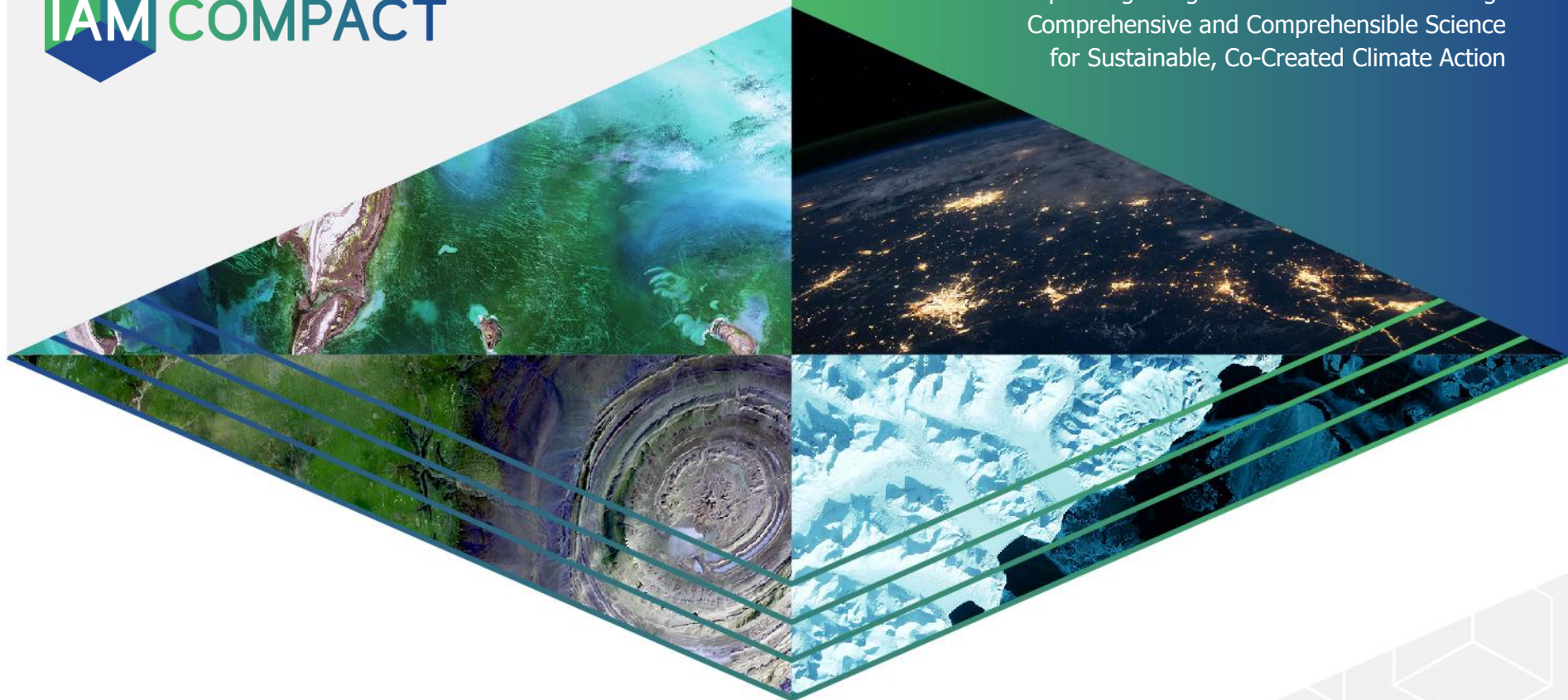




Expanding Integrated Assessment Modelling:
Comprehensive and Comprehensible Science
for Sustainable, Co-Created Climate Action



Responsive science in support of climate policymaking
IAM COMPACT Final Conference, Athens, 29 August 2025

Whole-systems analysis amid polycrisis: Ethiopia

Camilla Lo Giudice, KTH Royal Institute of Technology



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Limited access to essential services

less than 10% benefiting from basic sanitation
43% of the population does not have access to an improved water source

Limited energy access

51% of the population connected to electricity
9% having access to clean cooking facilities

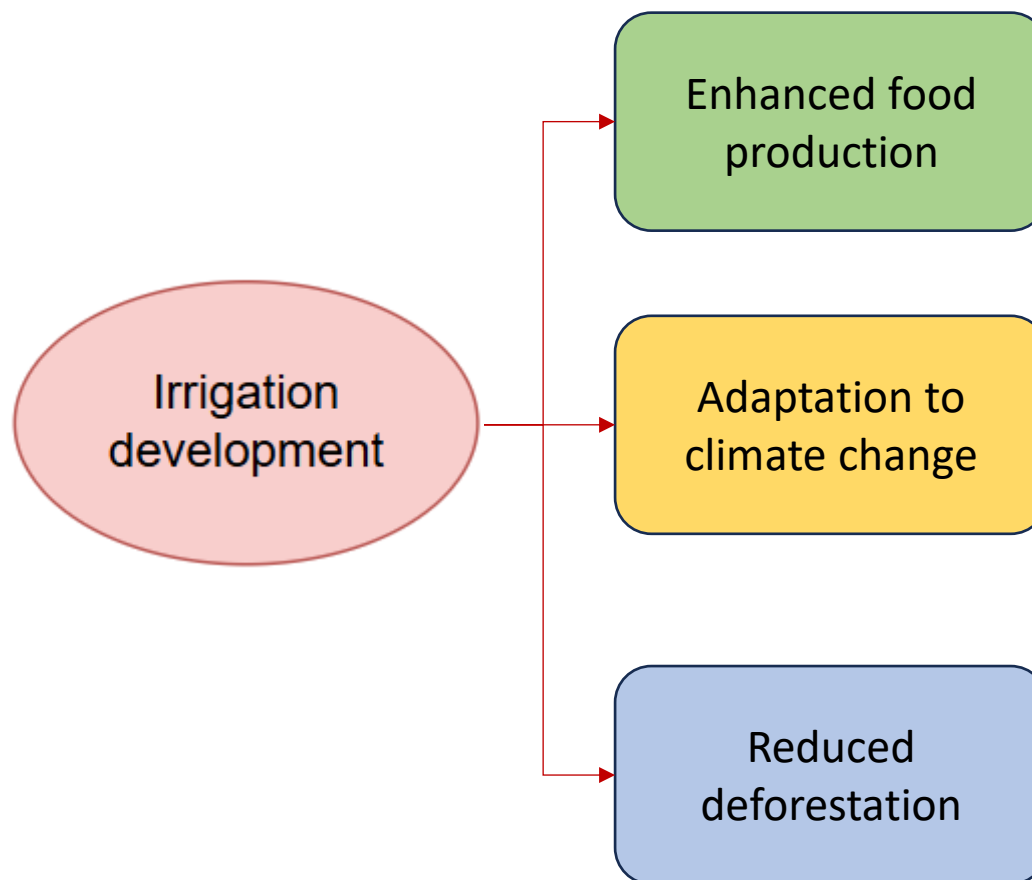
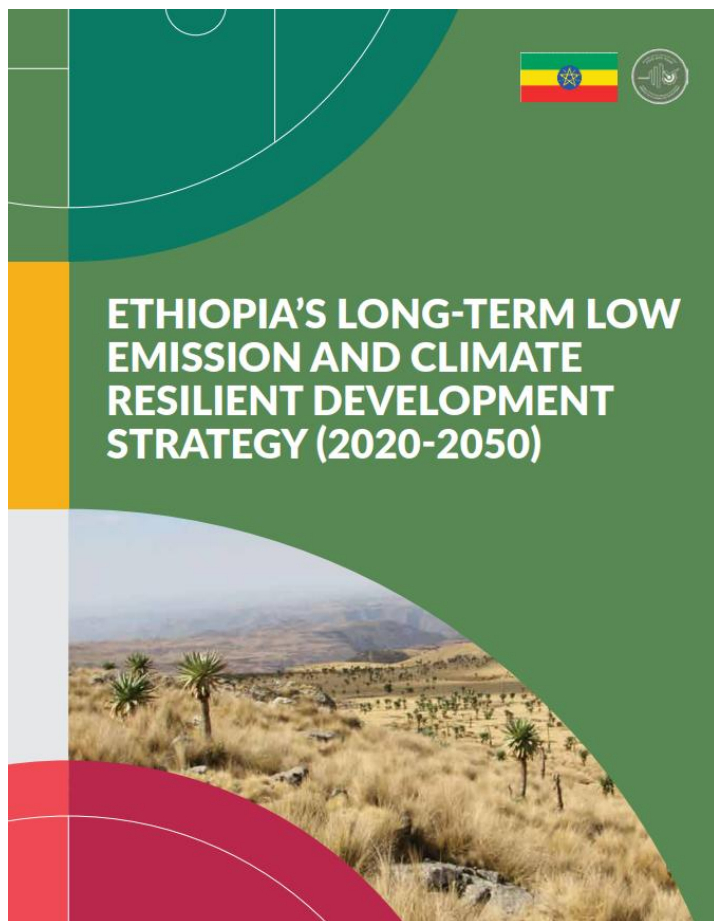


Food insecurity

15.8 million people are expected to experience hunger in 2024

Vulnerable to climate change

Droughts, floods, and soil degradation, threaten its predominantly rain-fed agricultural sector that supports 85% of its farmers





Whole-system analysis with the CLEWs framework

Climate

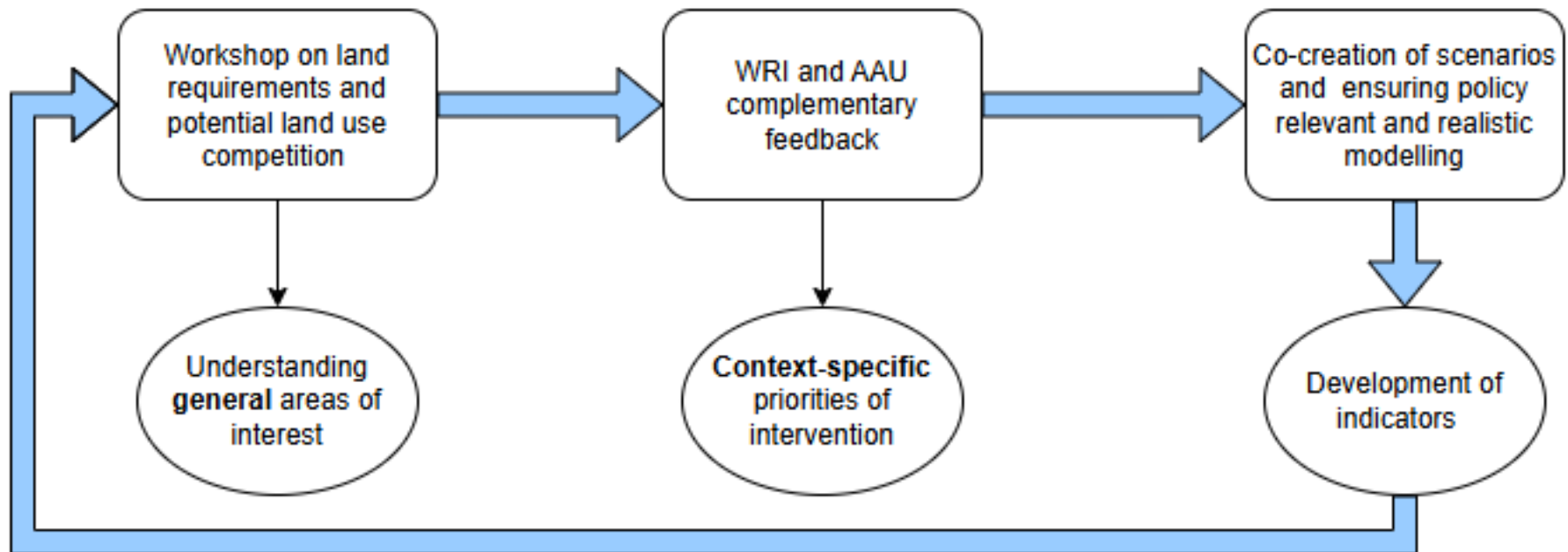
Land

Energy

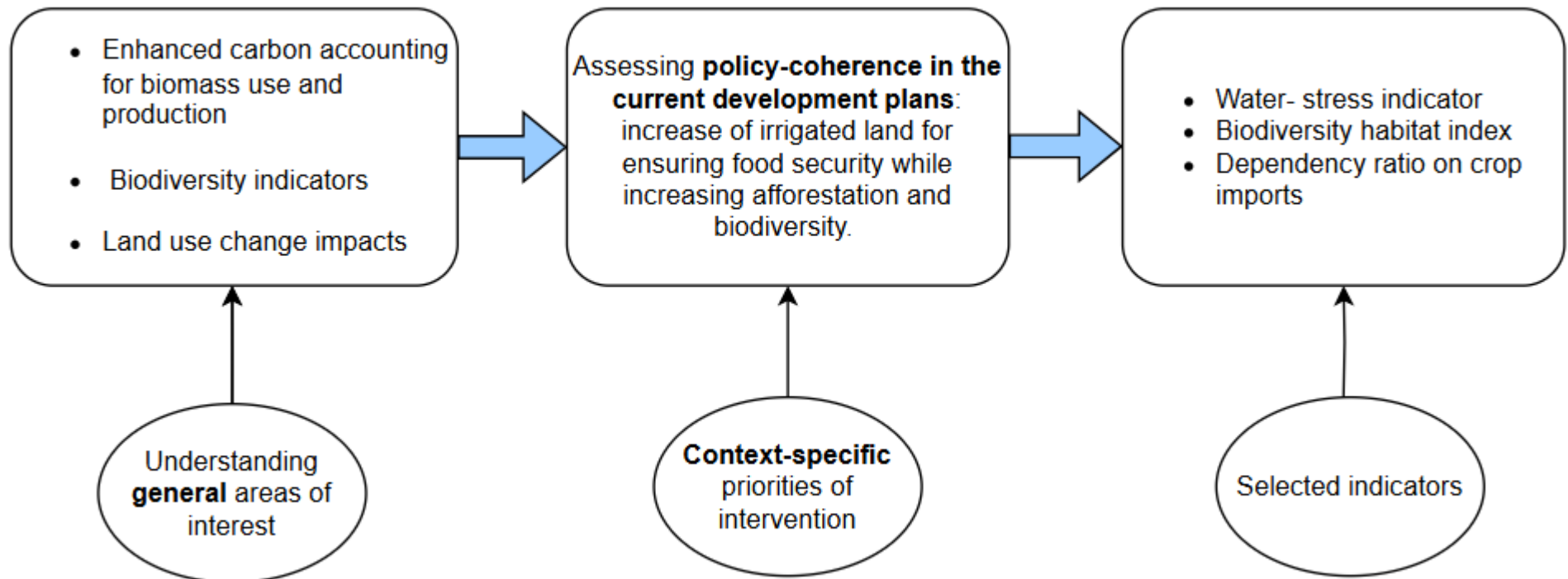
Water



Priorities of intervention and co-creation of scenarios



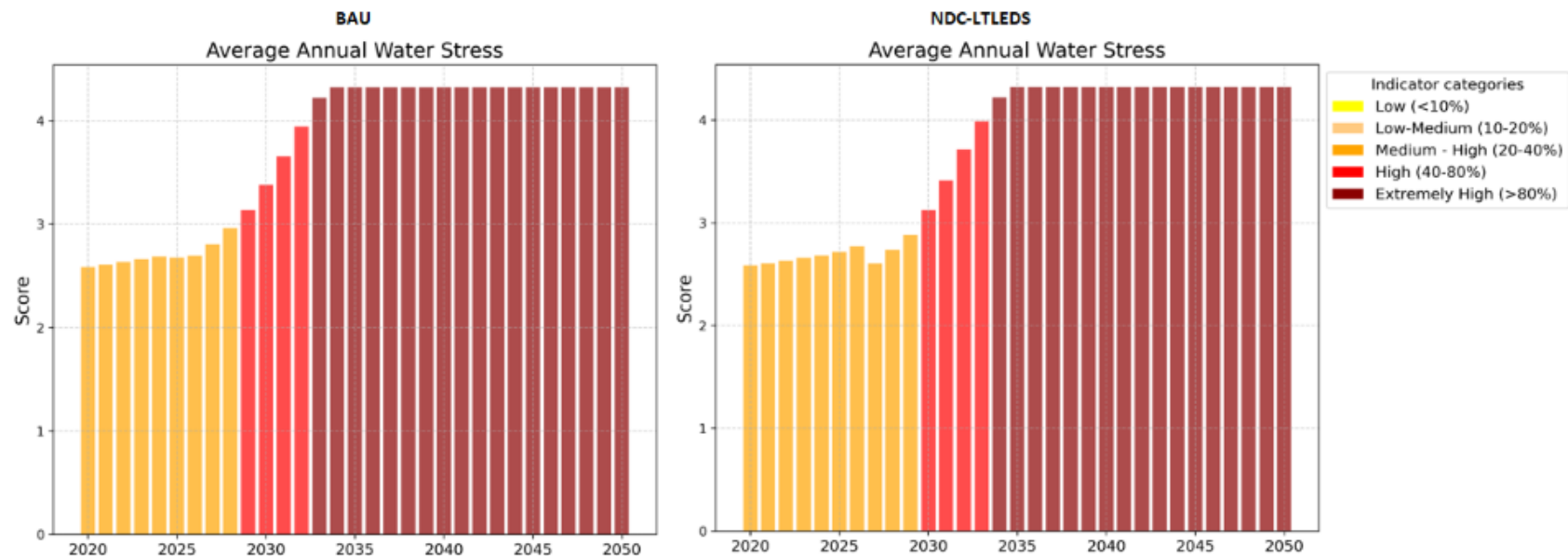
Priorities of intervention and co-creation of scenarios



Scenario	Description
BAU – Business as usual	This scenario can be considered as a baseline needed for the comparison with the NDC-LTLEDS scenario. It represents the optimal least cost solution if the current policies are in place.
NDC-LTLEDS	This scenario is based on the implementation of the current stated policies and targets presented in the updated national determined contribution and Ethiopia's long-term low-emission and climate resilient development strategy (2020-2050). See the table below for the targets.



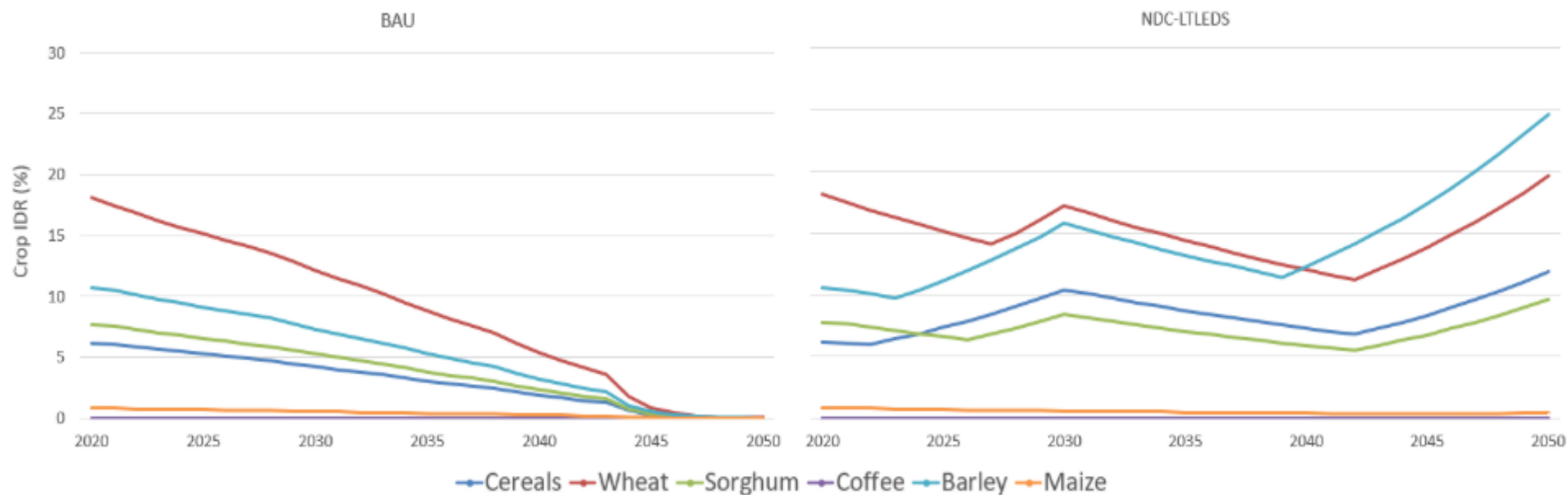
Water stress



$$\text{Water stress} = \frac{\text{Total Gross Demand}}{\text{Total Supply}}$$



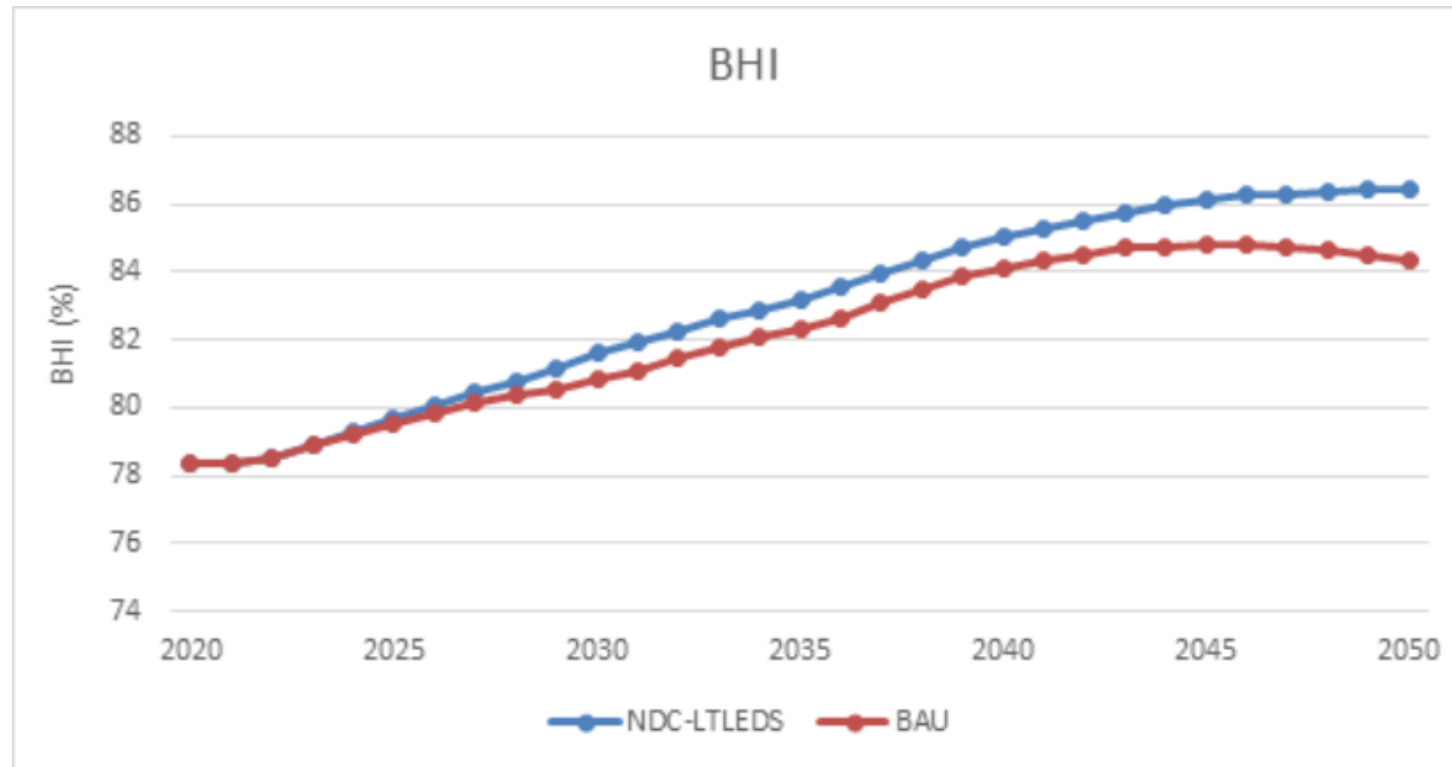
Crop Import Dependency Ratio (IDR)



$$\text{Crop IDR} = \frac{\text{Total Annual Imports}}{\text{Total annual demand}}$$



Biodiversity Habitat Index (IDR)



$$BHI = \frac{\text{Forest area retained}^{0.25}}{\text{Original Forest Area}} \quad (\text{Ferrier et al., 2004})$$



Conslusions and key takeways

- Need for **integrated analysis** to ensure policy coherence and sustainable use of resources.
- Importance of understanding synergies and trade-offs within the nexus.
- **Promote the Africa- EU partnership.**
- **Foster cooperation and dialogue** between stakeholders, policy makers, institutions and academia.





Thank you!

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