

## Unpicking the socioecological drivers and impacts of agricultural expansion in Ethiopia

Given Ethiopia's increasing reliance on agriculture as a mainstay of livelihoods, agricultural expansion is inevitable. This briefing explores the main agents, drivers and implications – and why policies must balance the trade-offs between the competing objectives of food security, limiting biodiversity loss and protecting social equality.

### Agricultural expansion

The agricultural sector has been an important contributor to Ethiopia's economic growth over several decades and will likely continue to be a key driver of future development. The government has long recognised the importance of transforming agriculture to achieve stability and long-term growth. In the

1990s, the government launched its Agricultural Development-Led Industrialization strategy (ADLI). The strategy puts increased productivity, production and product quality in farming at the heart of its economic development plans.



Photo: Agricultural practices (farming, grazing) and establishing settlements within forested areas. Credit: PSI/Sentinel

### Summary

In Ethiopia, a rapidly growing population, widespread poverty, unemployment, low agricultural productivity and a lack of alternative income sources mean that rural people often expand agricultural land into forested areas, leading to loss of ecosystem services. There is an urgent need for policymakers to strike a balance between increasing food production to meet rising food demand and reduce poverty while meeting conservation objectives. This includes addressing low agricultural productivity and increasing support for research, technological development, extension services and capacity building.

### Background

This policy brief is based on fieldwork findings from reconnaissance surveys in Ethiopia conducted in July 2019 as part of the Sentinel project. The surveys involved a rapid assessment of the socioeconomic and environmental impacts of agriculture across seven communities in Ethiopia.



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Agriculture accounts for over a third of GDP, and around three-quarters of the economically active population is engaged in agricultural production.<sup>1</sup> Agricultural production has increased significantly, with increases in agricultural GDP averaging 6.5% per year between 2005/06 and 2018/19, even while agriculture's share in total GDP has fallen. Land area expansion is known to be the primary contributor to increases in agricultural GDP during this period. In more recent years, rising crop yields coupled with continuing agricultural area expansion has contributed to agricultural GDP growth.<sup>2</sup>

Over the last two decades in Ethiopia, more land has been converted from forest and woodland vegetation to produce staple crops. Agriculture is estimated to be the main driver for around 80% of deforestation worldwide, including Ethiopia.<sup>3</sup> Between 2001 and 2019, Ethiopia lost 410,000 hectares of tree cover. Land under cereal production has increased from 7.2 million hectares in 2000 to 10.2 million hectares in 2016. The demand for agricultural commodities is projected to increase inevitably (70–100% by 2050).<sup>4,5,6</sup> However, ongoing gains in crop yields are not keeping pace with population growth and increases in food demand.<sup>7,8</sup> As Ethiopia's agricultural policy aims to ensure domestic food security and economic growth, further expansion seems inevitable in the next decade. However, gains in agricultural production through expansion come at a cost: depleted forest habitats and biodiversity, especially around long-inhabited areas.

Expanding agricultural frontiers into forest margins may pose substantial trade-offs between economic, social and environmental outcomes with significant implications for livelihoods and ecosystem services. A key concern is to understand the economical, equity and environmental trade-offs and synergies in the context of achieving food security for a rapidly growing population without posing significant damage to the environment. This corroborates the agenda of the Sustainable Development Goals (SDGs) of 'zero hunger' (SDG 2), reducing inequality (SDG 10) and conserving ecosystems (SDG 15). This is at the heart of the Sentinel project. These three SDG outcomes are not independent of each other. They interact in both positive and negative ways, creating the potential for synergies and trade-offs. Developing the agricultural sector necessitates tracking these interactions and assessing if the three competing objectives are being achieved without compromising each other's goals.

## Box 1. Background in brief – Ethiopia

- Ethiopia is the second-most populous country in Africa, with an estimated 109.2 million people and a population growth rate of 2.5%. Ethiopia's population is expected to reach 174 million by 2050.<sup>9</sup>
- About 80% of the population lives in rural areas, of which over 88% inhabits the highlands, where resources are considered exhausted and environmentally degraded.
- About 25.6% of the rural population lives below the poverty line.<sup>10</sup>
- Cereals (teff, wheat, maize, sorghum and barley) account for more than 80% of total cultivated land and 14% of GDP.
- About 14.7% of the country's land area is covered by forest, with woodland and shrubland accounting for another 44.7%.<sup>11</sup>

## Drivers and agents of expansion

Agricultural expansion is a complex issue and is underpinned by a wide array of drivers. Due to the multi-scale and context-specific nature of these drivers, interventions to address them must operate across scale and contexts.<sup>12</sup> The main causes of agricultural expansion include high population pressure and the demand for more food, rising incomes and the demand for cash crops, low smallholder agricultural productivity and the lack of alternative income sources. Furthermore, low institutional capacity, weak natural resource governance and tenure insecurity can push small-scale farmers to move into forests and expand agricultural lands. Availability of forestland for agricultural production is also another factor that encourages expansion of agricultural land.<sup>13</sup> A lack of a well-defined national land-use and planning policy, strategies and guidelines further encourage agricultural expansion.

In July 2019, the Sentinel project conducted reconnaissance surveys<sup>14</sup> across seven communities in Ethiopia (see Figure 1). Data was gathered using a suite of rapid-assessment participatory rural appraisal tools to understand the drivers and impacts of agricultural expansion in six of the pre-selected sites, as well as the potential for future expansion and feasibility of further in-depth research. The survey findings revealed the site-level drivers of agricultural expansion the participants perceived and identified similar motives for expanding the size of crop land areas:

- Different social groups are involved in agricultural expansion into natural habitats including the rich, the moderately rich and the poor, as they aim to increase their agricultural income by expanding into additional and more fertile land.
- Population growth was cited as the key driver for increased demand for new agricultural land. Respondents also identified

other drivers, including labour mobility and migration from nearby areas, settlement processes, unemployment, and the demand for agricultural land by the landless (especially youth, and young men in particular).

- The rise in market prices for some agricultural commodities has pushed farmers to expand their agricultural land to increase crop production and productivity.
- Uncertain property and land-use rights of forested areas are also factors determining expansion into nearby forest areas.
- As livestock populations increase, the need for additional grazing areas is also causing land-use changes and putting pressure on the nearby forest.

By and large, a household's decision to expand its agricultural land rests with the head of the household. Youth and people who migrated to nearby locations were found to be key agents of expansion. We found some patterns that exist in terms of the drivers reported at site level (Figure 2).

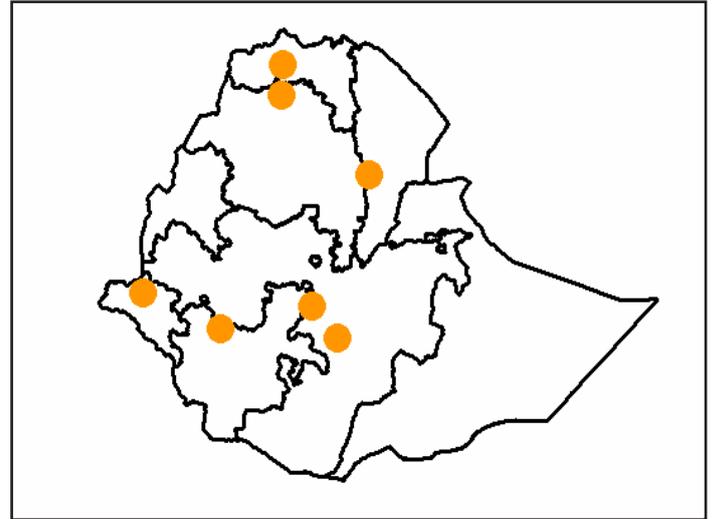


Figure 1. Map showing approximate locations of the seven study sites selected.

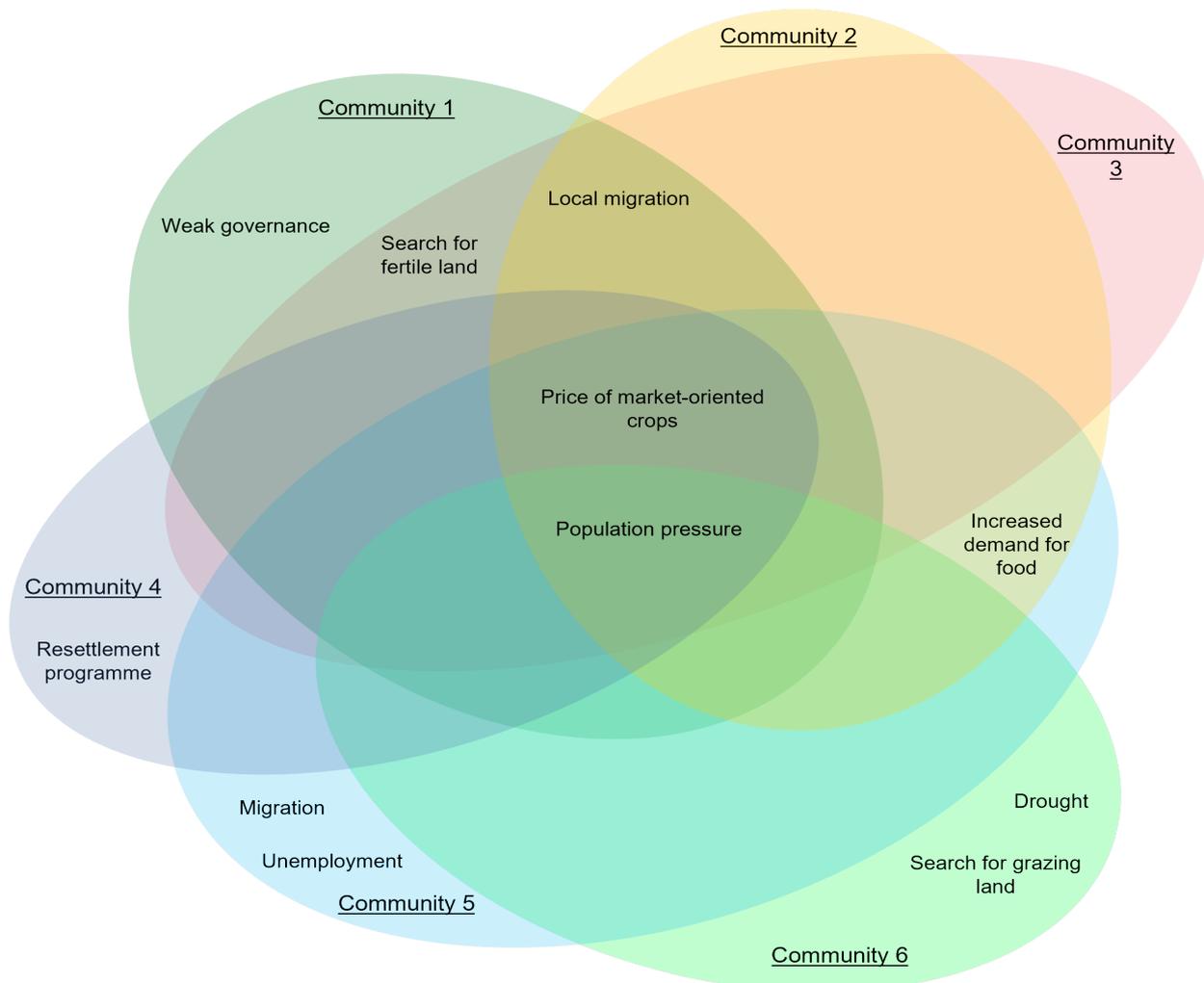


Figure 2. Perceived site-level drivers of agricultural expansion for six of the sites in Ethiopia (sites are not named in order to maintain confidentiality).

## Main impacts of agricultural expansion on people and planet

Agricultural expansion has notable social, economic and environmental influences on individual smallholder farmers and the surrounding community as a whole. Impacts of agricultural expansion are partly understood by the local communities in the six study sites in Ethiopia. Here, we present local communities' perception of the likely impacts of expansion, according to data collected during the Sentinel reconnaissance surveys.

## Socioeconomic impacts of agricultural expansion

In terms of positive socioeconomic impacts, participants reported **increased yields** and **crop diversification**. This has helped rural communities to satisfy their consumption needs, which is equally important for both improving household food security and diversifying risk. But despite these positive gains, community members also reported negative impacts of expansion into natural habitats:

- Rural communities use a variety of forest products as sources of income, including firewood, charcoal production, honey, grass or fodder and medicinal plants. If agricultural expansion into natural habitats continues unchecked, households could lose these benefits.
- Increased rate of exposure to soil erosion and households' vulnerability to flooding and drought.
- Farmers noted that rainfall is becoming unpredictable due to the changing climate, a factor which makes farming riskier.

## Environmental impacts

The localised degree of environmental impacts and land degradation is dependent on the production practices used by local farmers. All interviewed farmers reported a noticeable decline in the diversity and abundance of native species (including a decline in wild honeybee populations). This decline in native species was coupled with a rise in the reported prevalence of invasive pest species (including the fall armyworm *Spodoptera frugiperda*). Much of this species loss and environmental degradation was attributed to factors such as deforestation, land degradation and/or climate change.

All communities reported increasing incidences of flooding or drought (depending on the site), with increasingly erratic rainfall patterns. A further impact assessment of the adjacent forests/woodlands revealed these areas to be generally highly degraded, often with extensive signs of human use and deforestation activities, and little evidence of regrowth (Figure 3).

Of natural forests adjacent to Sentinel research sites, participants scored 67% as highly degraded.



Figure 3. Extent of forest degradation according to survey participants, based on a rapid 16-point scorecard assessment method. [Green segment indicates 'not degraded'.]

## A way forward

Achieving sustainability commitments entails scaling up collective action through multi-stakeholder partnerships. Achieving SDGs 2, 10 and 15 outcomes are not independent of each other. Rather they interact in both positive and negative ways with the potential for trade-offs. In the Ethiopian context, targeting SDG 2 implies improving food access for about 36 million undernourished people. Increasing food production and ensuring food security remain the highest priorities for the Ethiopian government. As in other developing countries, the reconnaissance surveys indicate that small-scale agricultural expansion is a key factor for the loss of forest habitat and biodiversity. Given the government's national drive for food security, cropland expansion will remain a key strategy to increasing food production.

Moreover, global food demand is expected to double by 2050. Doubling food production in the next 30 years can be expected to result in the conversion of substantial areas of forests into agricultural lands, unless alternative options are in place. Thus, developing the agricultural sector will require tracking the interactions and assessing if the three competing SDG objectives are being achieved without compromising each other's goal.

Having a good understanding of the processes of agricultural expansion and tackling the different drivers of expansion operating at different scales is crucial. Policies, strategies at national level and action plans should consider all land uses in a holistic way and ensure that key objectives among the different sectors do not compete with each other. The government should play a critical role in striking a balance between increasing food production to meet the rising food demand and reduce poverty while also meeting conservation objectives.

However, relying on agricultural intensification alone as a main strategy to solve the biodiversity loss problem is no longer the way forward, unless accompanied by stronger governance of natural resources.<sup>15,16</sup> Policymakers at national and regional levels should start a dialogue with relevant stakeholders so that synergies can be harnessed, and all competing needs balanced. This includes addressing the agricultural sector's low productivity, through



increased support for research, technological development, extension services and capacity building to sustainably increase agricultural productivity. Local perceptions of the importance of nature should be increased, as well as improving natural resource governance and resource-use efficiency. Sustainable farming practices such as improved water management, conservation agriculture and focusing on more alternative approaches such as agroforestry practices should also be adopted. This will be crucial to halting and reversing environmental degradation.

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# Sentinel

Social and Environmental Trade-Offs  
in African Agriculture

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Front cover — Blister beetle observed during rapid ecological assessments. Credit: Adam Devenish, Imperial College London/Sentinel.

Page 5 — Farmer herding goats in one of the study sites. Credit: Adam Devenish, Imperial College London/Sentinel.

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