

Reducing the biodiversity impacts of agriculture in Ghana

This policy briefing recommends policies that minimise agricultural expansion in areas of high biodiversity value and sustainable agricultural practices to maintain healthy and sustainable food systems.

The intimate relationship between biodiversity and agriculture

There is a close link between biodiversity and agriculture. Agriculture requires that surrounding ecosystems are healthy and resilient to support valuable ecosystem services.^{1,2} Some species act as natural pest controllers, reducing the pests and pathogens that threaten crops. Other species act as pollinators for crops. Biodiverse ecosystems are more diverse in the available nutrients to support crop production. For example, trees on cocoa farms in Ghana support ecosystem services worth US\$164 per farmer per hectare per year by providing habitat for pollinating insects and supporting nutrient cycling.³

Policymakers must promote the conservation of Ghana's areas of high biodiversity value (see Box 1) to maintain ecosystem services that support agriculture. If crops are grown in areas of high biodiversity value, this will degrade the health and resilience of ecosystems, and farmers will lose valuable

ecosystem services that support agriculture.

Methodology

Global-scale datasets – from EarthStat, the IUCN Red List, FAOSTAT, Birdlife International, WWF, Key Biodiversity Areas, and the Observatory of Economic Complexity – were used to map areas in Ghana where both biodiversity value and crop production are high.

The research team at University College London (UCL) used these maps to identify the spatial overlap between areas of high biodiversity value and areas of crop production. These are hotspots of trade-off risk – areas where environmental goals might be at risk of conflict with plans for agricultural development.

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Oil palm and plantain are among the most important crops in Ghana.⁴ They also

Key messages

Minimise agricultural expansion and intensification in high biodiversity areas. Use maps to identify regions where agriculture-biodiversity trade-off risks are highest.

Agricultural policies should consider long-term ecosystem resilience to support crop production. These policies should also maximize ecosystem resilience by promoting biodiversity-friendly agricultural management practices.

When agricultural production occurs in or near areas of high biodiversity value, such as protected forest areas, policymakers should promote the use of biodiversity-friendly agriculture.

Certain crops, particularly oil palm and plantain, are grown close to high biodiversity areas and pose the highest risk to Ghana's biodiversity. Therefore, policymakers should focus on promoting the sustainable production of these crops.

Different crops will require different types of biodiversity-friendly management. Therefore, biodiversity-friendly agriculture policies should make crop-specific recommendations on management practices.

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occupy an extensive footprint within and surrounding areas of high biodiversity value (Figure 1). These crops currently pose the highest risk to biodiversity in Ghana because of the large amount of land used to cultivate them within and surrounding the areas of the highest biodiversity value.

Policymakers should minimise agricultural expansion and intensification in areas of high biodiversity value. Where this is unavoidable, they must promote biodiversity-friendly farming practices to reduce negative ecological impacts from agriculture in these high biodiversity value areas.

Different crops have different impacts on biodiversity and require different biodiversity-friendly management approaches to reduce their harmful effects on biodiversity. Therefore, policymakers should encourage farmers to use biodiversity-friendly agriculture appropriate for specific crops.

Many biodiversity-friendly practices are relatively complex and require a good understanding of the local ecosystem. They can be knowledge-intensive, context-specific, and provide benefits only in the long term. Research should be promoted that investigates which biodiversity-friendly agricultural practices deliver environmental, social and economic benefits in areas of high biodiversity value in Ghana.

A focus on self-sufficiency or international trade will not necessarily determine the impact of agriculture on biodiversity. It is more important where and how crops are grown rather than whether they are consumed domestically or traded internationally.

Policymakers should engage institutions in Ghana in research and policy development on biodiversity-friendly agricultural practices, including the University of Ghana, Kwame Nkrumah University of Science and Technology, University for Development Studies, and the University of Environment and Sustainable Development. Policymakers should also engage with nongovernmental

Box 1. Definitions

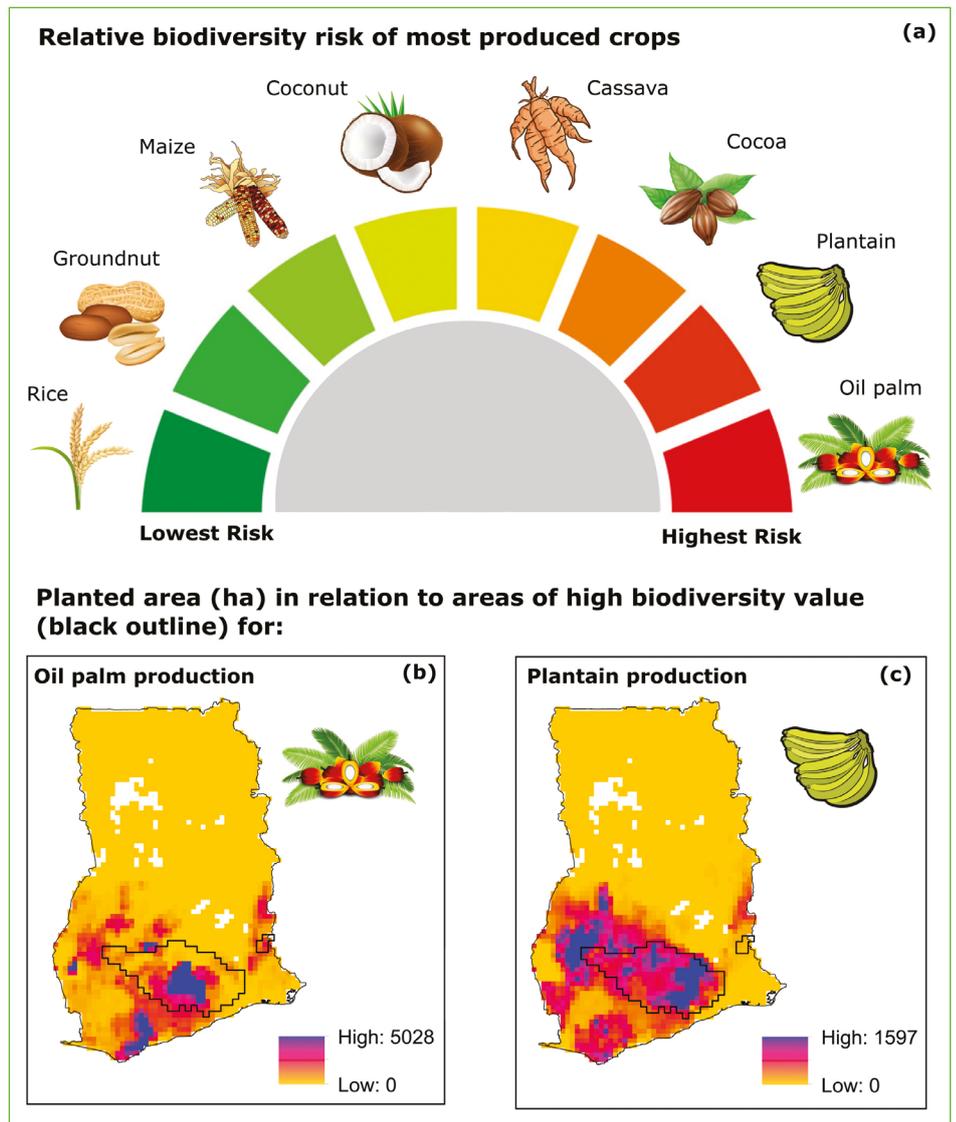
- **Agriculture-biodiversity trade-off risk:** meeting agricultural production needs puts biodiversity conservation at risk and vice versa. For example, a farmer expanding their cropland may encroach on pristine forests and put biodiversity at risk. A socioeconomic-focused goal is met by increasing production, but a conservation-focused goal is compromised. All agricultural production harms biodiversity to some extent, but farmers can reduce this impact by avoiding production in areas of high biodiversity value and using biodiversity-friendly farming practices.
- **High biodiversity value area:** a region with the top 10% of species in the country by area.
- **Ecosystem services:** the benefits that humans derive from ecosystems. Ecosystem processes, such as pollination, support ecosystem services, in particular the production of crops. In combination with human activities including cultivation, harvesting, transport, and land preparation, ecosystem services produce goods, for example flour, that humans value.
- **Biodiversity:** the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.⁵
- **Vertebrate biodiversity:** this research focused on vertebrate biodiversity on land only, which is the variety of life in groups of birds, mammals, reptiles and amphibians.

organisations (NGOs), such as the Nature Conservation Research Centre (NCRC) and Arocha Ghana.



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Figure 1. The relative biodiversity-agriculture trade-off risk, identified as the spatial overlap between areas of high biodiversity value and areas of crop production in Ghana. (a) The highest production volume crops [tonnes in 2020]⁴ in terms of the relative risk to biodiversity. The planted areas of oil palm and plantain overlap with high biodiversity value areas to the greatest extent and pose the most significant threat to biodiversity in Ghana. The planted area (ha) per 10 km² of these two crops in relation to Ghana's high biodiversity value areas (black outline) are shown in (b) and (c), respectively.



High biodiversity value areas in Ghana

In Ghana, the areas of highest biodiversity value are in the southwest of the country, which include 'hot spots' in the wet evergreen forest in the high forest zone.⁶ These areas are of high value because they support the highest number of species in the country.

Ghana supports endemic and threatened wildlife species, including a diverse array of amphibian, reptile, bird and mammal species. Threatened species of wild animals occurring in Ghana include the iconic African elephant (*Loxodonta africana*), the leopard (*Panthera pardus*) and the giant pangolin (*Manis gigantia*).⁶

Conclusion

Ghana's ecosystems support biodiversity and ecosystem services are essential for maintaining healthy and sustainable food systems. Agriculture threatens ecosystems in Ghana that are crucial for biodiversity. Policymakers should prioritise agricultural expansion in areas outside of Ghana's high biodiversity value areas, so that food production can continue into perpetuity without degrading the biodiversity and ecosystem services on which it depends.

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About this briefing

This policy briefing describes the risk of agricultural production to biodiversity in Zambia. It is aimed at policymakers in agriculture, environment, and planning.

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Publisher:

Sentinel/International Institute for Environment and Development
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Funding:

Sentinel is funded by UK Research & Innovation (UKRI) through the Global Challenges Research Fund (GCRF) programme for 'Growing research capability to meet the challenges faced by developing countries' ('GROW'). Grant Ref: ES/P011306/1. However, the contents of this document are the sole responsibility of the authors and do not necessarily reflect the position of our funders.