



**FOODSECURE**  
FOR POLICIES THAT MATTER

# #FOODSECURE

## Plausible Futures for Global Food and Nutrition Security

Global food security challenges, ICAE pre-conference,, 7 July 2015

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# The 2050 world food equation is risk prone

## Supply

Land (degradation)  
Water (scarcity)  
Productivity & technology  
Labor & farm structure  
Climate change

=

## Demand

Population (growth)  
Income (growth, urbanization)  
Poverty and inequality  
Consumer behavior, waste  
Bio-energy

## Trade and Markets

Supermarkets  
Protection  
Financial markets  
Food stocks

# FOODSECURE objectives

The objective is to design effective and sustainable strategies for **assessing** and **addressing** the challenges of food and nutrition security.

FOODSECURE provides a set of **analytical instruments** to experiment, analyse, and coordinate the effects of **short and long term policies** related to achieving food and nutrition security (FNS).



# Key features

- 19 research institutes
- Multidisciplinary
- Stakeholder panels
- EC grant € 8 mln, duration 2012-17
- 60 journal/working papers, more coming
- User-friendly access to findings, data



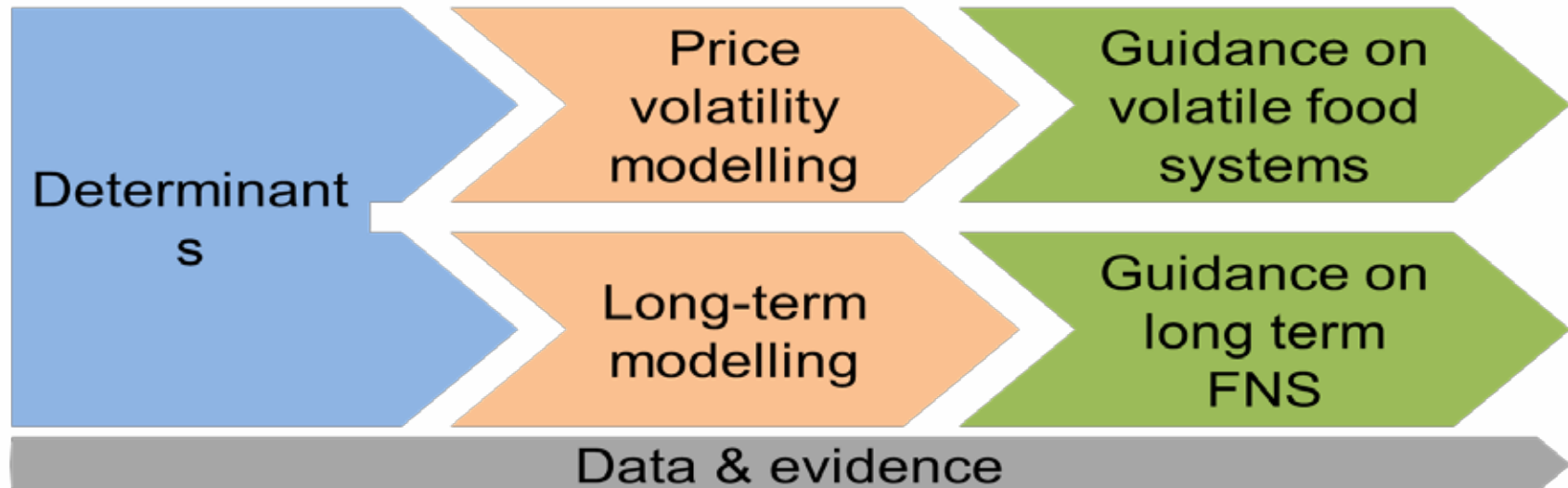
# FOODSECURE research components

**Determinants:**  
understanding  
the causes of  
hunger

**Future:** tools for  
crisis surveillance  
and foresight

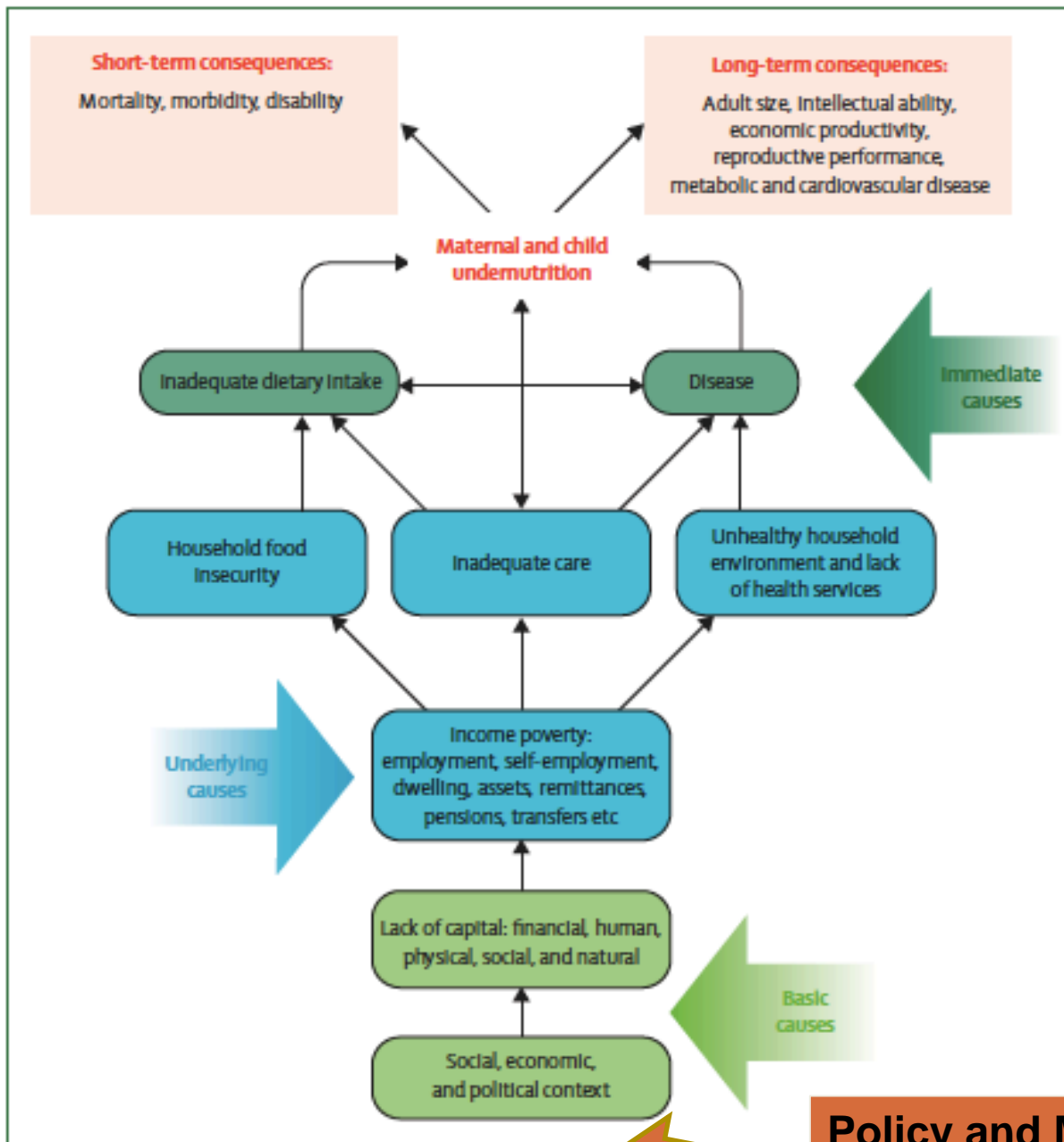
**Guidance:** on a  
global / EC policy  
framework to support  
FNS

Vision Development & Stakeholder Engagement WP5



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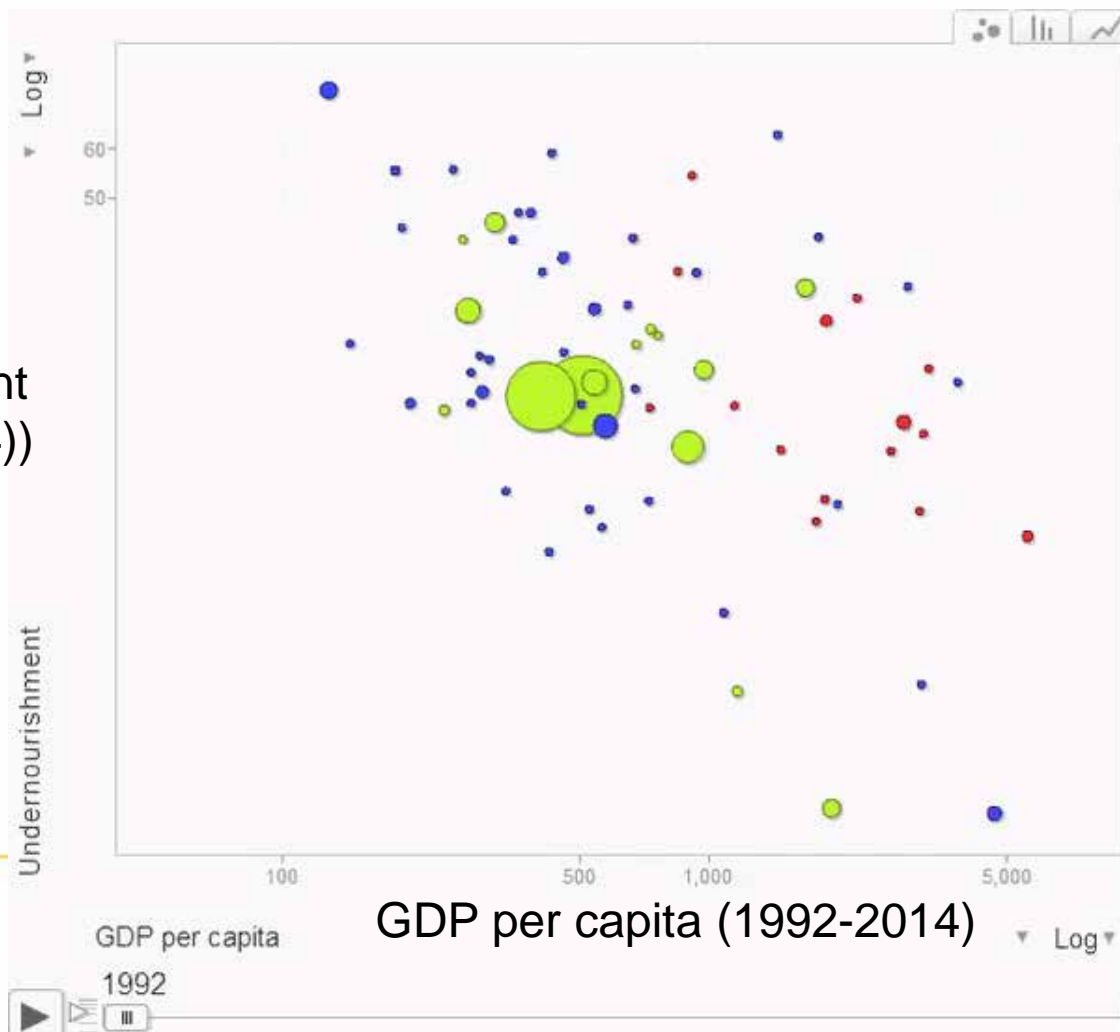
The framework on “basic” and “immediate” causes by The Lancet (2008) is good, but attention in research and policy action focuses too little on “basic” causes

Policy and Market failure Issues to be addressed

# Income growth drives evolution of undernourishment

... but is neither enough nor strictly necessary. Other factors: Inclusiveness, basic services, policy, political system, etc.

Undernourishment  
(FAO data, 92-14)



Graphic: Pieters 2015

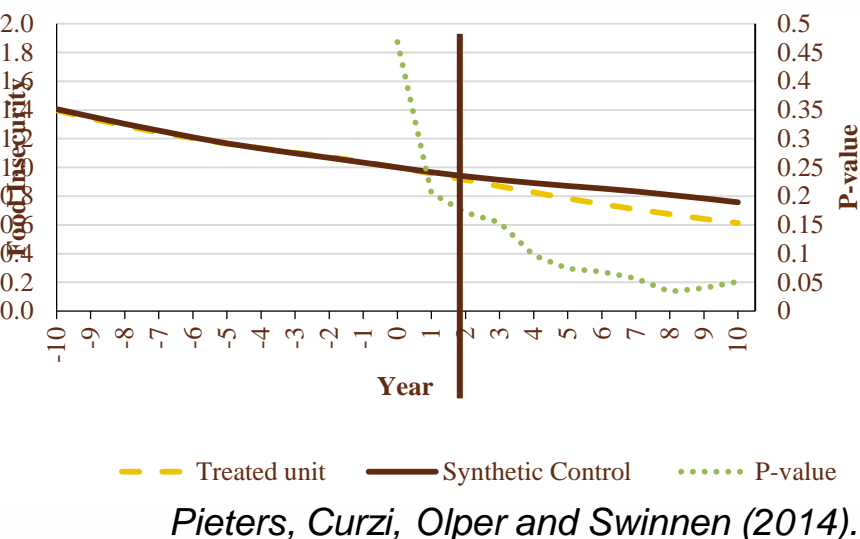


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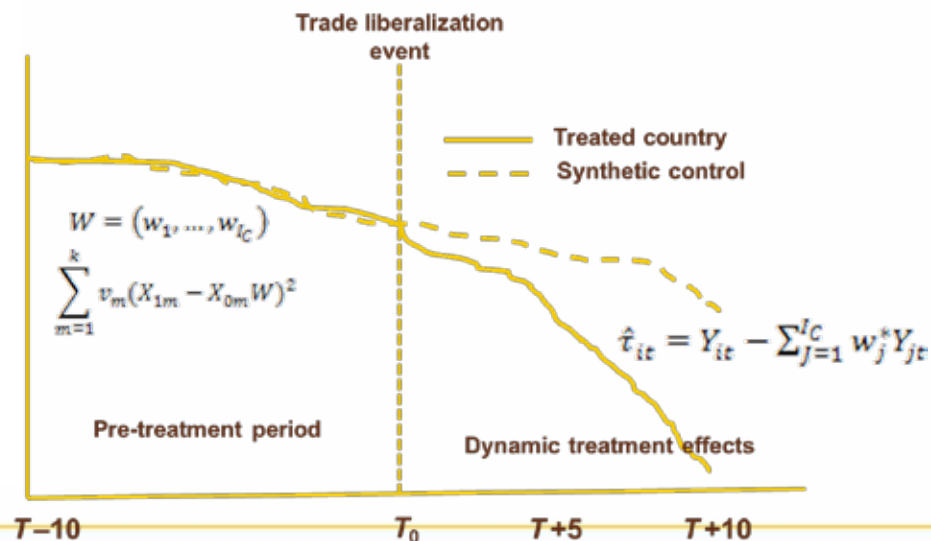
# Political reforms and trade liberalization appear good for food security,

.... but effects are heterogeneous

**Average effect of a democratic transition on food security among the 10 countries with a positive effect**



**Average effect of trade liberalization on food security among 40 LMIC countries with data covering 20years**



*Olper, Curzi, Bedin and Swinnen (2014)*





Growing  
Human Pressure

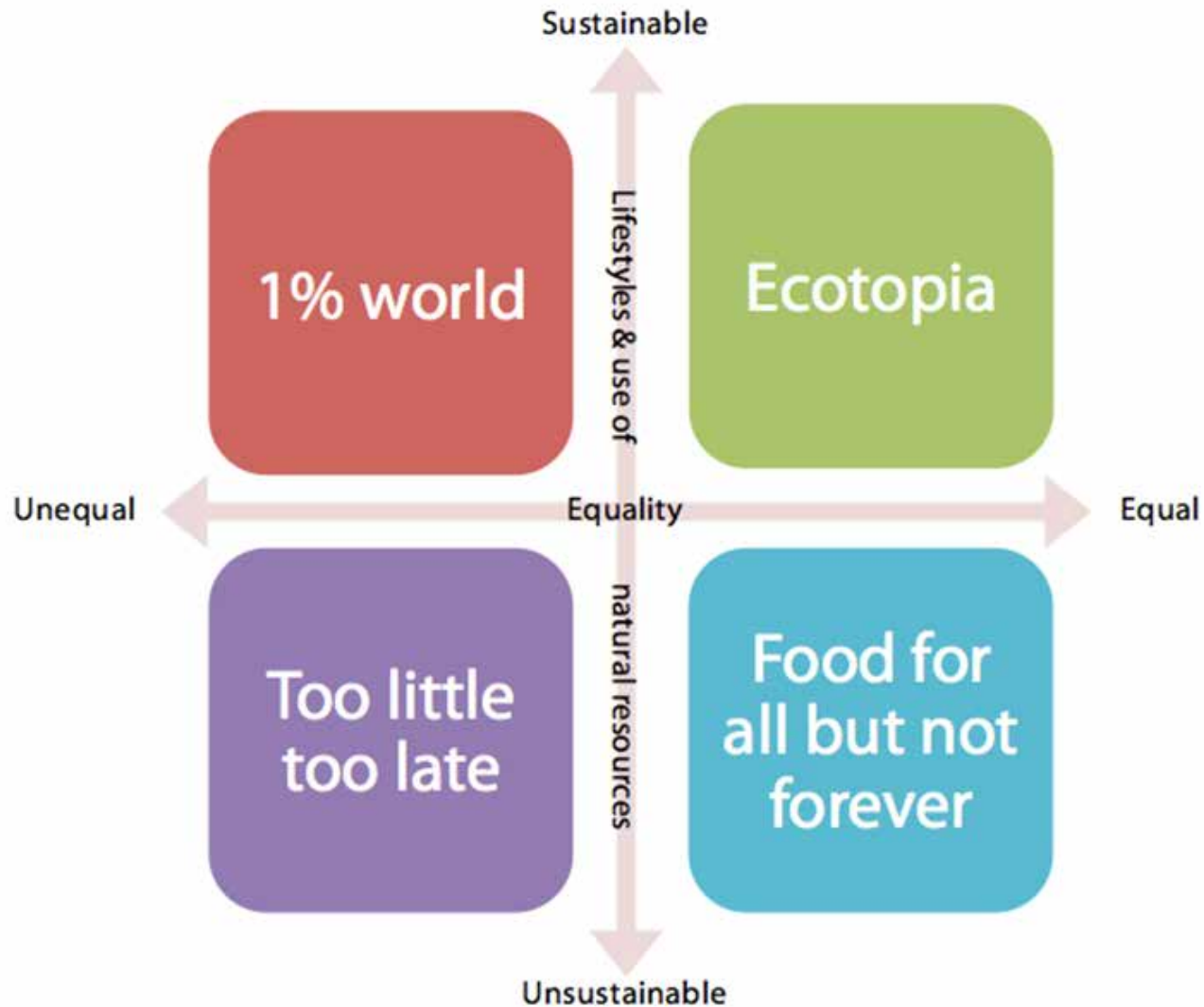
Climate change

Ecosystem  
decline

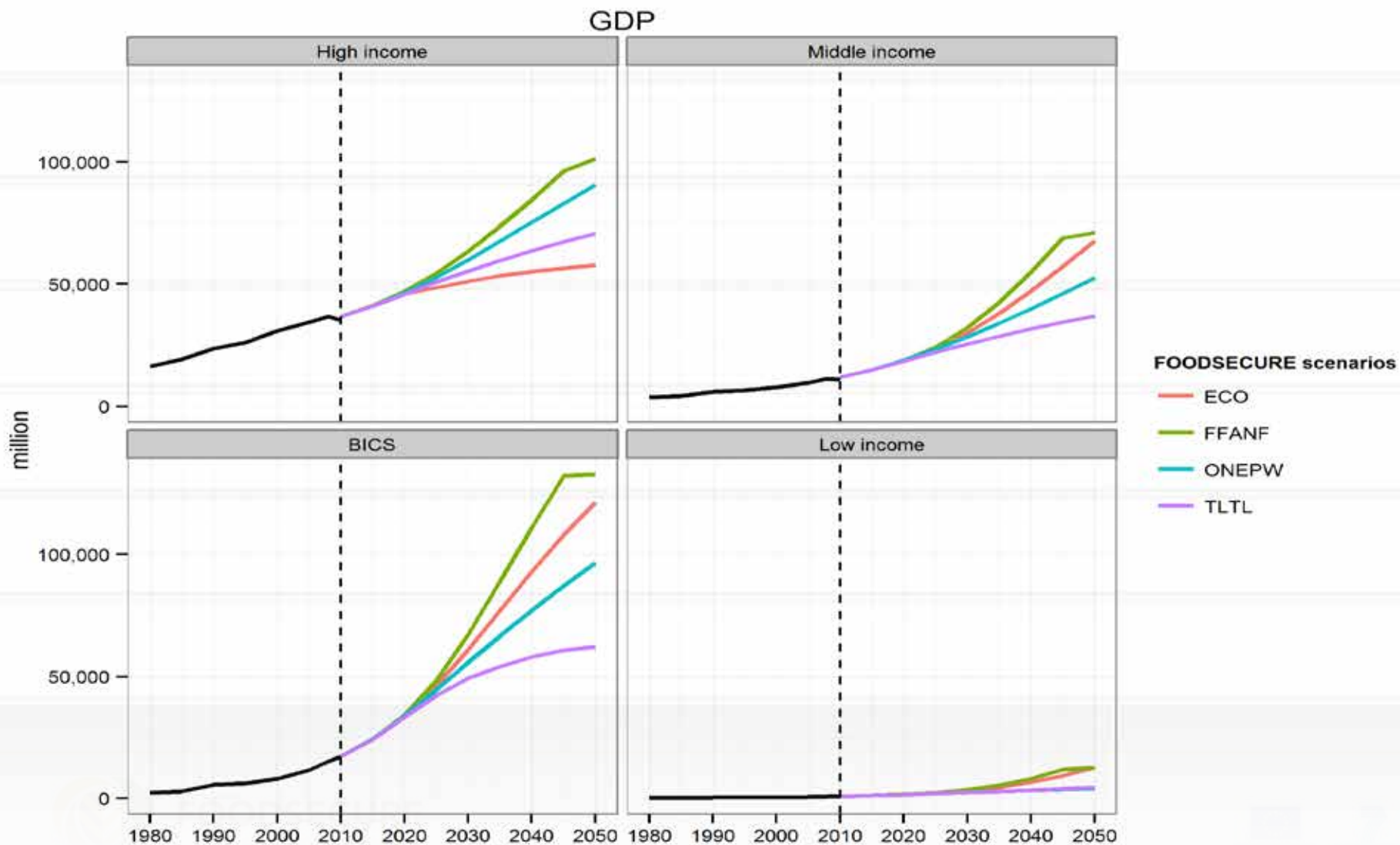
Surprise

Source: Johan Rockstrom: Let the environment guide our development

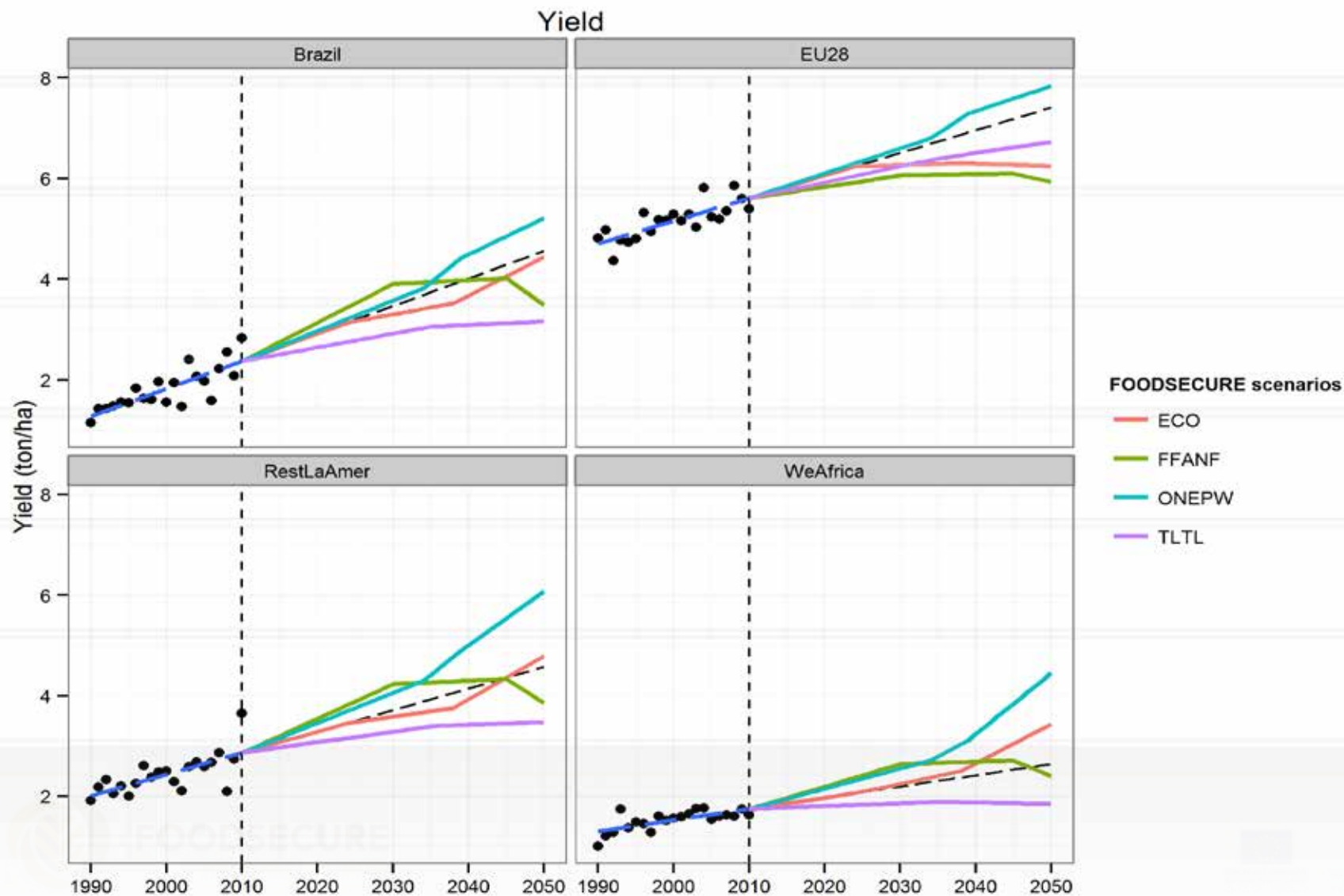
# Plausible Futures for FNS



# GDP assumptions by scenario and income group: 2010-2050



# Wheat yield by scenario for representative region income groups: 1990-2050



## MIRAGE:

Multi Country, Multi Sectoral Dynamic CGE  
Trade policy analysis, Biofuels, Climate Change  
**Household decomposition within the CGE**

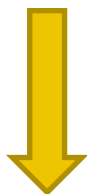
## CGE

## MAGNET:

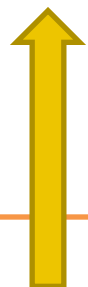
Modular Applied GeNeral Equilibrium Tool  
Agricultural (CAP) policy analysis,  
Renewable energy, land use  
**Household decomposition within the CGE**

Shared databases,  
'GTAP' style framework  
Joint Modelling approach  
Joint Macroeconomic Baseline

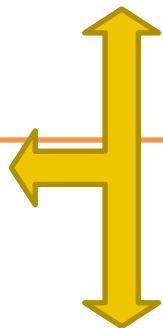
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E



F



G



## PE

## IMPACT model:

Multi Country, Multi Commodity Dynamic PE  
Large set of commodities  
**Water Module** coupled to an Hydrology model  
**Land allocation module** (to be developed) linked to the SPAM model  
**Crop models DSSAT** response to climate change

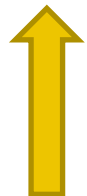
## GLOBIOM model:

Multi Country, Multi Commodity Dynamic PE  
**High level of spatial disaggregation**  
**Alternative technologies / Management techniques for each cell, each crop**  
**Advanced modeling for the forestry sector**

## IMAGE model:

The Integrated Model to Assess the Global Environment  
**Society-biosphere-climate System.**  
Terrestrial vegetation Module and land cover Module  
**Energy model (TIMER)**  
Atmospheric Ocean System

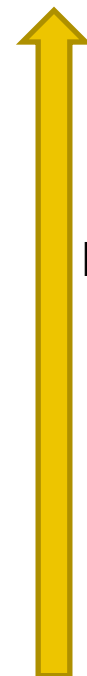
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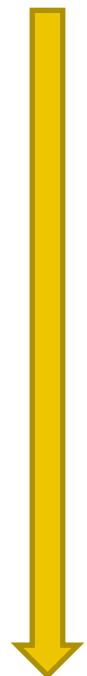
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B



A



## Household model(s)

Focus on nutrition, food demand, health consequences

C



# Underpinning a sensible policy framework, short term and long term strategies

- The purpose is to support EU policy makers and other stakeholders in the design of FNS strategies.
  - Agriculture
  - Fisheries
  - Trade
  - Agricultural R&D
  - Climate change
  - Environment
  - Development aid



# Position of ICAE pre-conf in the project flow

2012  
2015  
2016  
2017

Evidence base

Modelling toolbox

Mapping visions/options,  
global & EU level

Modelling of long-term  
scenarios

“Roadmapping”  
Navigator

Final dissemination conferences  
Science-policy interaction

Write-up / Navigator à project end

ICAIE pre-  
Conference



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# Thank you!

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