



Greenhouse Gas Emissions in Ethiopia

Ethiopia Numbers at a Glance (2011)

141 MtCO₂e*

Total GHG emissions
(0.3% of world total)
World: 46,906 MtCO₂e

89,393,063

Population
World: 6,964,618,177

1.58

tCO₂e per capita
World: 6.73 tCO₂e

US\$23,107 Million

GDP**
World: US\$54,034 Billion

6,108

tCO₂e/million US\$ GDP
World: 868 tCO₂e/million US\$ GDP

+65 MtCO₂e (+86%)

Change in GHG emissions
(1993–2011)
World: +13,497 MtCO₂e
(+40%)

Source: WRI CAIT 2.0, 2015

Emissions including Land-Use Change and Forestry

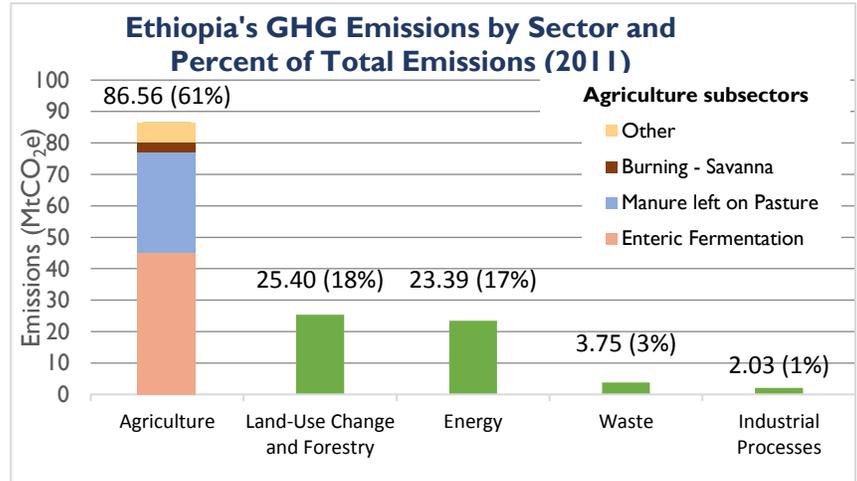
*Million metric tons of carbon dioxide equivalent

**Gross Domestic Product (GDP) in constant 2005 US\$

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Greenhouse Gas (GHG) Emissions by Sector

Ethiopia's GHG profile is dominated by emissions from the agriculture sector, followed by land-use change and forestry (LUCF), and energy sector emissions. The agricultural activities that contribute the most to the sector's emissions are enteric fermentation (52%), manure left on pasture (37%), and burning of the savanna (4%).¹



Sources: WRI CAIT 2.0, 2015; FAOSTAT, 2015

Change in GHG Emissions in Ethiopia (1993 – 2011)

Ethiopia's emissions grew by 86% between 1993 and 2011.² As illustrated on the graph on the next page, the average annual change was 4%, with sector-specific annual change as follows: agriculture (3%), LUCF (5%), energy (4%), waste (2%), and industrial processes (16%).

Agriculture: Ethiopia's agriculture sector is characterized by subsistence-oriented, low input/low output farming with over 90% of cultivated land dependent on rain. The majority of the sector consists of smallholder farmers with less than two hectares of land.³ The eastern, pastoral part of the country is home to over half of Ethiopia's livestock herd, which is the largest in Africa. The grazing land in this area is mostly unsuitable for farming, while agriculture in the densely populated highlands is a mix of animal and crop husbandry.⁴ According to the Agricultural Transformation Agenda Progress Report, agricultural productivity remains exceptionally low in Ethiopia, with yields of smallholder farmers below Sub-Saharan Africa averages due to limited use of irrigation and improved seed and fertilizer. Furthermore, poor land management practices have led to severe land degradation. Differentiated interventions are necessary for the poorest farmers living in marginalized areas and/or on very small plots of land.

LUCF: There is enormous pressure on Ethiopia's forests. Due to conflicting data sources and varied definitions of forests, determining a reliable estimate of forest cover and forest cover change in Ethiopia is challenging.⁵ The major direct drivers of deforestation and degradation are forest clearance and land-use conversion for smallholder agricultural expansion, promotion of large-scale commercial and state development investments in forest frontiers, illegal extraction and collection of forest products (mainly fuelwood collection and charcoal making), human

¹ Food and Agriculture Organization of the United Nations Statistics Division (FAOSTAT), viewed October 28, 2015: http://faostat3.fao.org/browse/area/*/E

² World Resources Institute Climate Analysis Indicators Tool (WRI CAIT) 2.0, 2015. Emissions including Land-Use Change and Forestry

³ Ethiopian Agricultural Transformation Agency, 2015. Agricultural Transformation Agenda Progress Report Covering 2011-15 in the GTP I Period. See <http://www.ata.gov.et/wp-content/uploads/ATA-Progress-Report-2015.pdf>

⁴ USAID, 2011. Feed the Future (FTF) Multi Year Strategy Ethiopia

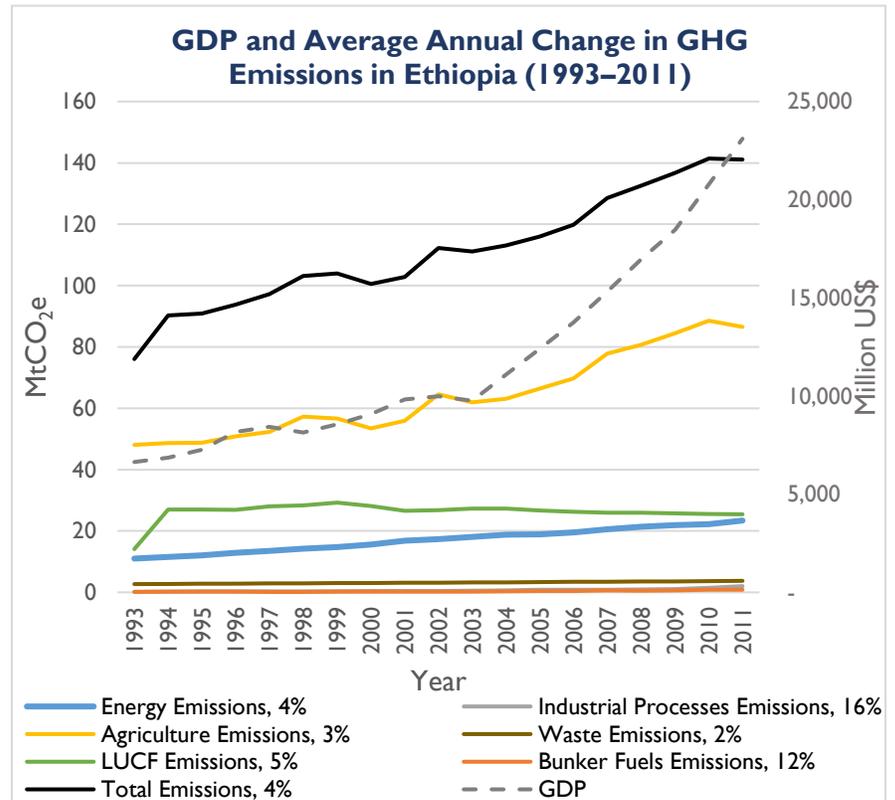
⁵ The REDD Desk, viewed October 30, 2015. See <http://theredddesk.org/countries/ethiopia>

settlement in forest areas, forest fires, and development of infrastructure and road networks. Indirect drivers of deforestation are the dependence of the rural poor on natural resources, rapid population growth, legal and institutional gaps such as the lack of stable and equitable forest tenure and property right arrangements, lack of a clear and standard definition and classification of forests, weak forest governance and law enforcement, and ineffective coordination among government agencies.⁶ Ethiopia has the potential to mitigate an estimated 2.76 billion tons of carbon through protection and sustainable management of forest resources.⁷

Energy: Total primary energy supply more than doubled from 1990 to 2012, with biofuels and waste accounting for 93% in 2012, followed by fossil fuels with 6%, and 1% from renewables.⁸ The electric grid system consists almost entirely of renewable energy, nearly all from hydropower, with wind and geothermal. Ethiopia's [Intended Nationally Determined Contribution \(INDC\)](#) notes that 77% of the population lacks access to modern energy sources and relies on wood for fuel. Given rural households' use of fuel wood and lack of access to electricity, Ethiopia will develop biogas and reduce the demand for fuel wood by promoting efficient cook stoves.⁹

Carbon Intensity: GHG Emissions Relative to GDP

GDP grew from US\$6.4 billion in 1991 to 23.1 billion in 2011 according to WRI CAIT. GDP grew faster than total GHG emissions, indicating that the carbon intensity of the economy in 2011 had decreased relative to 1991. The Climate Resilient Green Economy (CRGE) strategy aims to decouple economic growth from natural resource consumption and GHG emissions and sets a goal to achieve carbon-neutral growth and middle-income status before 2025, which will require increasing agricultural productivity, encouraging sustainable land use, building an industrial base, and fostering export growth and diversification. It will require decreasing the share of GDP contributed by agriculture and creating off-farm jobs in the services and industry sectors.¹⁰



Source: WRI CAIT 2.0, 2015

Climate Change Mitigation Targets and Plans

In its INDC, Ethiopia pledges to cap its 2030 GHG emissions at 145 MtCO₂e, which equates to a 64% (255 MtCO₂e) reduction from projected business as usual emission levels in 2030. The reduction includes 90 MtCO₂e from agriculture, 130 MtCO₂e from forestry, 20 MtCO₂e from industry, 10 MtCO₂e from transport, and 5 MtCO₂e from buildings. The INDC is in line with Ethiopia's CRGE, Ethiopia's strategy for addressing mitigation objectives and climate change adaptation, whose implementation would decrease per capita emissions by 64%.

⁶ Center for International Forestry Research (CIFOR), 2015. Occasional Paper 127: The context of REDD+ in Ethiopia, drivers, agents and institutions

⁷ Moges, Y., Eshetu, Z., and Nune, S., 2010. *Ethiopian Forest Resources: Current Status and Future Management Options in View of Access to Carbon Finances*, prepared for the Ethiopian Climate Research and Networking and the United Nations Development Programme. See <http://www.norway.org.et/PageFiles/628168/Ethiopia%20Forest%20Resources%20Current%20Status%20and%20Future%20Management%20Options%20ECRN-UNDP%20-%202010.pdf>

⁸ International Energy Agency Energy Balances, viewed October 30, 2015. See <http://www.iea.org/statistics/statisticsearch/report/?country=ETHIOPIA&product=balances&year=2012>

⁹ Ministry of Environmental Protection and Forests, 2013. CRGE Highlights newsletter, Volume 1, No. 3, July 2013. See <http://phe-ethiopia.org/admin/uploads/attachment-1655-CRGE-Highlights-NL-Final-July-2013.pdf>

¹⁰ Grantham Research Institute on Climate Change and the Environment, 2015. The 2015 Global Climate Legislation Study – Ethiopia