



Combining stakeholder scenarios and modelling: future food security, environments, livelihoods in the global south

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RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**



Environmental Change Institute



The CCAFS Framework

Adapting Agriculture to Climate Variability and Change

*Technologies, practices, partnerships
and policies for:*

- 1. Adaptation to Progressive Climate Change**
- 2. Adaptation through Managing Climate Risk**
- 3. Pro-poor Climate Change Mitigation**

4. Integration for Decision Making

- *Linking Knowledge with Action*
- *Assembling Data and Tools for Analysis and Planning*
- *Refining Frameworks for Policy Analysis*

Improved
Environmental
Health

Improved
Rural
Livelihoods

Improved
Food Security

Trade-offs and Synergies

Enhanced adaptive capacity
in agricultural, natural
resource management, and
food systems

CCAFS Scenario Development



- Explicit focus to work in three regions (EA, WA and IGP).
- The early Scen Dev work was about ‘constructing’ the client(s) for the Scenario Outputs – regional partners, identification & inclusion of NB stakeholders, ‘buy-in’
- **Two Goals**, **Goal 1.** explore key socio-economic uncertainties for food security, environments & livelihoods under climate change
- **Goal 2.** Develop capacity for governance toward improved food security, environments and livelihoods under socio-economic and biophysical uncertainty..

Complementary methods

- Socio-economic scenarios: complementary to climate scenarios
- Approach combines multi-stakeholder **storylines** with socio-economic modelling and climate scenarios
- This combines two modes/sources of knowledge, two sources of legitimacy and credibility
- Positions scenarios to function as a **boundary object** between science and decision makers... (storylines)

Industrious ants

Regional integration

Herd of Zebra



Reactive
governance

Proactive
governance



Lone Leopards



Fragmented status quo Sleeping Lions

Beyond forecasting

The modelling is not used for forecasting but to:

- Test stakeholder assumptions
- Help provide consistency
- Produce concreteness in numbers
- Produce results that are difficult to generate through qualitative process
- Link regional assumptions to global changes (e.g. population, food demand)
- The scenarios challenge the models, while the models challenge the scenarios... (2 complementary models)

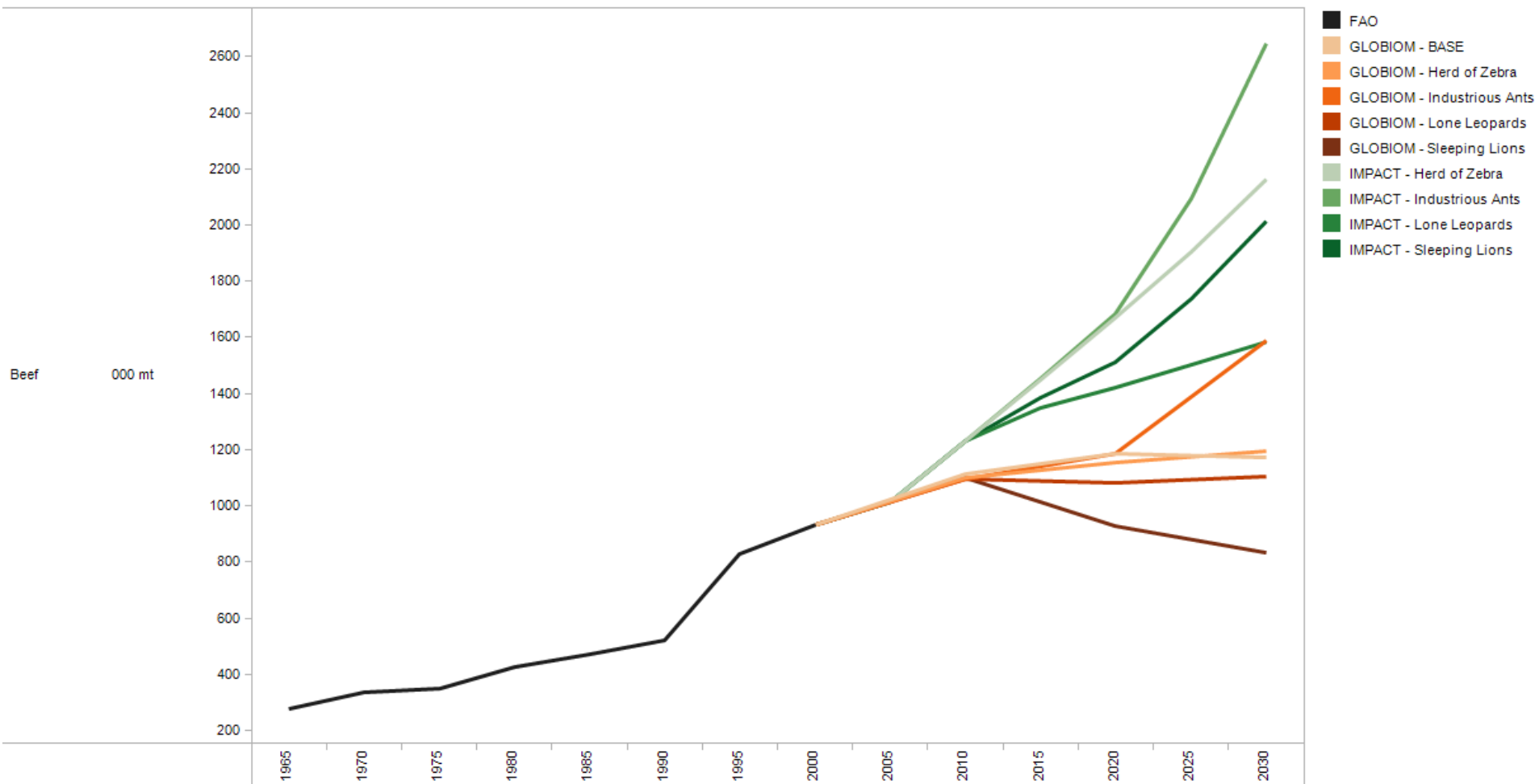
Two complementary models

- Two models are used: IMPACT (IFPRI) and GLOBIOM (IIASA)
- Both models simulate global market dynamics (with production and demand interacting) and calorie availability, but
- IMPACT has a national-level resolution, annual while GLOBIOM is regional & decadal
- IMPACT has a global market while GLOBIOM has interacting regional markets
- GLOBIOM simulates production systems, land use change, emissions... (quantification steps)

Quantification steps (9)

1. Which drivers should be quantified?
2. What is the direction of change for each driver in different time steps?
3. What is the (qualitative) magnitude of change?
4. What are the interacting drivers of this change?
5. Using historic data, what would be an estimate of the percentage change over each time step?
6. How confident are participants that they can estimate the change?
7. How much agreement was there around this estimate?
8. Do a Sensitivity analysis after first estimate
9. Iterative feedback on model results... (modelling EA beef output)

Beef production: historic and scenarios in 1000 Mtons



The trend of sum of value for year broken down by Region vs. commodity and units. Color shows details about Model Scenario Combo. Details are shown for Model, scenario and Model Scenario Combo. The data is filtered on indicator and Every 5 years. The indicator filter keeps Production. The Every 5 years filter specifies a set. The view is filtered on commodity and scenario. The commodity filter keeps Beef and GDP. The scenario filter has multiple members selected.

Using results

- Presenting model results: focus on limitations of models, differences between model assumptions to demonstrate that models do not forecast 'truth'
- Using results in back-casting to develop actionable multi-actor strategies under different scenarios
- Collaborative action plans developed that **link state and non-state actors** as well as on-going **regional CCAFS** research and comms activities – now to be realised through continual engagement process by local CCAFS partners SID... (taking the work forward)

Regional socio-economic scenarios – taking the work forward



- East Africa: **strategic planning workshops** with non-state actors (Nairobi) and policy advisors + EAC (Arusha)
- Participants' **feedback**: workshops were “participatory, practical, enriching..”, outputs “would be useful for, and gain credibility with, planners and decision makers seeking legitimate information before making choices”
- Other collaborations: **ILRI** vector borne diseases, **AgMIP** sub-national scenarios, **FAO** grassland scenarios...
(end/references)

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