	1.2	210,671
Hops	1,685,422	0.2	23,457	0.1	26,311

Source: Authors' calculations using CSA data

In the main agricultural regions in Ethiopia there are two rainy seasons, the Meher and the Belg, and consequently there are two crop seasons. Meher is the main crop season. It encompasses crops harvested between Meskerem (September) and Yeaktit (February). Crops harvested between Megabit (March) and Nehase (August) are considered part of the Belg season crop. The Meher season is overwhelmingly important (96.9 percent of total crop production and 95.5 percent of total cereal production in 2007/08). Only smallholders cultivate crops during the Belg season and yields are smaller in the Belg than in the Meher season. In 2007/08 4.5 percent of national ceral production was produced in the Belg season. The most important contribution of the Belg season to total production is found for maize: 22.0 percent of total maize area was cultivated in the Belg season and this resulted in 9.5 percent of total maize production.

Cereal production trends

Since the start of the collection of national agricultural statistics in the 1960s, teff has always accounted for the largest share of cereal area cultivated. However, over the past five decades the share of teff has declined gradually (a decrease by 5.8 percent from the 1960s to the first decade of the 2000s), while the share of maize has increased by 7.8 percent. Compared to teff and maize, the share of other cereals stayed relatively stable over time.

Growth in cereal production accelerated to 7 percent per year from 1999/2000 to 2008/09 (with teff, sorghum, and wheat having the fastest annual growth rates), reaching an average production of 10.94 million tons of cereals per year. Also yield levels of all five major cereals increased rapidly in this period. As cereal production and yield growth were particularly rapid from 2004/05 to 2008/09, it is worth examining the growth rate for the five cereals separately in this period (Table 2).

Table 2. Annual growth rates of production, area cultivated and yield per cereal crop, 2004/05–2007/08

Crop	Production		Area Cultivated		Yield	
	Level* (quintal)	Annual growth rate (%)	Level (ha)	Annual growth rate (%)	Level* (quintal/ha)	Annual growth rate (%)
Cereals	120,629,724	12.2	8,230,211	4.8	14.0	6.2
Teff	24,079,480	15.9	2,337,850	6.7	10.2	7.7
Barley	13,264,217	0.7	1,024,390	-3.4	13.0	4.5
Wheat	22,933,077	2.1	1,439,098	0.6	15.9	1.5
Maize	33,142,865	18.9	1,595,238	9.0	20.6	7.8
Sorghum	22,161,808	18.3	1,429,886	7.4	15.4	8.9

Source: Authors' computation using CSA data
Note: * is the average for 2004/05–2007/08

Average annual growth was fastest for maize and sorghum production, followed by teff production. Wheat production increased only moderately. The slowest output growth was recorded in barley production, due to a decline in barley acreage. It is interesting to note that, for the main cereals, yield growth was faster than acreage expansion during this period, so the increased production rates were more the result of increased yields than of increased acreages. An exception to this was maize, a crop considered to have the highest potential for yield increases.

Decomposition analysis of cereal production

Changes in cereal output are decomposed into changes in area and yield across various development domains and across time periods for 1998/99–2007/08. We also examined the contribution of changes in prices and the allocation of acreage to the changes in gross crop revenues. Acreage expansion was the more important source of growth in output for four of the five major cereals (the exception is teff) in almost all development domains. Similarly, acreage expansion was the top source of revenue change. Increases in yield made the second largest contributor to revenue growth in the case of maize, sorghum, and wheat. In contrast, real price rises stood second to acreage expansion as the origin of growth in barley and teff revenue (in fact, price and acreage contributed equally to teff revenue growth). However, the source of change in revenue differed across periods. During 1999/2000–2001/02 acreage expansion was the dominant source. While, during 2001/02–2004/05 price increases were the top contributor to revenue growth and 2005/06–2007/08 was characterized by mixed outcomes. Change in allocation of cereal acreage was rather limited and thus contributed very little to revenue expansion.

Conclusions and opportunities

Much of the increase in crop production in the past decade has been due to increases in area cultivated, although better yields also contributed to the augmented production in the period 2004/05–2007/08. With little suitable land available for expansion of crop cultivation, especially in the highlands, future cereal production growth will need to come from yield improvements. Current cereal yields are low, by international standards, indicating growth potential. Use of inputs is at a low level, suggesting substantial scope for raising productivity through irrigation, improved seeds, and fertilizers. However, it seems that growth in agricultural real incomes will also require more diversification and a shift to higher-value crops, in order to respond to changing consumption baskets driven by the increasing per capita income growth in the country.

*This research note is intended to promote discussion; it has not been formally peer reviewed but has been reviewed by at least one internal and/or external reviewer. **The Ethiopia Strategy Support Program** of the International Food Policy Research Institute (IFPRI) works closely with the government of Ethiopia, and other development partners to provide information relevant for the design and implementation of Ethiopia's agricultural and rural development strategies. For more information, see http://essp.ifpri.info/ or http://www.edri.org.et/.*

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
2033 K Street, NW | Washington, DC 20006-1002 USA
T: +1.202.862.5600 | F: +1.202.457.4439
Skype: ifprihomeoffice | ifpri@cgiar.org | www.ifpri.org

IFPRI–ESSP ADDIS ABABA
P.O. Box 5689, Addis Ababa, Ethiopia
T: +251.11.617.2000 | F: +251.11.646.2318
mahlet.mekuria@cgiar.org | http://essp.ifpri.info

ETHIOPIAN DEVELOPMENT RESEARCH INSTITUTE
P.O. Box 2479, Addis Ababa, Ethiopia
T: +251.11.550.6066; +251.11.553.8633 | F: +251.11.550.5588
info@edri-eth.org | www.edri-eth.org

The Ethiopia Strategy Support Program (ESSP) is financially supported by the United States Agency for International Development (USAID) and the Department for International Development (DFID) of the government of the United Kingdom and is undertaken as part of the CGIAR Research Program on Policies, Institutions, and Markets (PIM) led by the International Food Policy Research Institute (IFPRI). This publication has been prepared as an output of ESSP and has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and do not necessarily reflect those of IFPRI, the Ethiopian Development Research Institute, USAID, DFID, PIM, or CGIAR.

Copyright © 2012 International Food Policy Research Institute. All rights reserved. To obtain permission to republish, contact ifpri-copyright@cgiar.org.