

# Integrating Biodiversity Objectives in Future Cropland Expansion and Intensification in Tanzania

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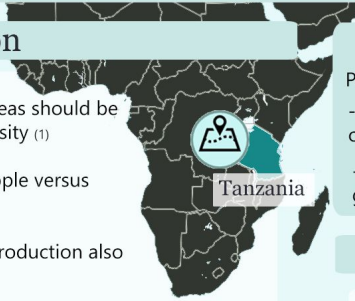




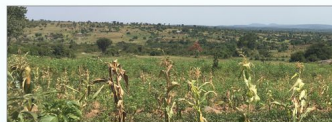
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## Introduction

- Global biodiversity framework: Agricultural areas should be managed through sustainable use of biodiversity (1)
- Trade-offs in land uses: Biomass needs of people versus ecosystems and biodiversity protection (2, 3)
- Land scarcity: Areas suitable for agricultural production also valuable for biodiversity conservation (4, 5)
- Tanzania:**
  - Hosts 6 of 25 global biodiversity hotspots (6)
  - ~ 8 million households engaged in agriculture, mostly rainfed and small-scale (7)
  - High potential for agricultural intensification and high ongoing agricultural expansion (8)



Zebu and cattle, Lake Manyara



Agricultural land, Serengeti district

## Lessons Learned

Policy measures could be implemented to:

- Enhance agricultural management, perceived to pose challenges but also opportunities for most participants
- Maintain biodiversity when intensifying agricultural crop production, as this could generate synergetic benefits

## Methods

- 72 responses expert questionnaires:



- 17 Follow-up interviews

- Inductive coding and descriptive statistics

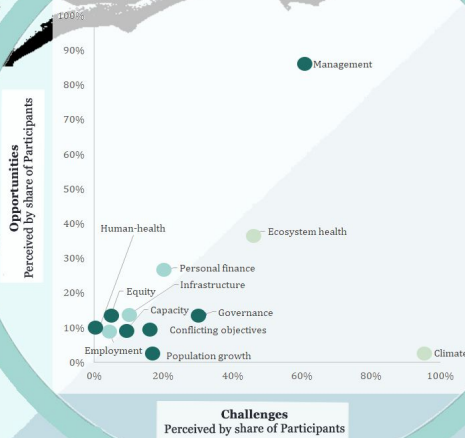
## Research Questions

1. What are the major challenges and opportunities to align biodiversity conservation and increased crop production in Tanzania?

2. To what extent can current cropland be expanded, or current cropland use be intensified if biodiversity objectives are considered compared to disregarded?

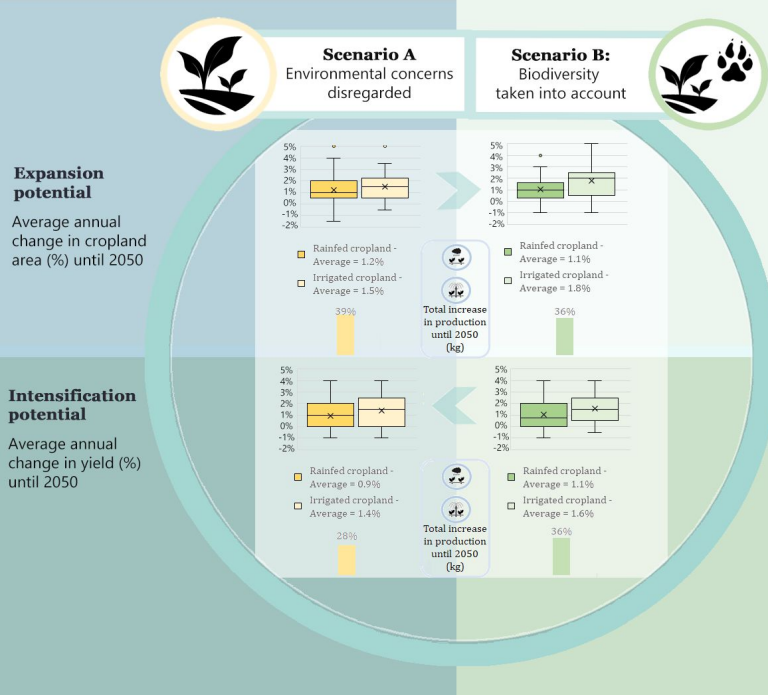
## Results

### Opportunities and Challenges



"If you think more about how you **manage** your land...Biodiversity does not need per se to decrease...I believe that **sustainable farming practices** could do a lot more to **improve biodiversity**..."

Interview quote, Agricultural Expert, Tanzania, August 2022



"If environmental concerns are disregarded, it [the yield] will increase, but not so much. Why not so much? It [the yield increase] will be short-lived, two, three years and then it will crash."

Interview quote, Biodiversity Expert, Tanzania, August 2022

## Way forward

- Co-redesign scenarios with stakeholder workshops/interviews
- Simulate impacts on the Tanzanian economy in IFPRI's standard CGE model (9)

## References

1. The Convention on Biological Diversity. (2022). Official CBD Press Release - 19 December 2022, Montreal. 2. IPBES (2018) The IPBES regional assessment report on biodiversity and ecosystem services for Africa. 3. Seppelt et al., (2016). Harmonizing biodiversity conservation and productivity in the context of increasing demands on landscapes. *BioScience*, 66(10), 890-896. 4. Zabel et al., (2019). Global impacts of future cropland expansion and intensification on agricultural markets and biodiversity. *Nature communications*, 10(1), 1-10. 5. Kehoe et al., (2017). Biodiversity at risk under future cropland expansion and intensification. *Nature ecology & evolution*, 1(8), 1129-1135. 6. CBD. (2021) United Republic of Tanzania - Main Details. 7. The United Republic of Tanzania. (2021). National Report. National sample census of agriculture 2019/20 8. Mkonda and He, (2018). Agricultural history nexus food security and policy framework in Tanzania. *Agriculture & Food Security*, 7(1), 1-11. 7. 9. Lofgren et al., (2002). A standard computable general equilibrium (CGE) model in GAMS (Vol. 5). Intl Food Policy.