



# Multiple scales

KB-35-005

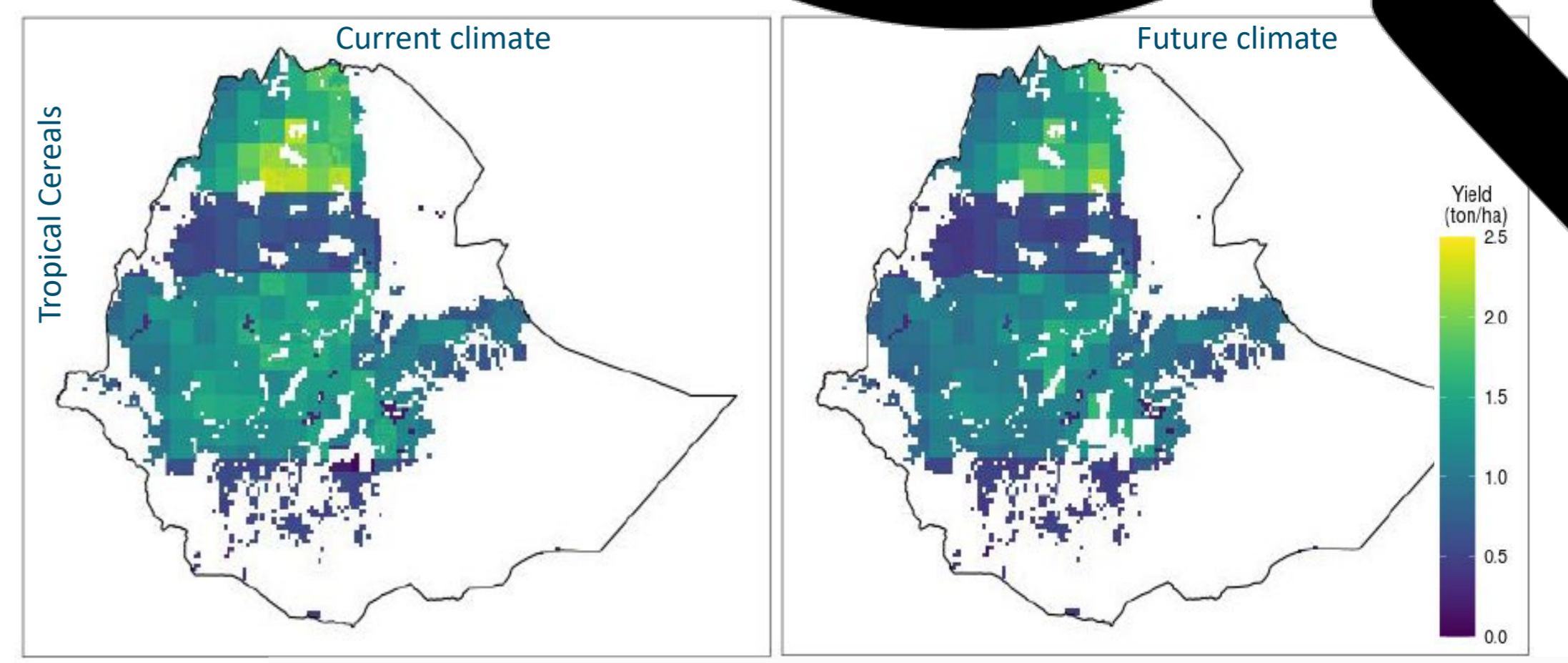
2019-2022

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## Objectives and methods

We use several models to provide an integrated assessment of food systems across multiple scales. With these models we cover economic, demographic, agriculture, energy, land- and water-use components of the food system and include the effects of climate change. We use these models both in explorative and normative (goal-seeking) scenario studies. Case studies focus on Ethiopia and South Asia.

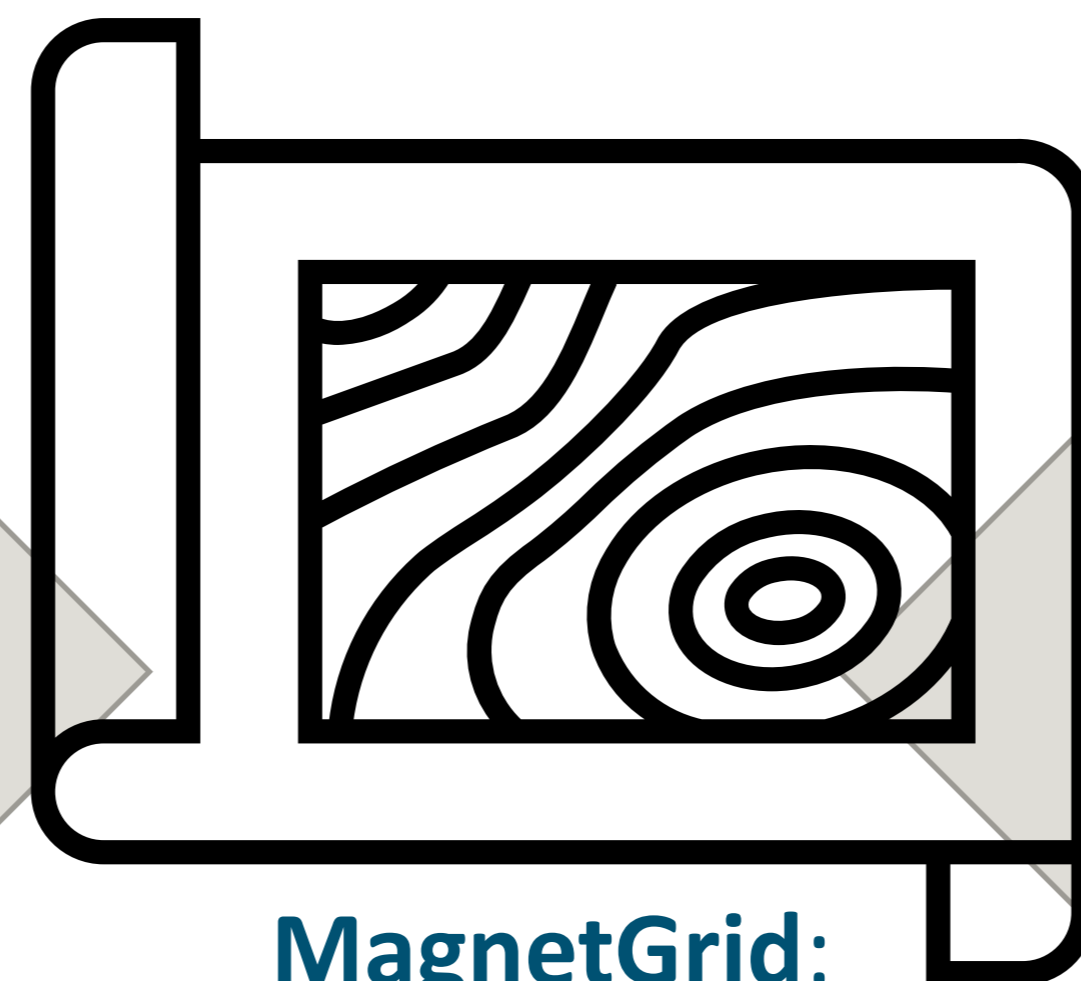


LPJml simulation for tropical cereal yield in Ethiopia under current climate and future climate conditions

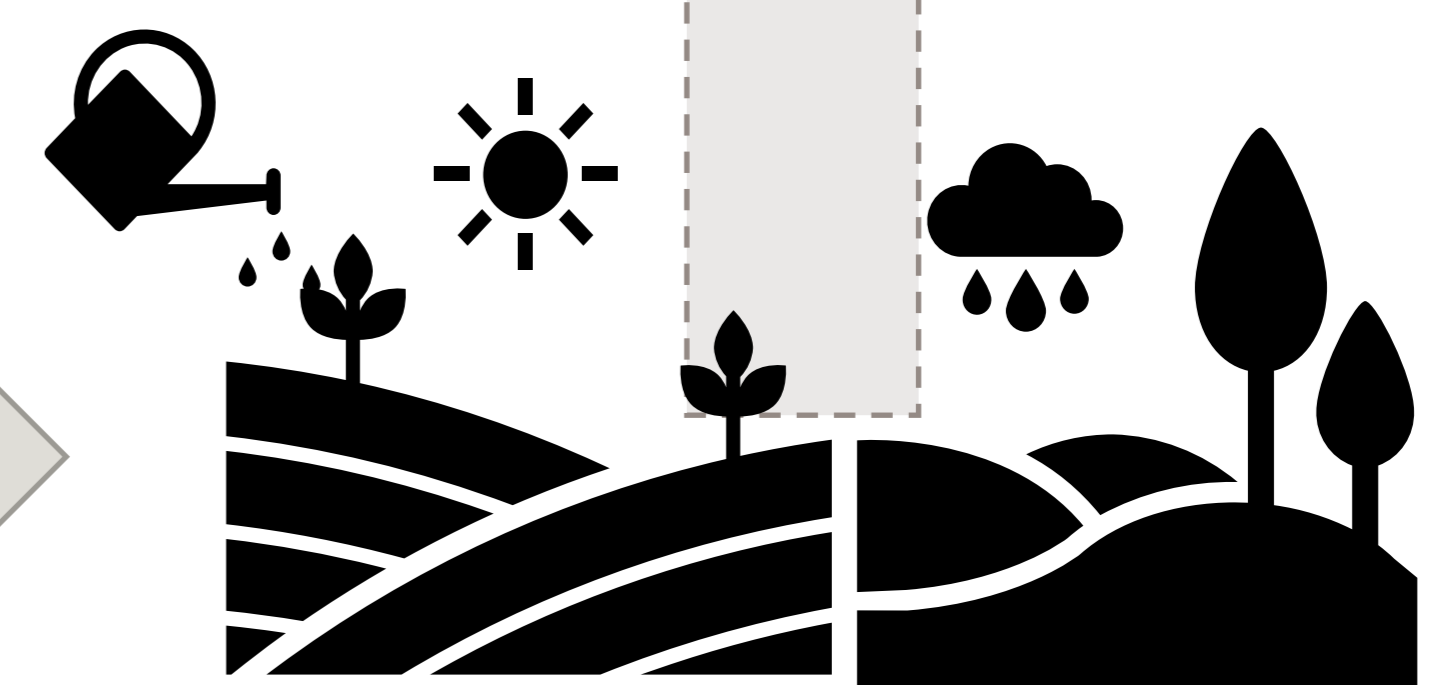
## Modelling framework



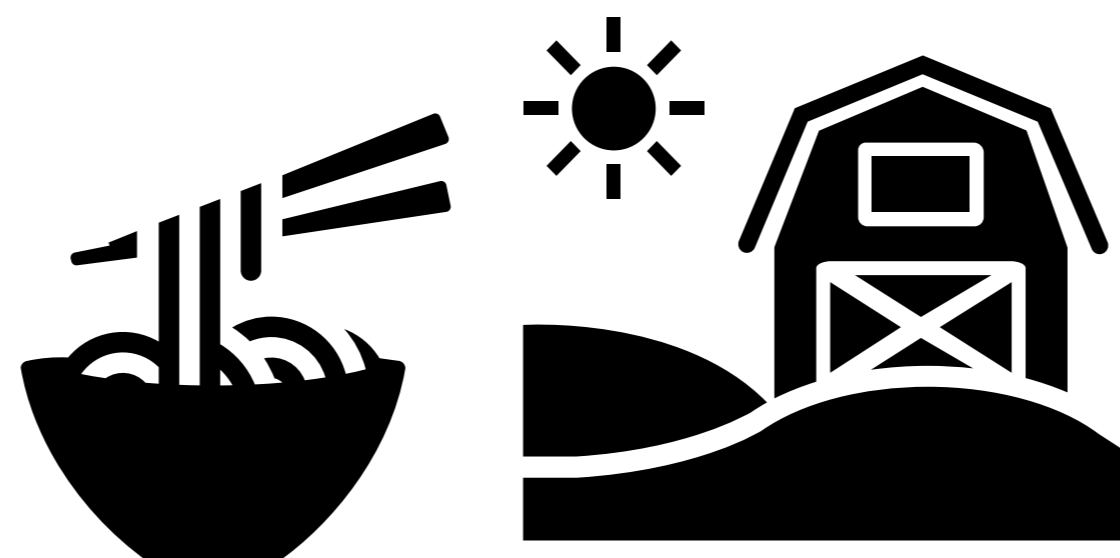
**Magnet: Global Bioeconomy**



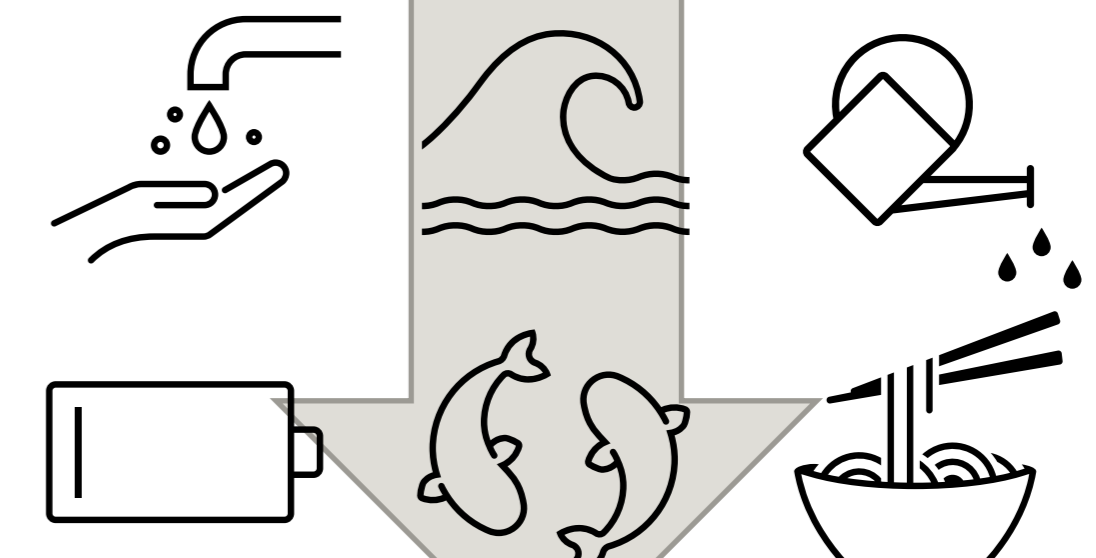
**MagnetGrid: Land-allocation**



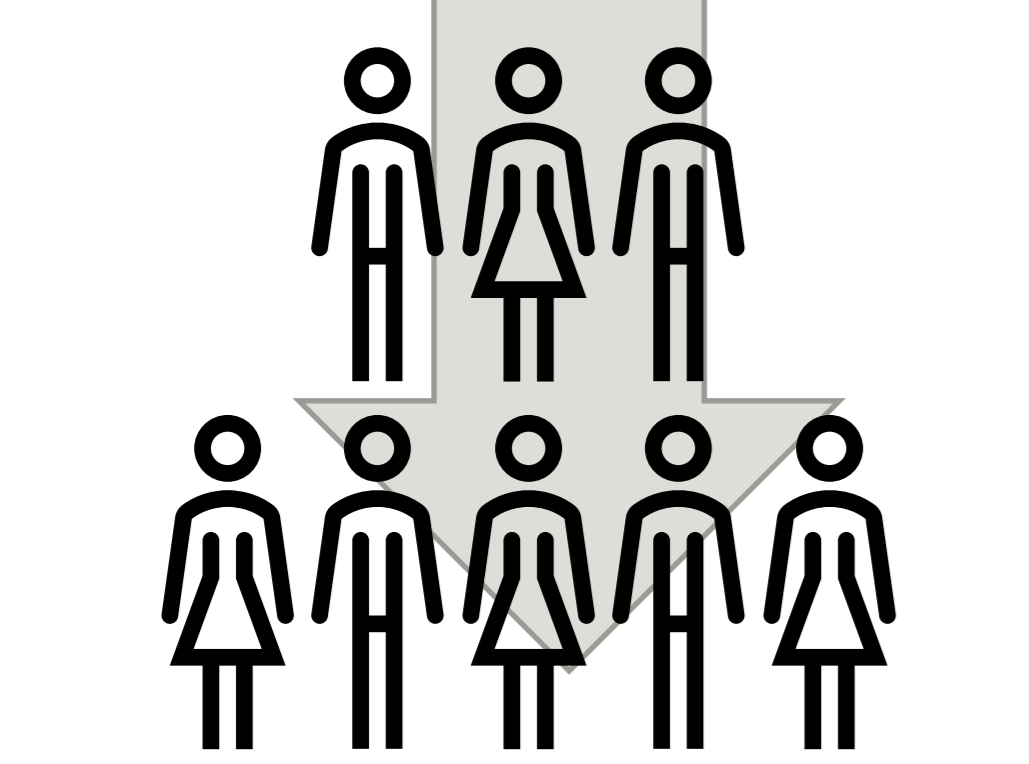
**LPJml: landuse, carbon, (nitrogen), waterflow**



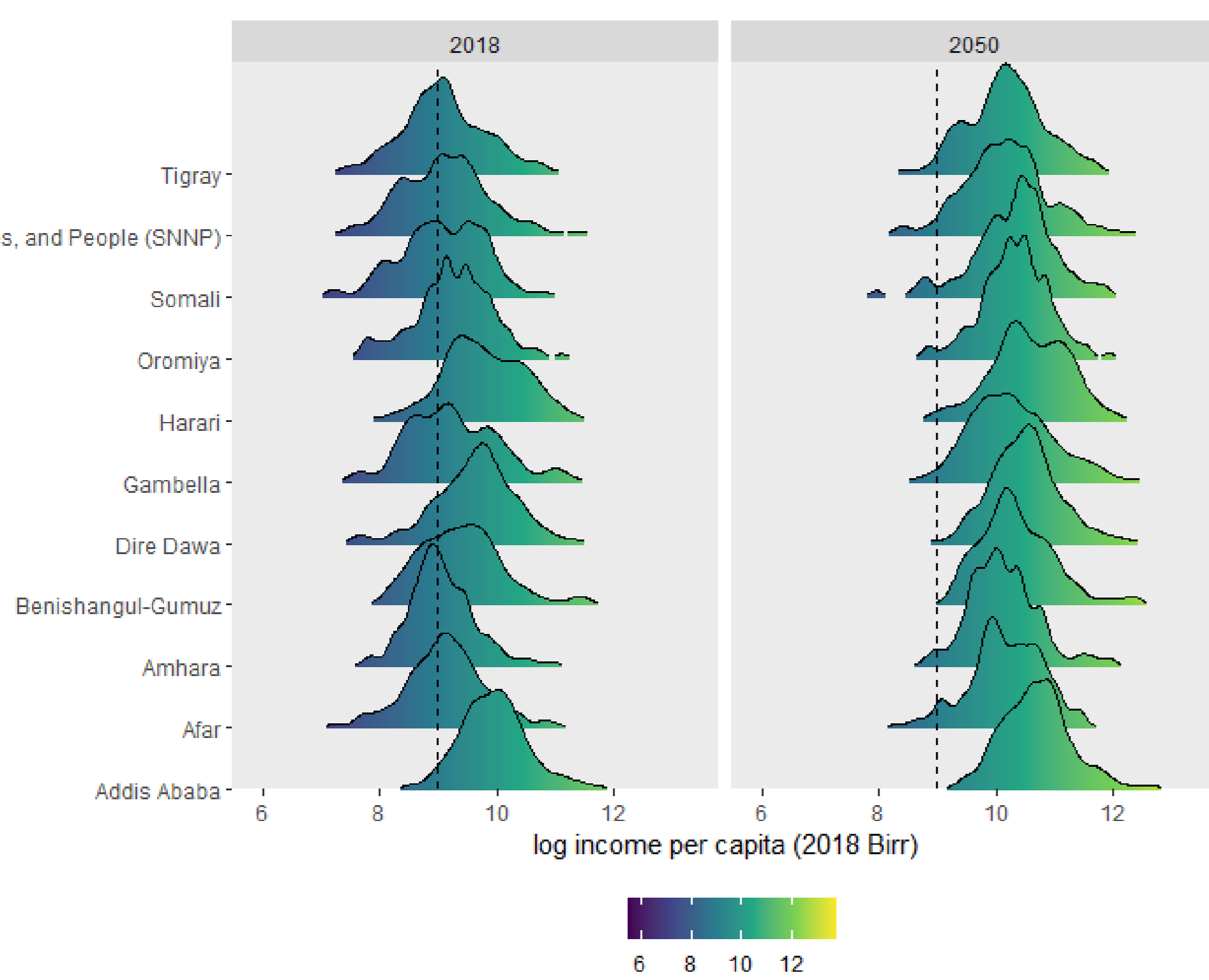
**BIOSPACS: matching consumption with production, calculating emissions, resource use**



**Waterwise: balancing allocation of water to energy, food, ecology**



**Microsimulation of demography & income**



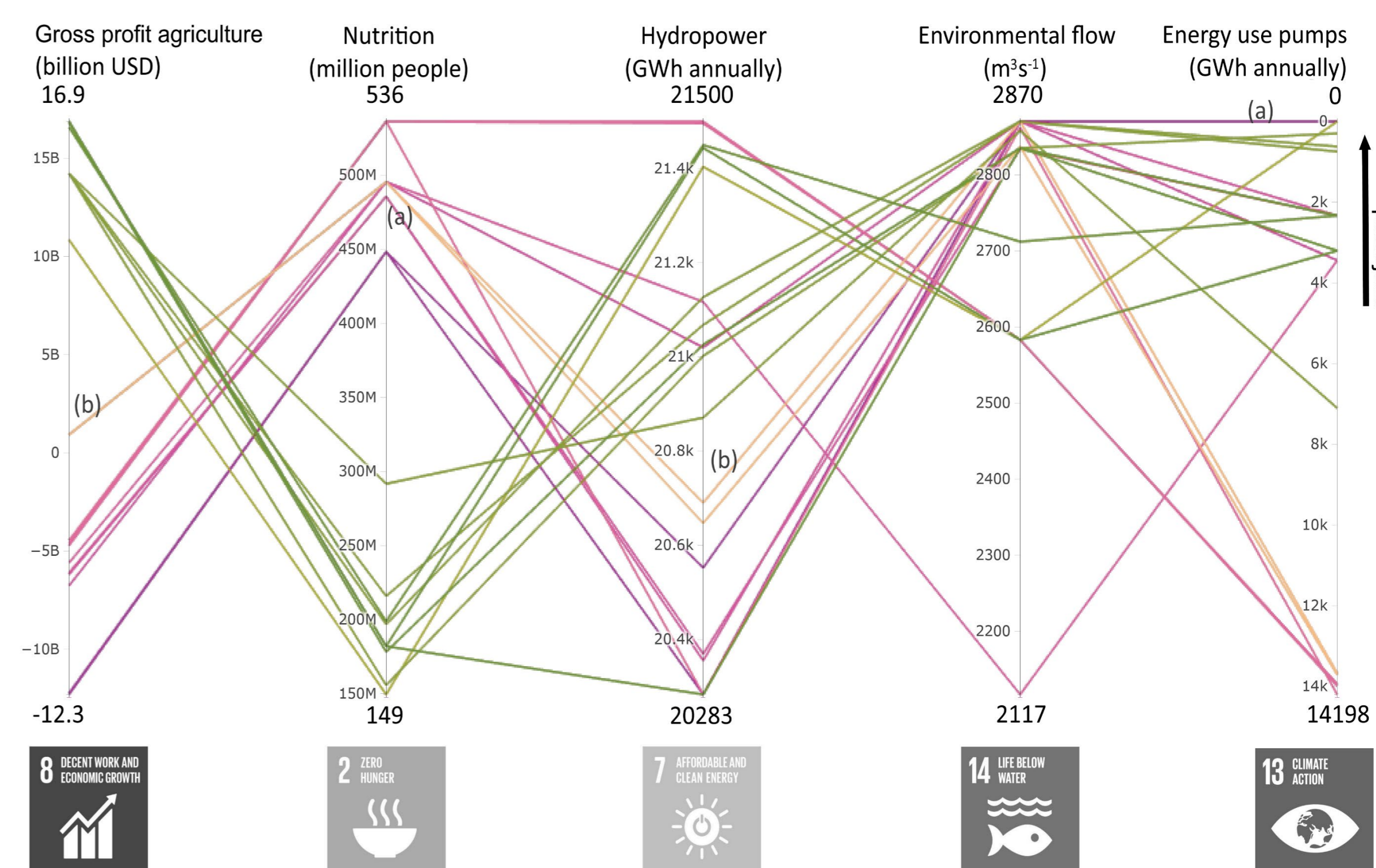
Simulated development of per capita income distribution in Ethiopian regions from 2018 to 2050

## And more...

- Upscaling local practices to regional impact
- Identify options to optimise national diets
- ...

## Future developments

- Refine methodologies
- Include rural/urban processes
- Improve data assimilation
- Link to animals/forestry/...



Visualisation of the trade-offs in reaching five different SDG indicators. These trade-offs occur when allocating water to meet specific demands. Each line represents a possible combination, with colouring according to agricultural gross profit



## Question for audience

- How can we help you quantify across domains & scales?