

## Social and Environmental Trade-Offs in African Agriculture

Dear Colleague,

The Sentinel project officially drew to a close at the end of March this year. However, our findings are still being written up and we plan to publish several briefings and research papers over the coming weeks and months. Our newsletters will therefore continue so that we can keep you up to date with our findings as they are published.

We are pleased to share with you the latest publications and blogs from the Sentinel project website below. To find out more, visit [www.sentinel-gcrf.org](http://www.sentinel-gcrf.org) or click on the links.



### Briefing

#### [The nexus between soil degradation and agricultural expansion in Zambia](#)

Dora Neina, Jacob Mwitwa, Barbara Adolph

Soil degradation is caused by overcultivation and nutrient depletion by crops. A well-resourced farmer who maintains a proper nutrient balance through soil fertility improvement programmes may be able to curb this degradation. The use of pesticides and fertilizers also affects the biological properties of the soil and nutrient recycling. Although the study did not reveal a causal link between farmer's resources and soil fertility, soils exposed to degradation may compel farmers to seek fertile soils in natural habitats to produce better yields.



#### **Briefing**

### **[Future trade-offs to 2050: land cover change, biodiversity and agriculture in Zambia](#)**

Geoffrey Griffiths, Abbie Chapman, Jo Davies, Adam Devenish, Nugun P Jellason, Kennedy Kanja, Jane M Kwenye, Syed Amir Manzoor, Jacob Mwitwa, Tim Newbold, Darius Phiri, Elizabeth Robinson, Monika Zurek

In Zambia, the demand for cereal to feed a growing population is predicted to double by 2050. As pressure on agricultural land increases, there is an urgent need to develop tools to minimise conflicts between competing land uses. To date, most of the research exploring land use conflicts has been conducted at global scales rather than national or sub-national ones.

This briefing describes the process to translate the 'storylines' that emerged from a national stakeholder scenarios development workshop held by the Sentinel project in Zambia in 2018 and presents the results as national maps of projected land cover changes to 2050.



#### Briefing

### [Reducing the biodiversity impacts of agriculture in Ethiopia, Ghana, and Zambia](#)

Alison Fairbrass, Tim Newbold, Abbie Chapman, Tagel Gebrehiwot, Dora Neina, Jacob Mwitwa

There is a close link between biodiversity and agriculture. Agriculture requires that surrounding ecosystems are healthy and resilient in order to support valuable ecosystem services (such as natural pest controllers and pollinators). Biodiverse ecosystems are also more diverse in available nutrients to support crops and biodiversity is considered a natural way to protect against the effect of climate change.

This series of 3 policy briefings provide recommendations on policies that minimise agricultural expansion in areas of high biodiversity value in [Ethiopia](#), [Ghana](#), and [Zambia](#) and sustainable agricultural practices to maintain healthy and sustainable food systems.



#### Briefing

### [Understanding the impacts of farmland expansion on rural households' livelihoods: empirical evidence from Ethiopia](#)

Hailemariam Teklewold, Tagel Gebrehiwot, Nugun P Jellason

Farmland expansion is a key rural household income strategy. However, it is also a major contributor of global forest loss. Ethiopia is highly dependent on agriculture for economic growth, with farmland expansion and intensification being part of the country's growth and transformation strategies to increase agricultural production and meet the rising demand for food. However, this threatens to lead to increased deforestation and loss of grasslands.

This briefing seeks to look at the impacts of farmland expansion on rural households' livelihoods in Ethiopia. It shares findings from four important questions that are salient to the farmland expansion debate.



## Briefing

### [Determinants of farmland expansion in the forest margins of Ethiopia](#)

Tagel Gebrehiwot, Hailemariam Teklewold

Forest clearing is a severe problem in most developing nations. To date, much of the deforestation in the tropics is driven by agricultural expansion, primarily as a result of converting forestland for crop production.

This briefing covers highlights from a forthcoming study showing that, regardless of the sources, agricultural intensification practices can serve to mitigate farmland expansion. It also shows that the level of market participation is an important factor as market-oriented approaches can enhance agricultural intensification.



## Blog

### [Sentinel holds final partner workshop](#)

Alasdair Brown

As we approached the end of the project, Sentinel partners came together in Mid-February 2022 to hold a final project workshop. The aim of this was to bring together all project partners to discuss Sentinel's successes, lessons learnt from how the project was run and key messages that have emerged from our research.

Although we are sad to be at the end of the Sentinel project, the workshop provided a great opportunity for the whole team to come together and reflect on what we had achieved, the lessons learnt, and the key messages of our research.

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**Sentinel** is an interdisciplinary research project seeking to address the challenge of achieving 'zero hunger' in sub-Saharan Africa, while at the same time reducing inequalities and conserving ecosystems.

