

An economy-wide assessment of the food security impacts of changes in biofuel policies and use

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Recent developments in food security decision making, to be addressed by the framework

- Nutritional outcomes & indicators gain importance
 - Children underweight
- Long-term food security framework
 - Stability of access to food, crises
 - Food systems link to energy, chemical, finance
 - Producing more with less
- Policy pressure on target biofuel shares in fuel consumption



Unicef

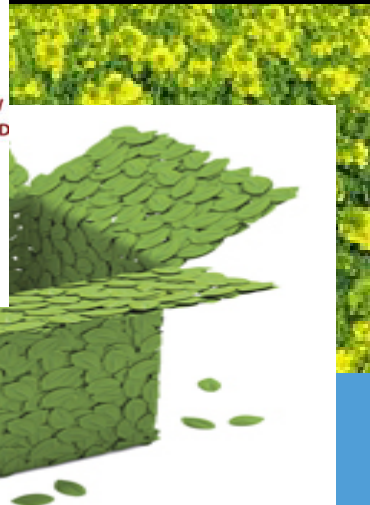
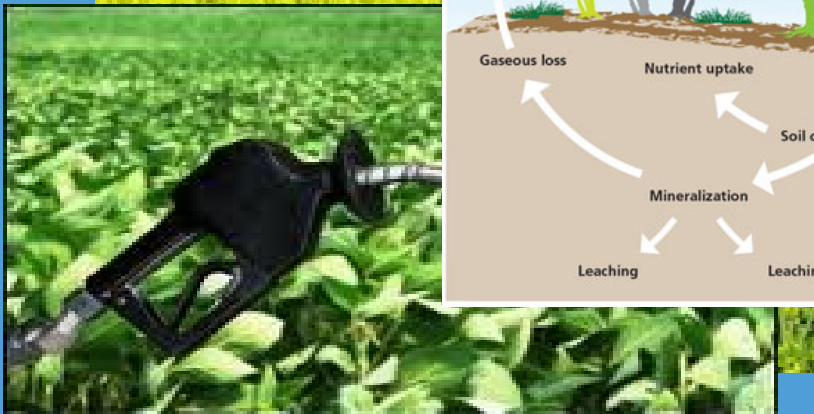
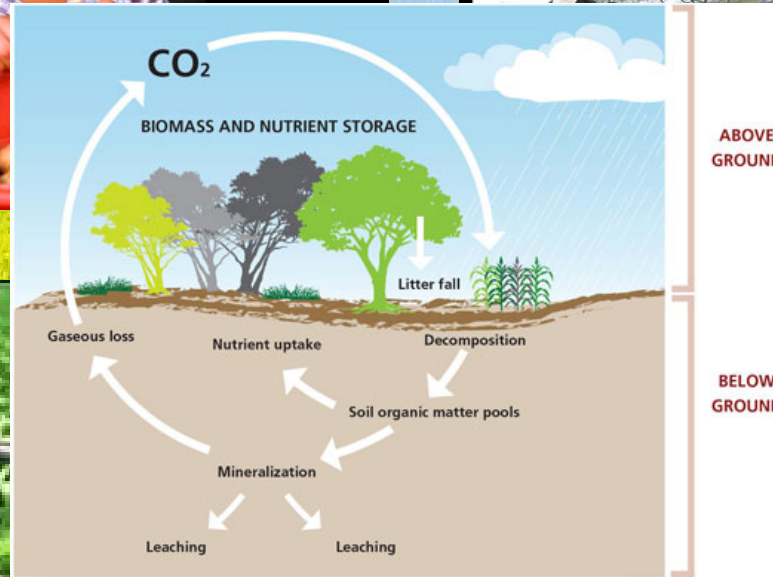
Imperial College
London

The Montpellier Panel Report
*Africa and Europe: Partnerships
for Agricultural Development*



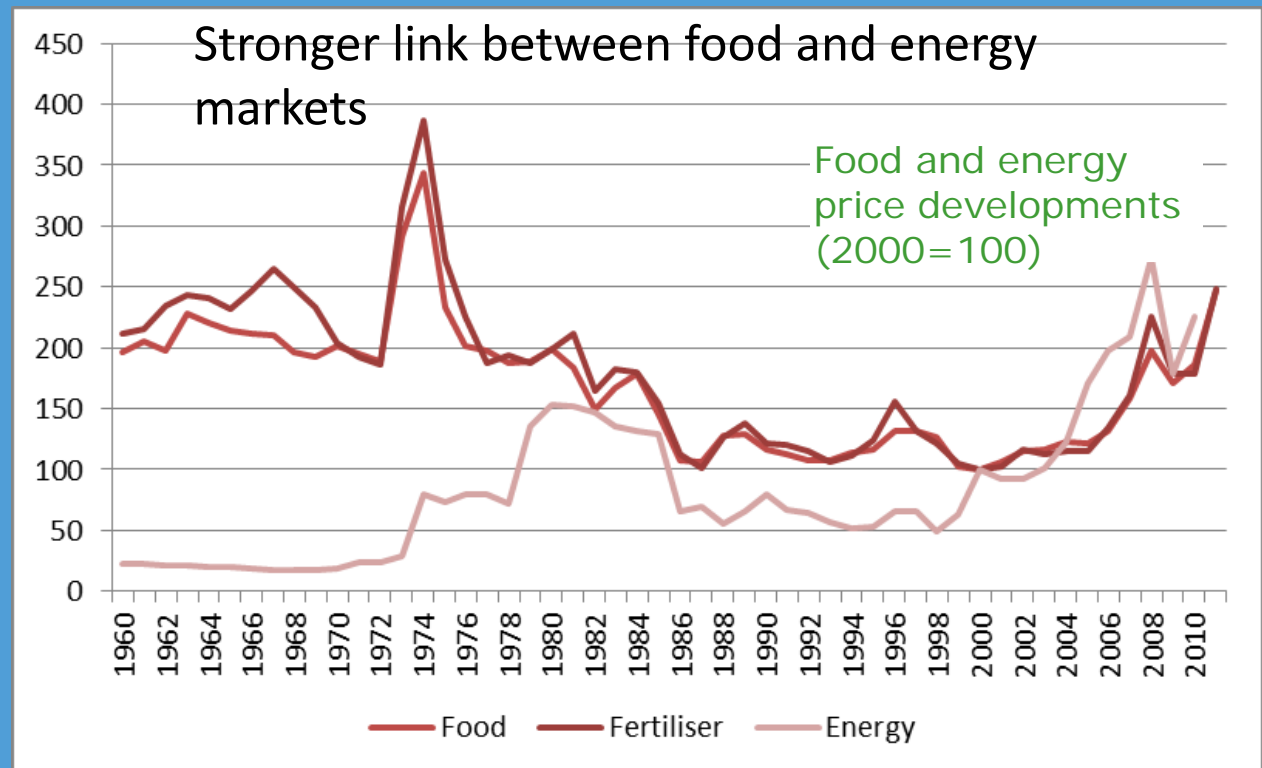
4 economic pathways connect biofuels
to food security across multiple scales

Pathway 1: food availability vs competing demands for agricultural land



Pathway 2, Upward pressure and more volatile food prices increase risk of hunger

- Biofuels: tight grain/oil markets, no smoking gun
- High food prices transmit poorly to producers, food access at risk



Pathway 3 –accelerate investment in low-yield regions, rising incomes

- Yield gap
- Agricultural practices – spill over into food crops?
- Uncertain cash crops



Pathway 4, macroeconomic impact



- Growth linkages & composition
- Industrial chains, clusters
- Foreign reserves (energy import bill)



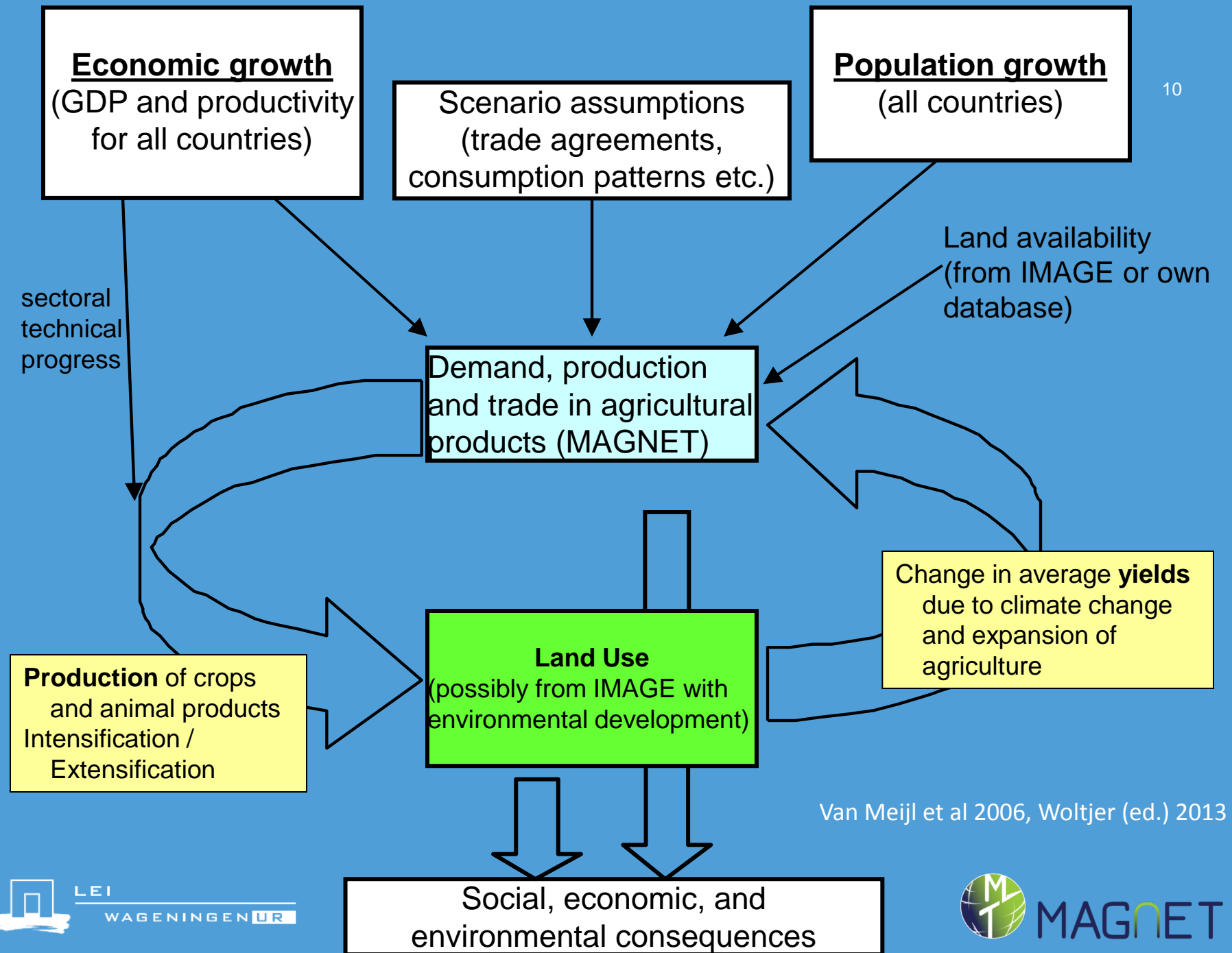
Conclusion from the framework: Biofuels on defense, postpone the verdict

- *THE IMPACT* on food security???
 - Simultaneous effects over multiple scales (global to local) and time horizons (short term and long term)
 - 4 economic pathways, direction of impacts on food security is not a priori clear.
- Idiosyncratic conditions surrounding a planned investment or biofuel policy
 - Health & nutrition status
 - Land markets
 - Scale, value chain development, spill overs
 - Scope for possible redistributions: rural/urban

At local level, food issues override many energy, carbon, environment, biodiversity arguments!

A framework for empirical analysis of bio-energy-food security relations

- 4 pathways cover price, income effects and macroeconomic effects
 - interaction between agriculture and the wider economy through trade, labour market, capital
- Key underlying mechanisms
 - allocation of available land of different qualities
 - energy or fuel balance in the production country
- Framework designed to capture these pathways is “computable general equilibrium” (CGE) modelling.
- **Modular Applied GeNeral Equilibrium Tool**, of LEI



Proxy indicators in a CGE assessment framework (1)

1. Food availability and land use

Change in agricultural production

Change in agricultural land use

Change in agricultural land prices

Food self-sufficiency ratio (ratio of volumes of total food consumption over total domestic food production)

2. Food prices

Change in (structural) agricultural prices, world market and regional prices

→ Volatility ? other framework

Proxy indicators in a CGE assessment framework (2)

3. Household income from farming and other labour

Change in non-skilled wages

Change in agricultural value added as proxy for farm income

Change in food-basket purchasing power

Change in per capita food consumption

4. Macroeconomic performance

Share of biofuels in fuel consumption for transportation

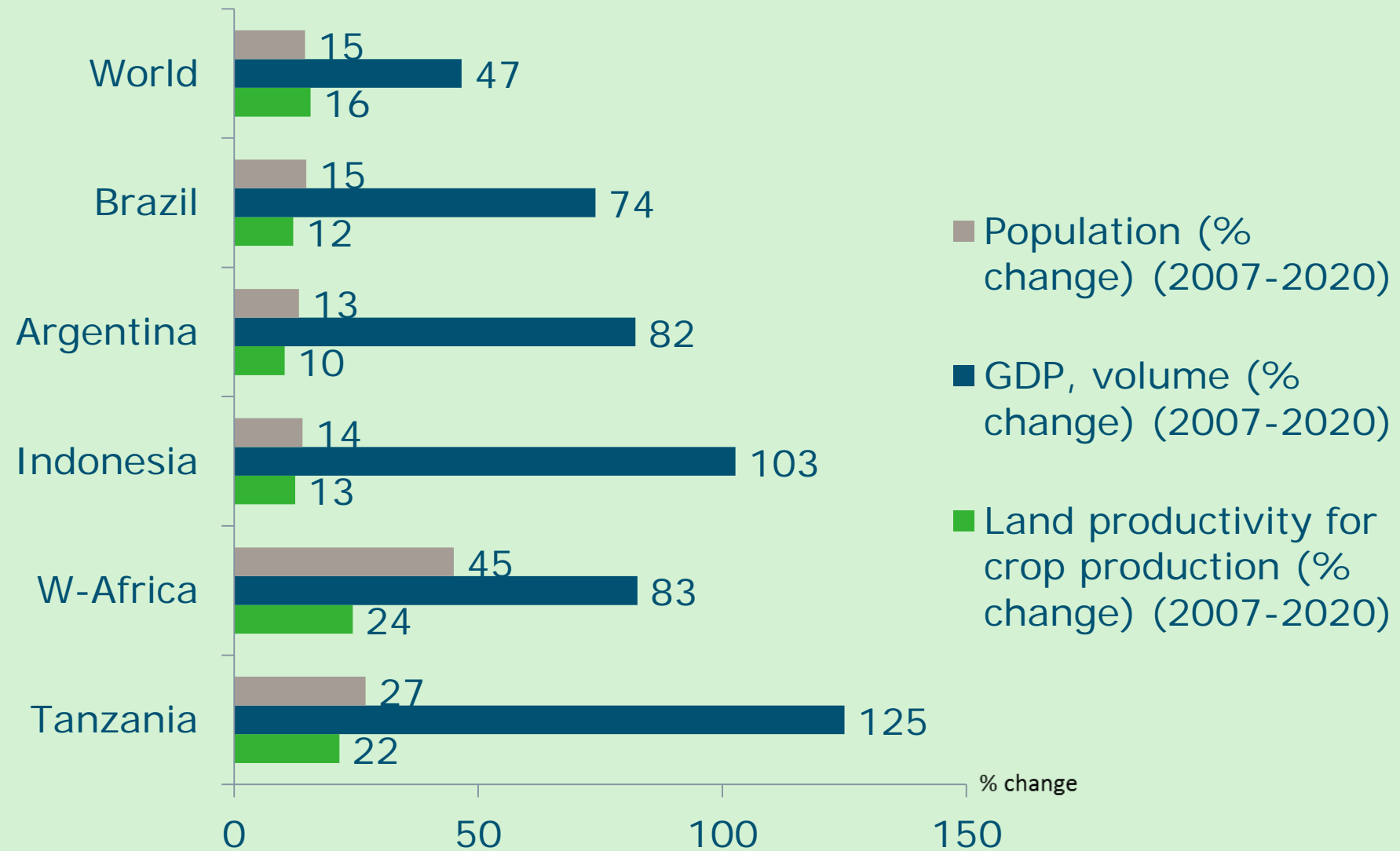
Trade balance in feedstock for biofuels

GDP change

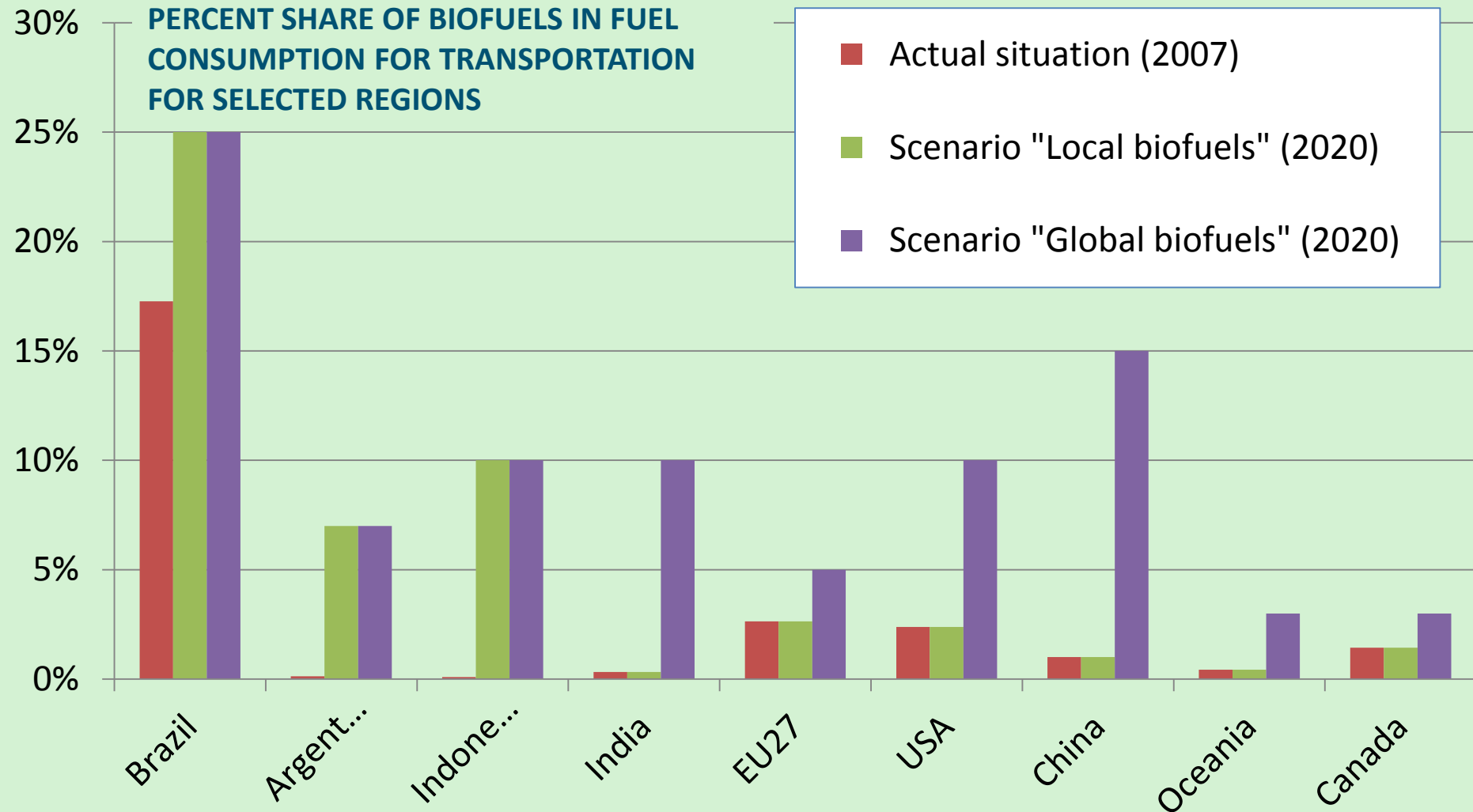
Specific sectors and regions in the aggregation and analysis

Case study sector/markets	Proxies in the modelling analysis	
Sugar cane sector in Brazil	GTAP v8, Sector group	GTAP v8, Country
	Sugar cane & beet Sugar	Brazil
Soybean sector in Argentina	Oil seeds (crude vegetable oils) Vegetable oils and fats	Argentina
	Oil seeds (crude vegetable oils) Vegetable oils and fats	Indonesia

Assumptions for population, GDP and yields towards 2020



Scenario analysis: what effects of government targets on food security?



Conclusions: jury still out, urgency of evidence to support biofuel use (1)

- No efficiency argument to support massive Biofuel I push
 - With MAGNET model in pro-biofuel setting:
 - Challenging macroeconomics, global GDP losses
- Also none to counter a modest push!
- Welfare in some African food exporters could improve!
- Assumptions that drive the analysis:
 - Energy prices < > Agriculture
 - Yields/technological change
 - Market integration, energy & other policies

Conclusions: jury still out, urgency of evidence to support biofuel use (2)

- **Availability** 3-46m ha new land (ecosystem services?); status quo in self-sufficiency risk in 2007-20
- **Affordability** global food prices up 3%; local prices more in supply regions (Bra-Arg-Idn),
- **Access/income** balance urban losses to rural gains
 - Income gains for farmers
 - Rural growth linkages?
 - Wages up, more capital → higher skills level?

Research agenda on the way forward

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- The evaluation of the potential of bioenergy and biofuel to promote rural development
 - Production methods → socioeconomic impact
 - Technology spill-overs
- Capture nutritional aspects, long and short term impact
 - more detail on (typologies of) households
 - Nutrient content of consumption baskets, diets
 - Coping mechanisms of vulnerable households
- FP7 project 2012-17, LEI (lead), ZEF, IFPRI, Leuven

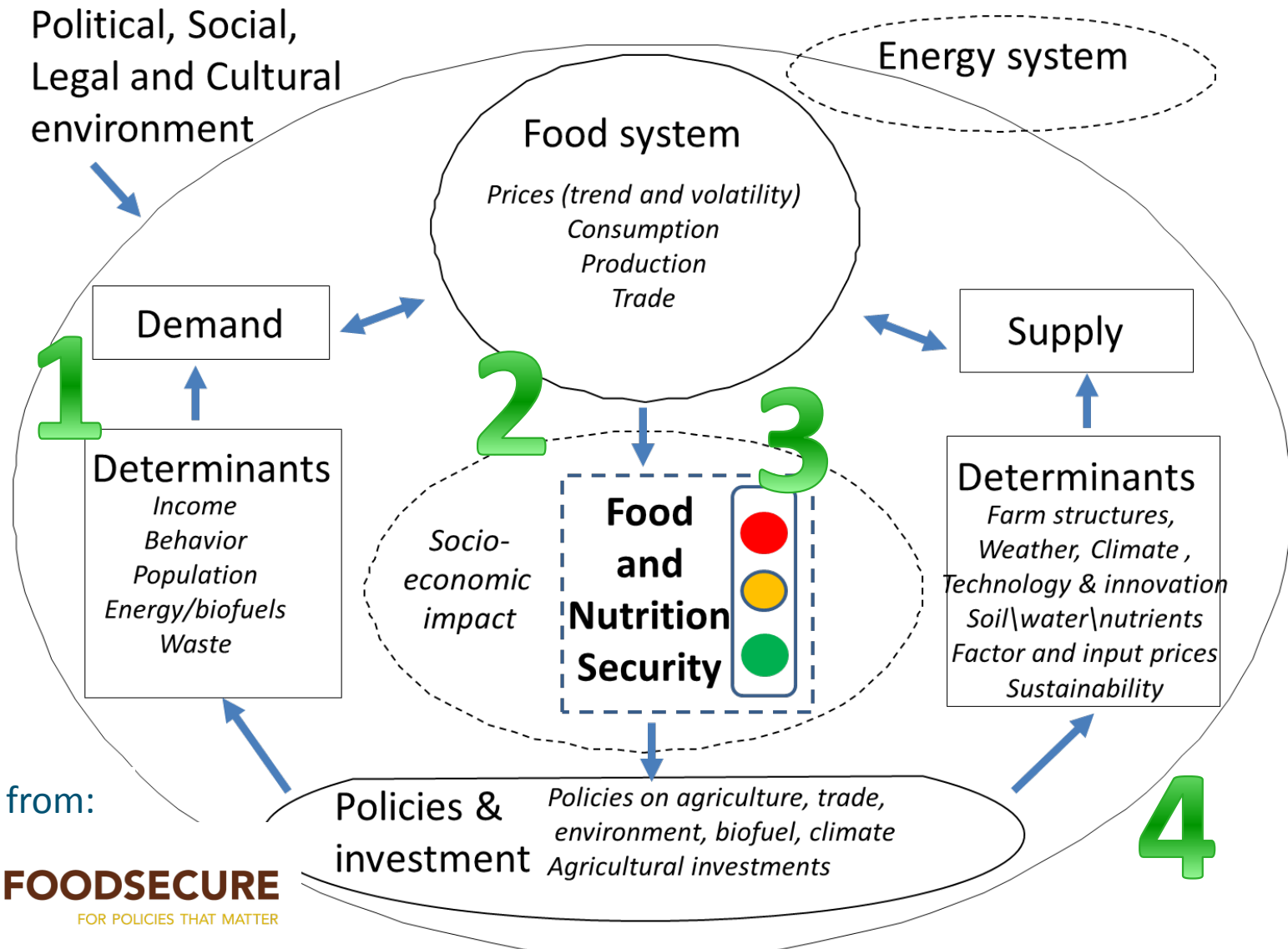


FOODSECURE

FOR POLICIES THAT MATTER

Interdisciplinary research project to explore the future of global food & nutrition security

Positioning of biofuels connections to food security in the bigger picture



Adapted from:



FOODSECURE
FOR POLICIES THAT MATTER

Thank you

Papers under preparation:

Thom Achterbosch, Geert Woltjer, Hans van Meijl, Andrzej Tabeau, Heleen Bartelings and Siemen van Berkum (forthcoming). *An economy-wide assessment of the food security impacts of changes in bioenergy use*. Global BioPact (WP4). LEI, part of Wageningen UR

Meijerink, Smeets, Slingeland and Achterbosch (forthcoming). *Biomass and food security*. LEI, part of Wageningen UR



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www.foodsecure.eu