

GTAP CONFERENCE 08.06.2022

Quantifying SDG Indicators for Multiple
SSPs up to 2050 with a Focus on
Selected Low and Low-middle Income
Countries and the Bio-economy
based on CGE Analysis

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BACKGROUND: INDICATOR COLLECTION AND RESEARCH GAP

SUSTAINABLE DEVELOPMENT GOALS



Literature

Official
indicator
framework

- 231 unique indicators assigned

➔ Research Gap: Household level detail + Detail in agriculture + SDG4, SDG5, SDG14 and SDG17

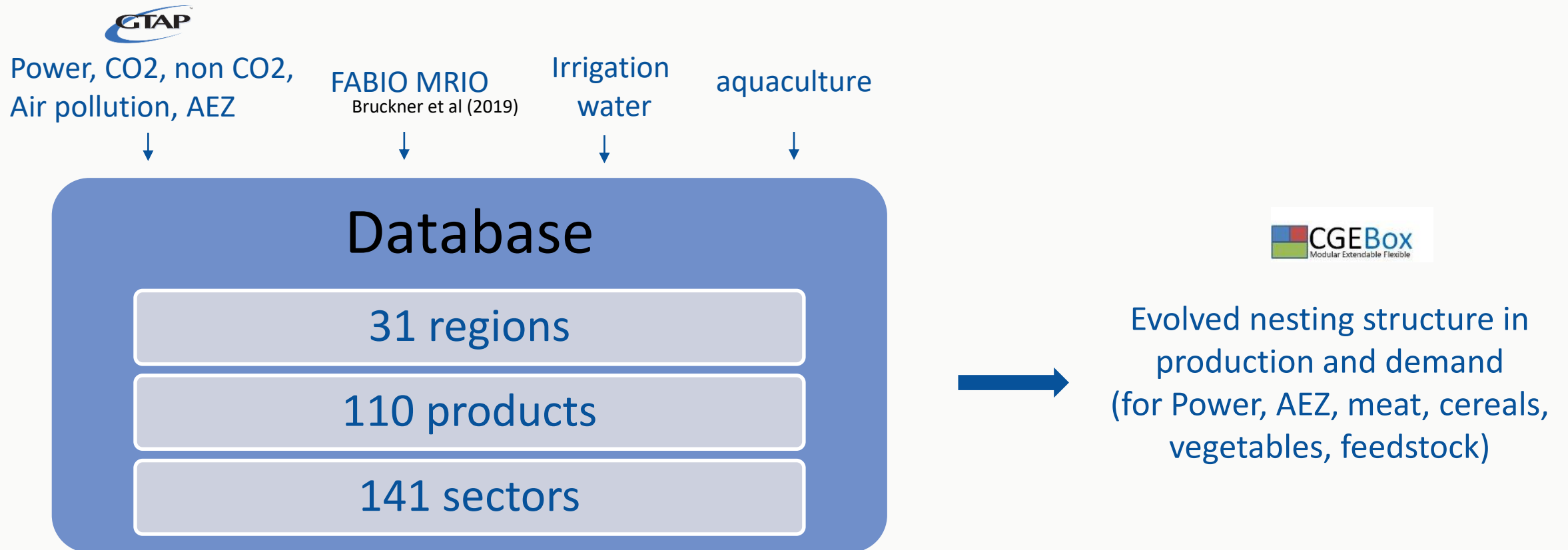
METHOD: INDICATOR IMPLEMENTATION



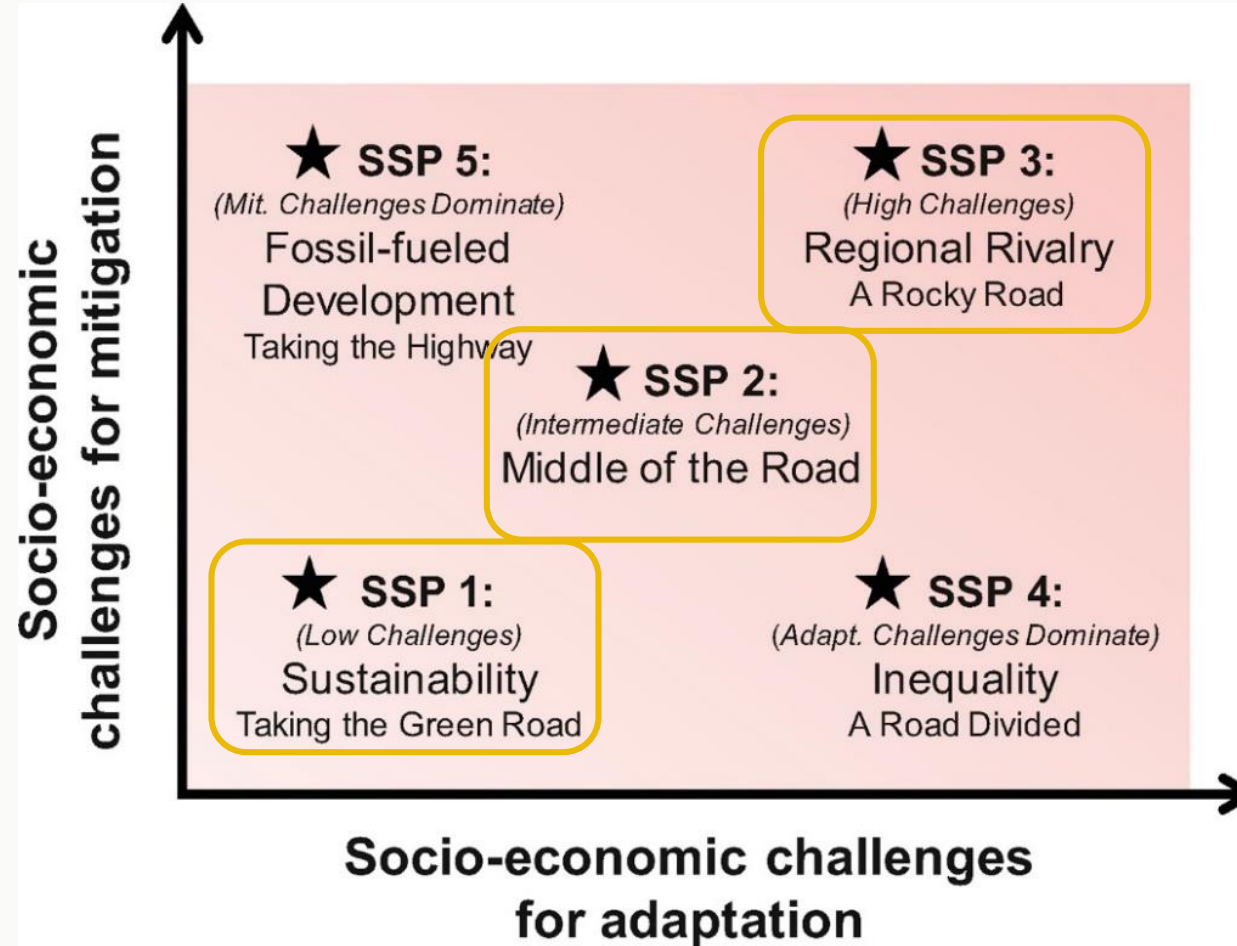
United Nation (NN)

METHOD: DATABASE AND MODEL FOR BASELINE GENERATION

- Implemented in CGEBox (Britz and van der Mensbrugghe, 2018)
- Includes data handling and splits



METHOD: STORYLINES IN BASELINE



METHOD: BASELINE GENERATION

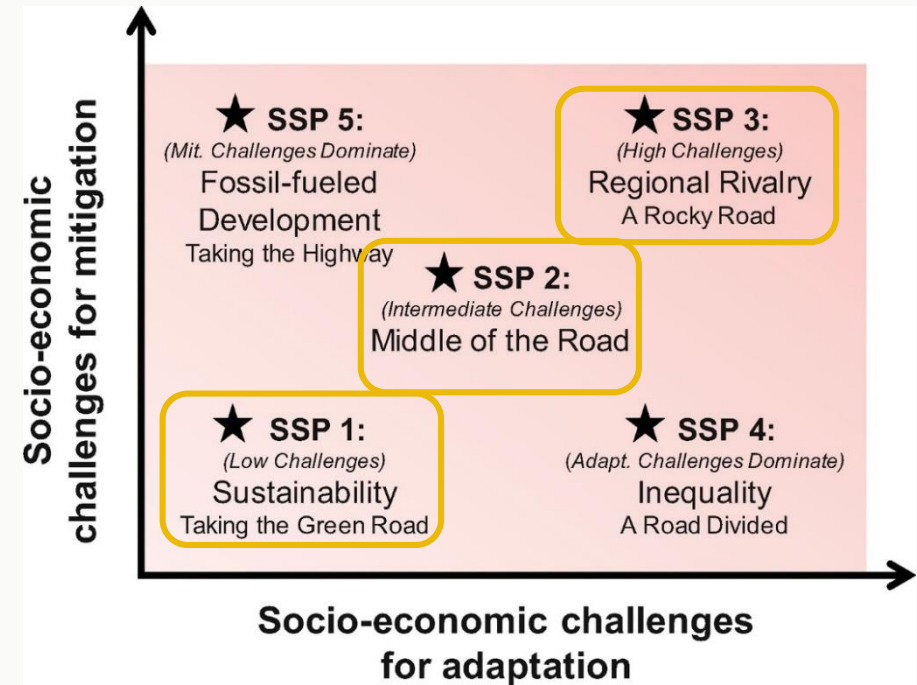
Macro-projections

- GDP per capita
- Demography
- Educational attainment
- Urbanization rate

G-RDEM: Long term baseline

- Differentiated total factor productivity growth
- MAIDADS: non-linear Engel curves
- Debt accumulation from foreign savings and trade imbalances
- Macro saving rates linked to population and income dynamics
- Income dependent industrial cost shares
- Crop yields and crop land forecasts from FAO (2018)

Britz and Roson (2019)

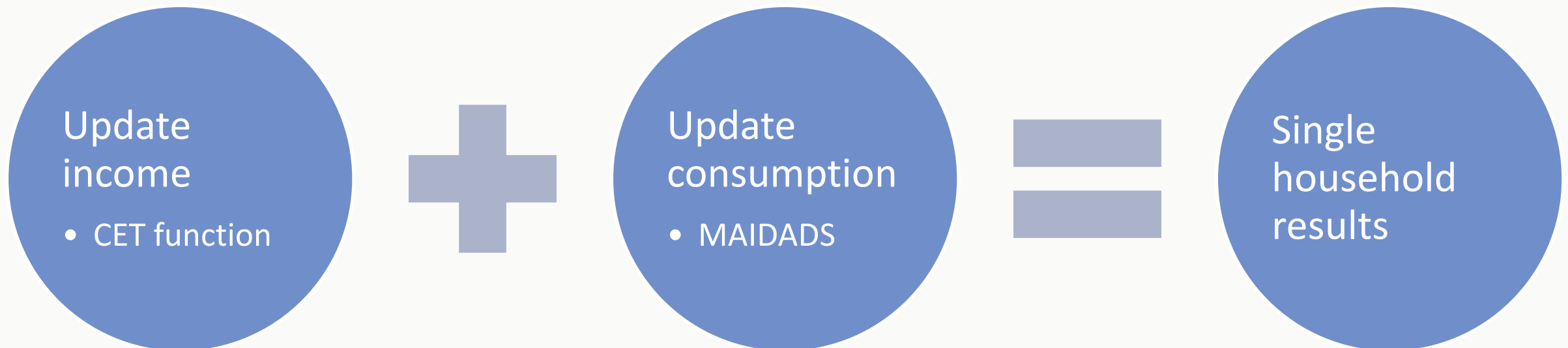


Scenario specific assumptions on

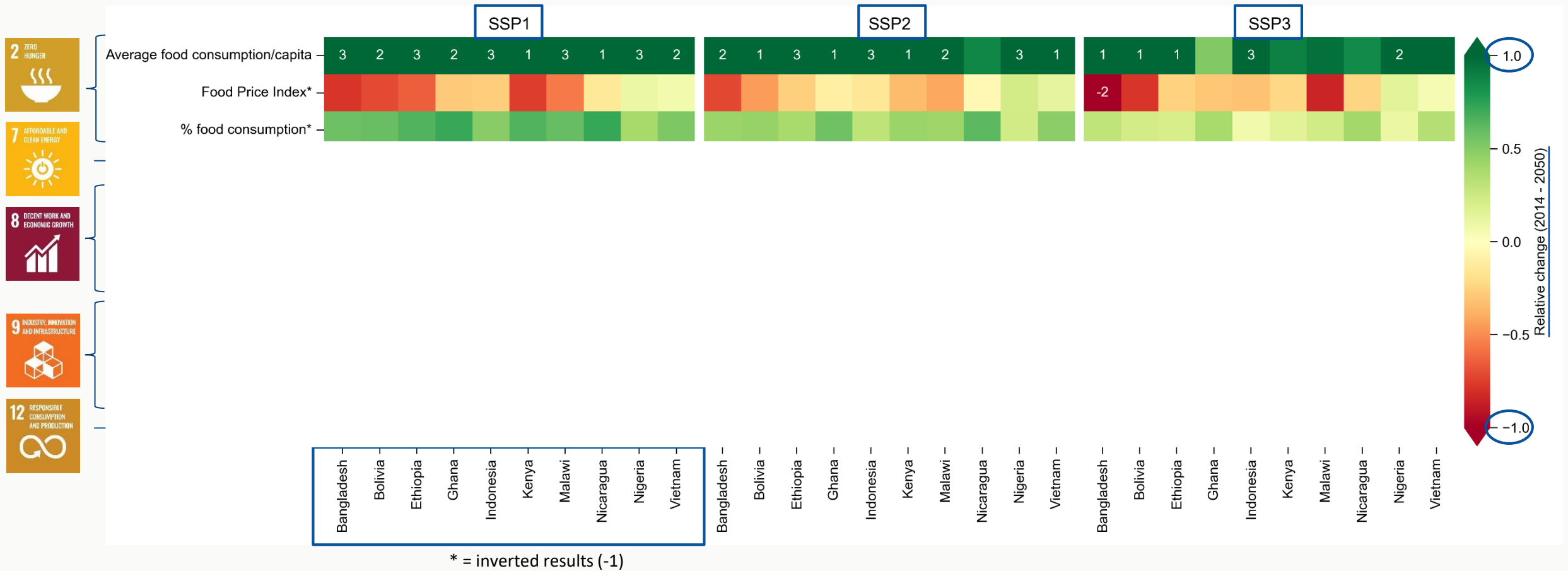
- CO₂ price 🌡️
- Meat consumption 💡
- and tariffs 🏠

METHOD: POST-MODEL MICROSIMULATION

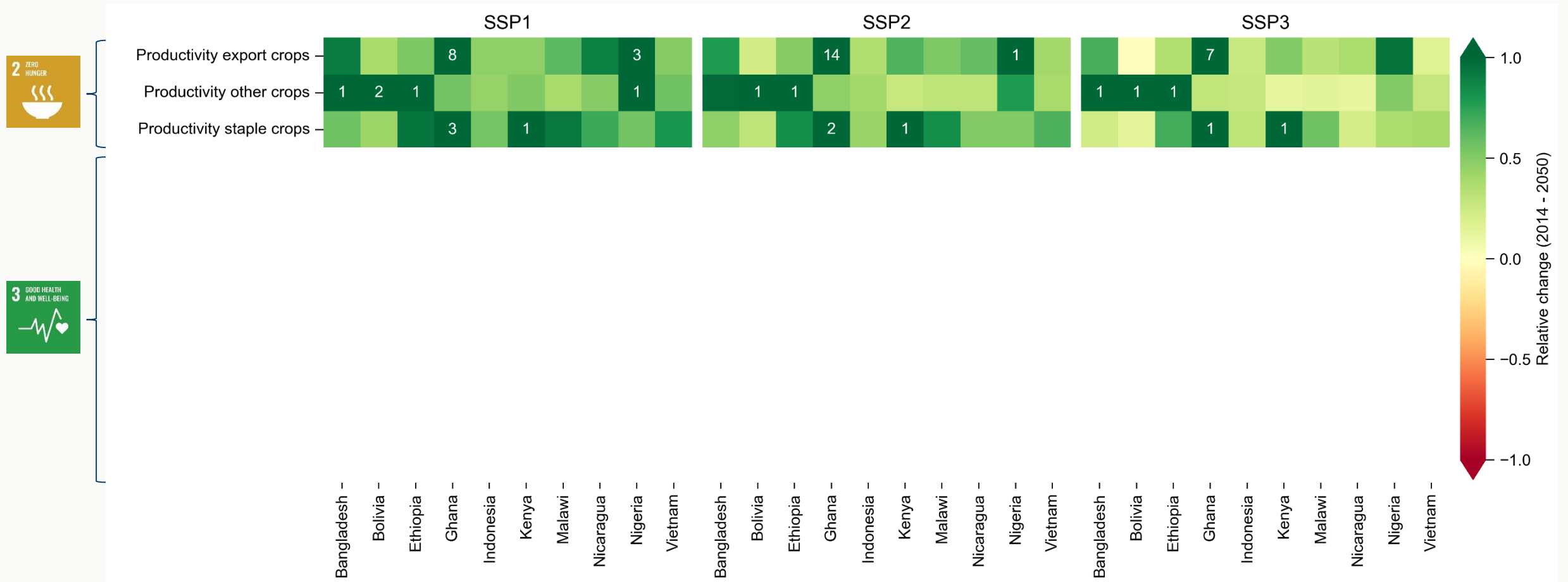
- Distributional effects: income, nutrition
- FAO household surveys for 10 low- and low middle-income countries
- Details on household income composition but not on consumption
- Summarized as 500 percentiles



RESULTS: BASED ON GTAP STANDARD MODEL FEATURES

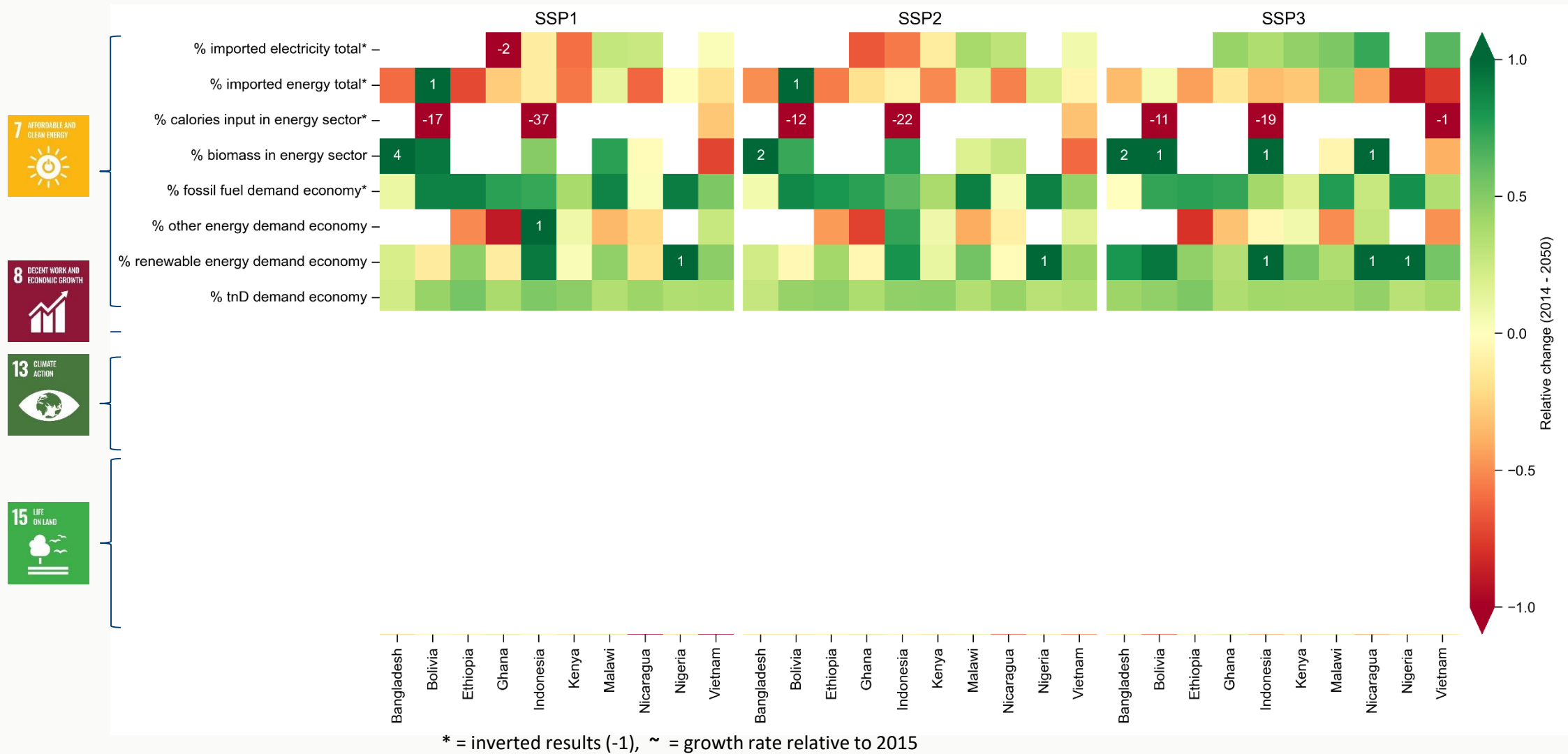


RESULTS: BASED ON AUXILIARY DATA AND RELATED EXTENSIONS 1

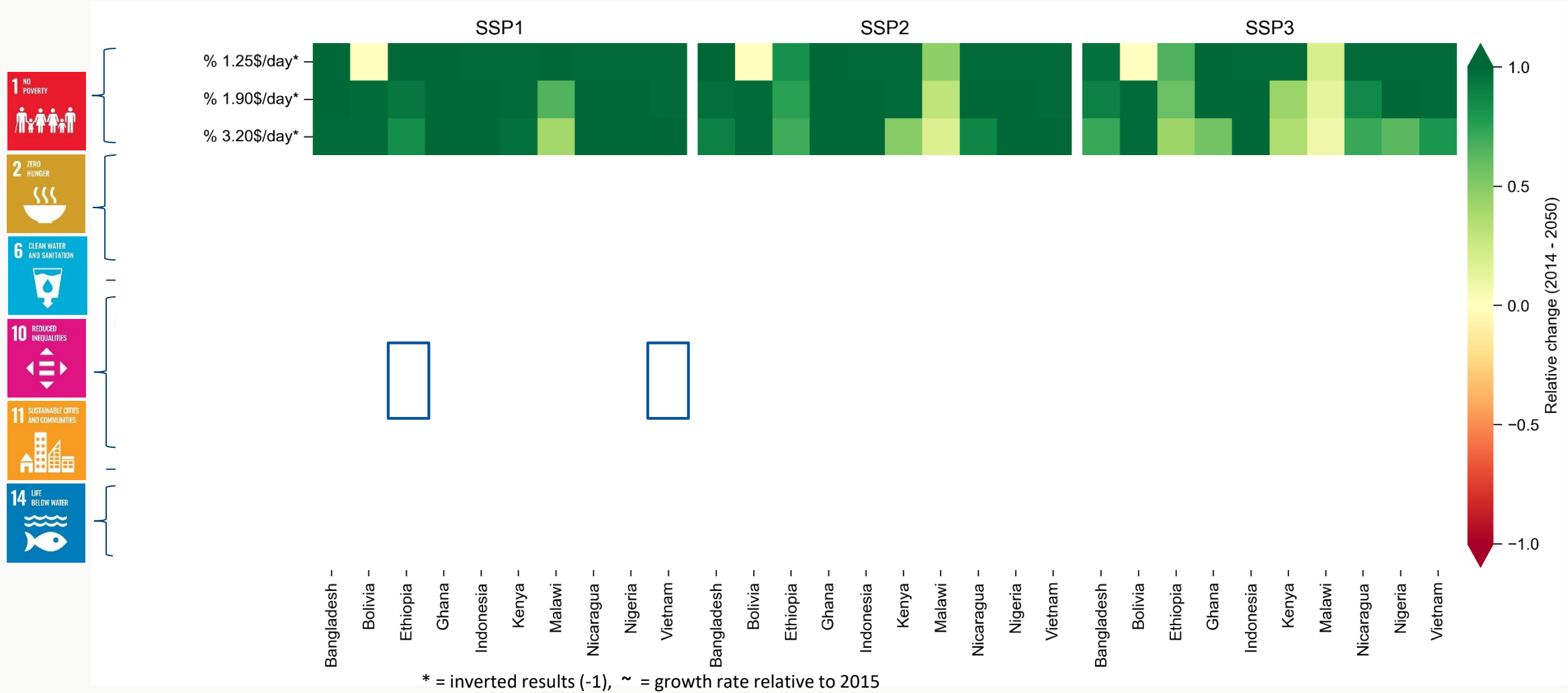


* = inverted results (-1)

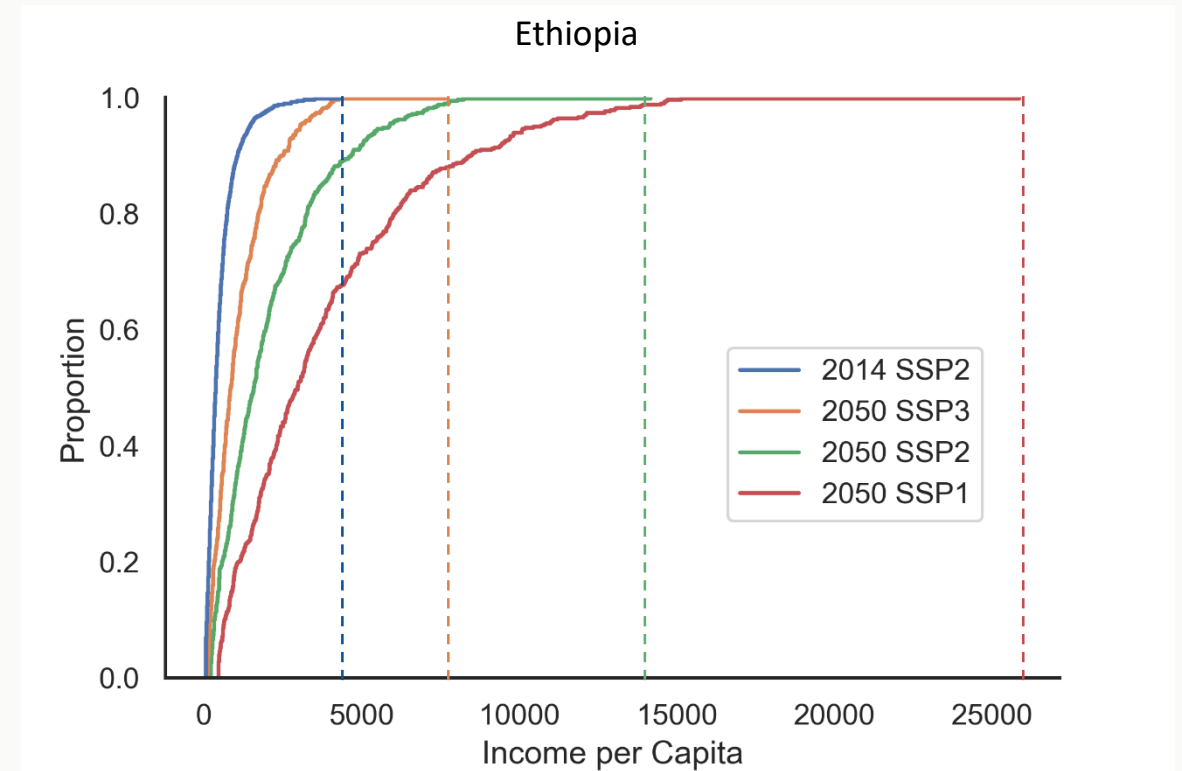
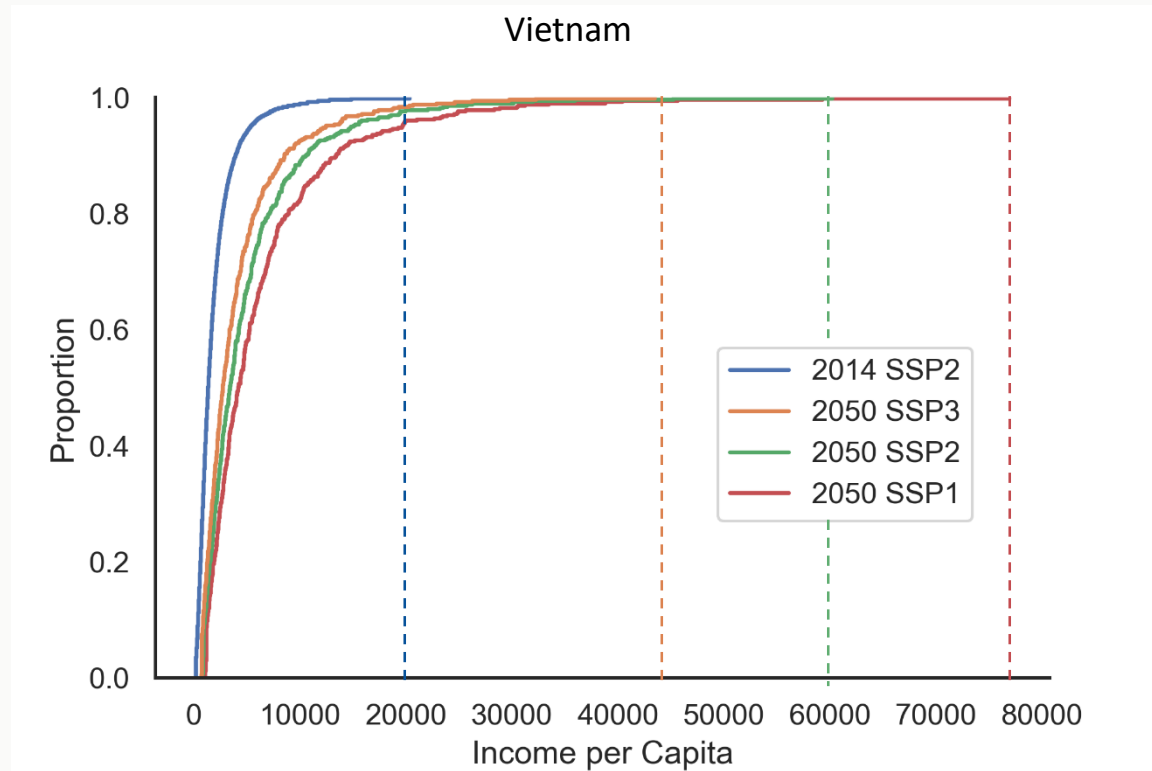
RESULTS: BASED ON AUXILIARY DATA AND RELATED EXTENSIONS 2



RESULTS: BASED ON NEW DATA AND RELATED EXTENSIONS

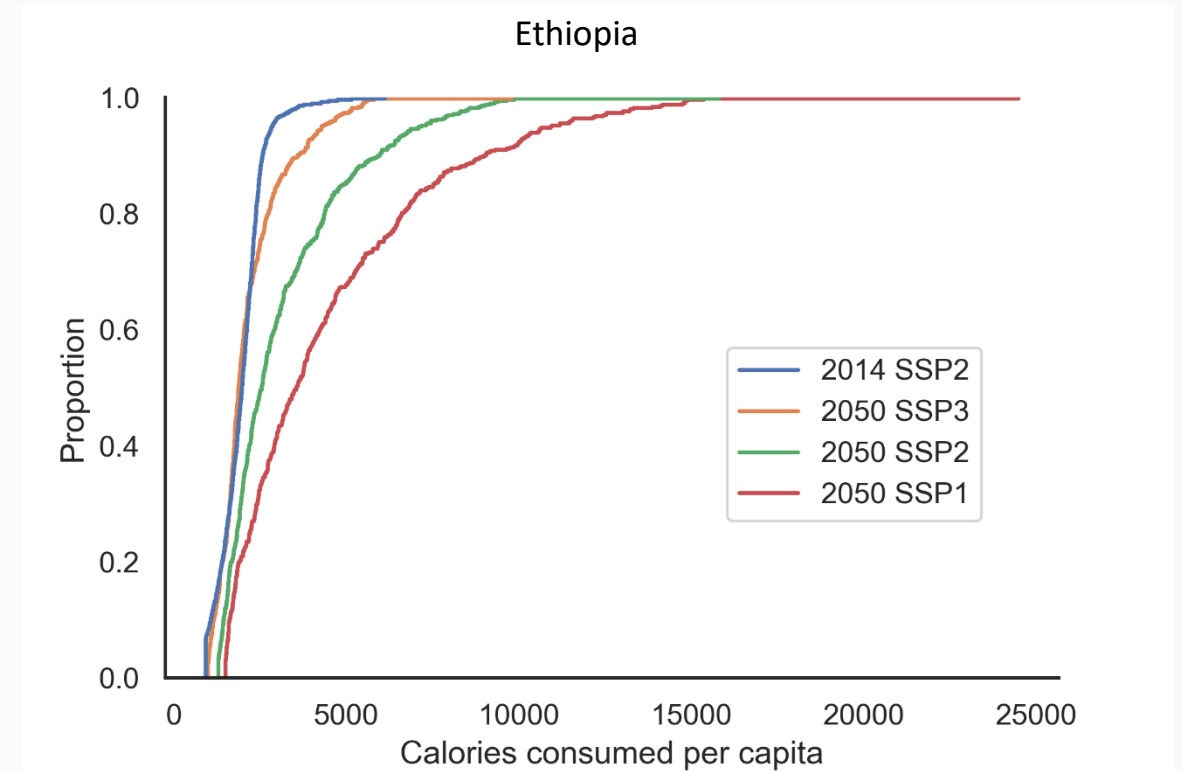
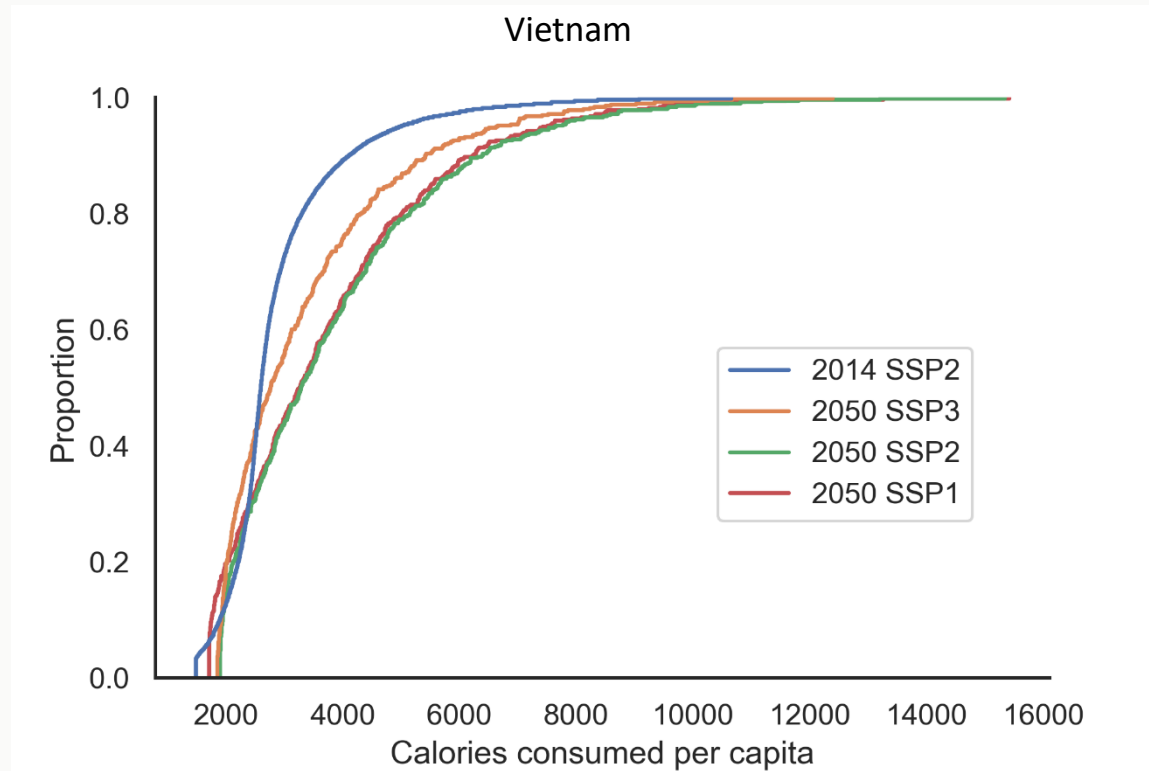


RESULTS – SDG1: INCOME DISTRIBUTION



- From this distributions:
 - calculation of GINI, \$per capita per day, Palma Index

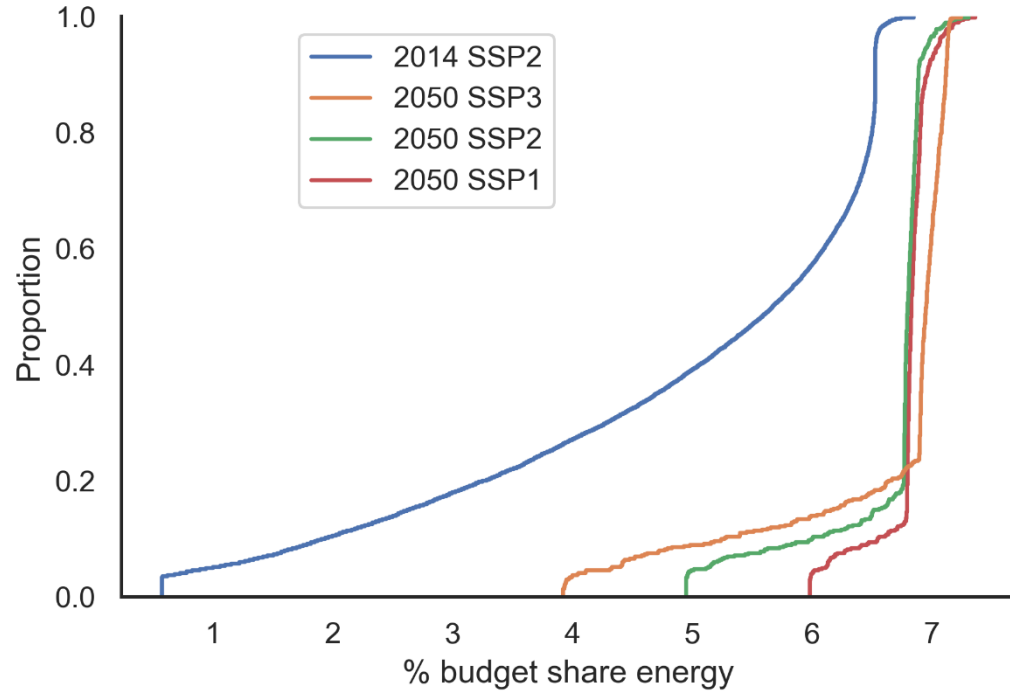
RESULTS – SDG2: CALORIES PER CAPITA DISTRIBUTION



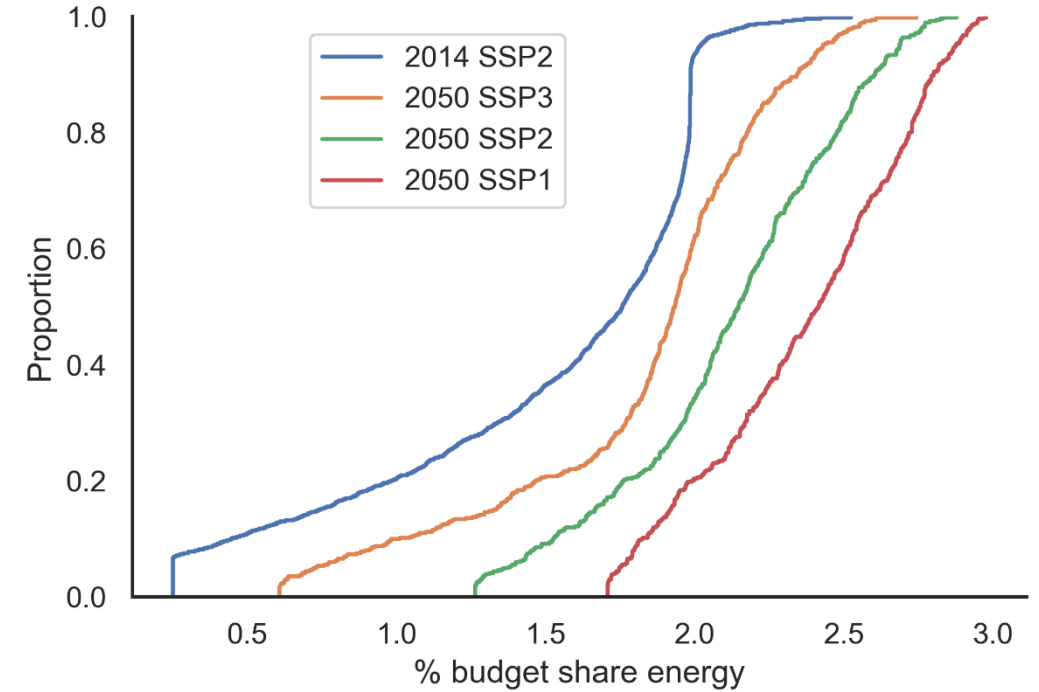
– From food consumption distributions: Calculation of food diversity index

RESULTS – SDG7: % ENERGY BUDGET SHARE DISTRIBUTION

Vietnam



Ethiopia



- Already **standard data** base allows to quantify indicators for 7 SDGs:



- **Auxiliary data** (AEZ, Power, CO2, non-CO2,...) sets add indicators for 6 SDGs:



- **New data** (household surveys, agrofood detail, aquaculture,...) allow to depict distributional effects for 3 SDGs:



- And adds 5 SDGs:



- Provides framework for future scenario analysis, e.g. sustainability of policy decisions

Thank you for your attention!

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