



CENTRE
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SUR L'ENVIRONNEMENT
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The role of Globalisation in the main food prospectives to 2050

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brunelle@centre-cired.fr

C.I.R.E.D. UNITÉ MIXTE DE RECHERCHE
EHESS ET CNRS - UMR 8568
JARDIN TROPICAL
45 BIS AVENUE DE LA BELLE GABRIELLE
94736 NOGENT-SUR-MARNE CEDEX - FRANCE

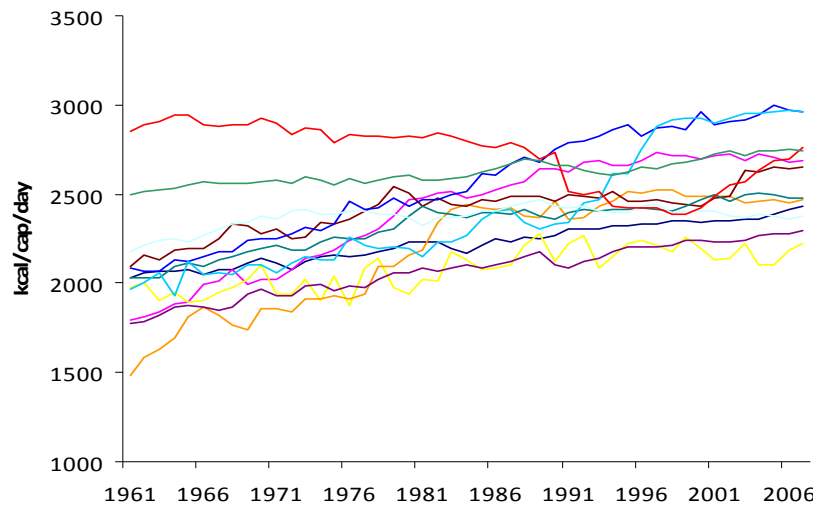
Outlines

Three objectives / questions:

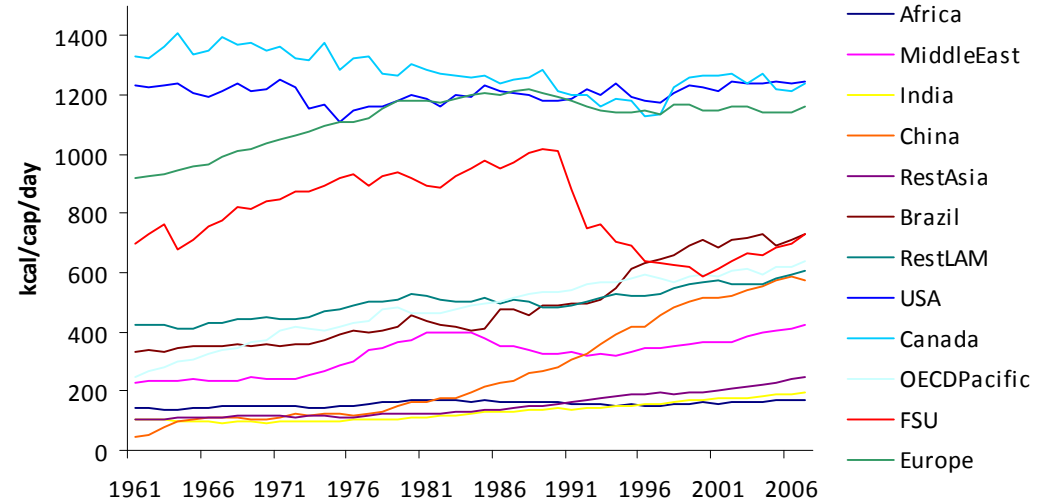
- 1. How is Globalisation accounted for in the main global food projections to 2050 ?**
- 2. How do these food scenarios impact agriculture ?**
- 3. How do they interact with other land-use policies ?**

Evolutions of the dietary habits over the 1961-2007 period

Plant food calories



Animal calories



Consumption
per cap
1961-2007

+ 25%

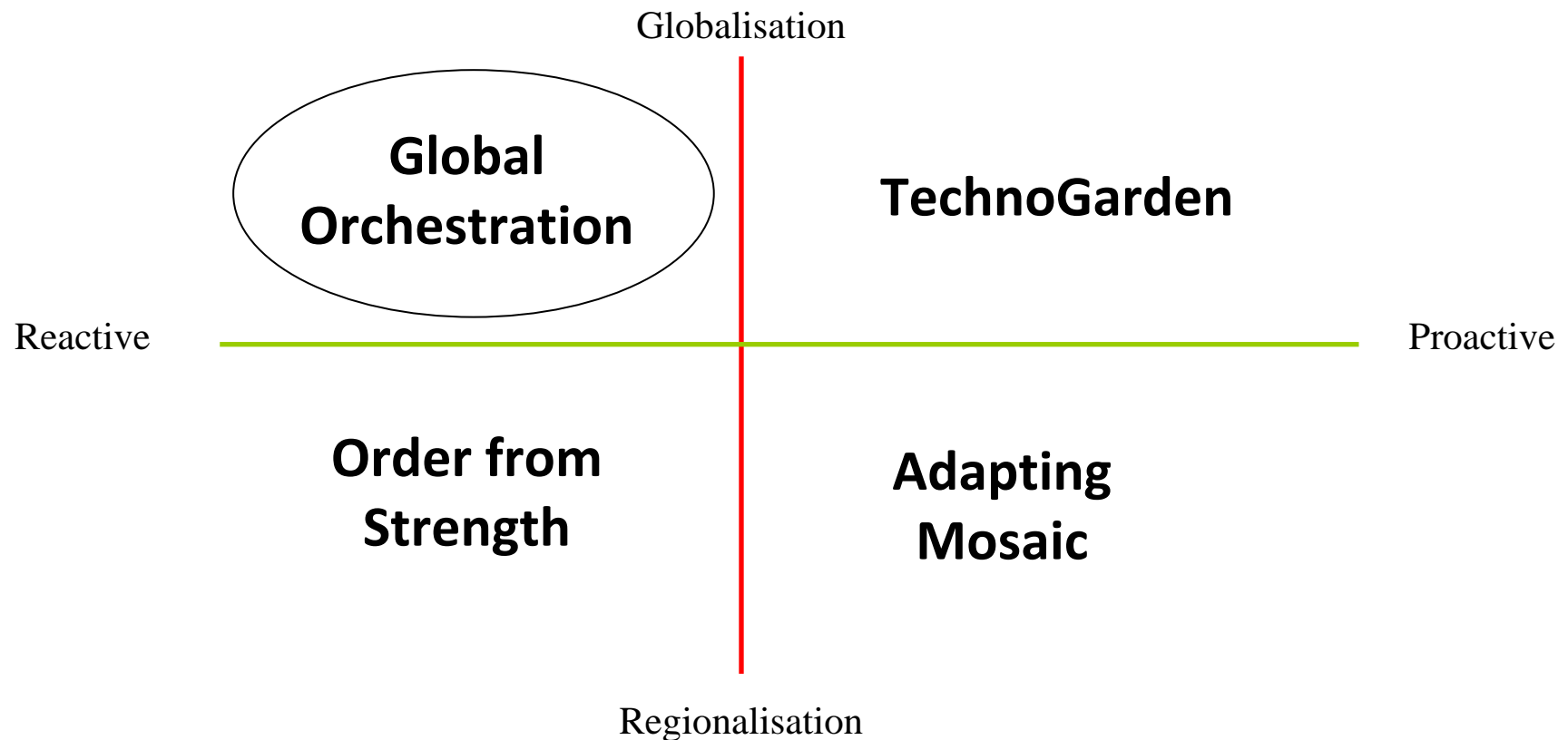
+ 37%

How is Globalisation accounted for in the main food projections to 2050?

- **Millennium Ecosystem Assessment (2005)**
- **Tilman (2011)**
- **FAO (2012)**
- **Agrimonde (2009)**

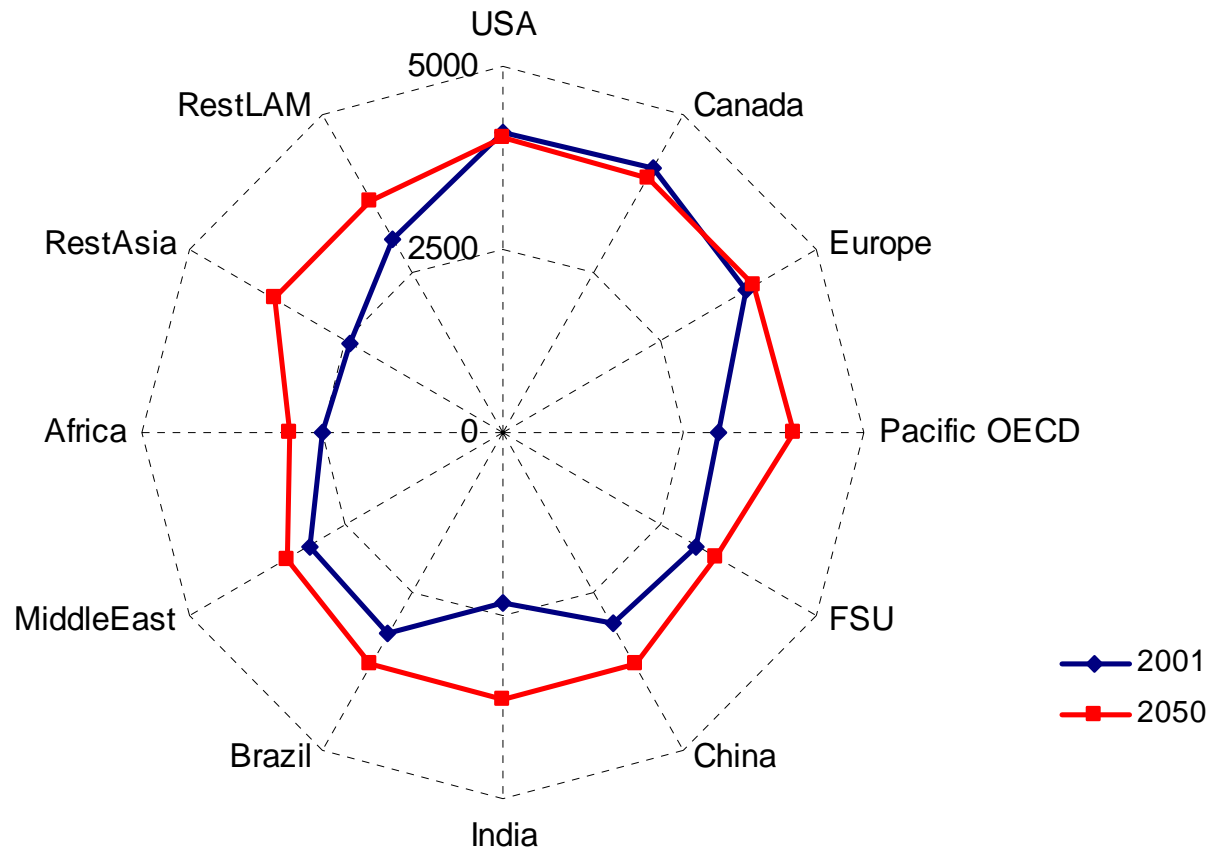
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- **Millennium Ecosystem Assessment (2005)**



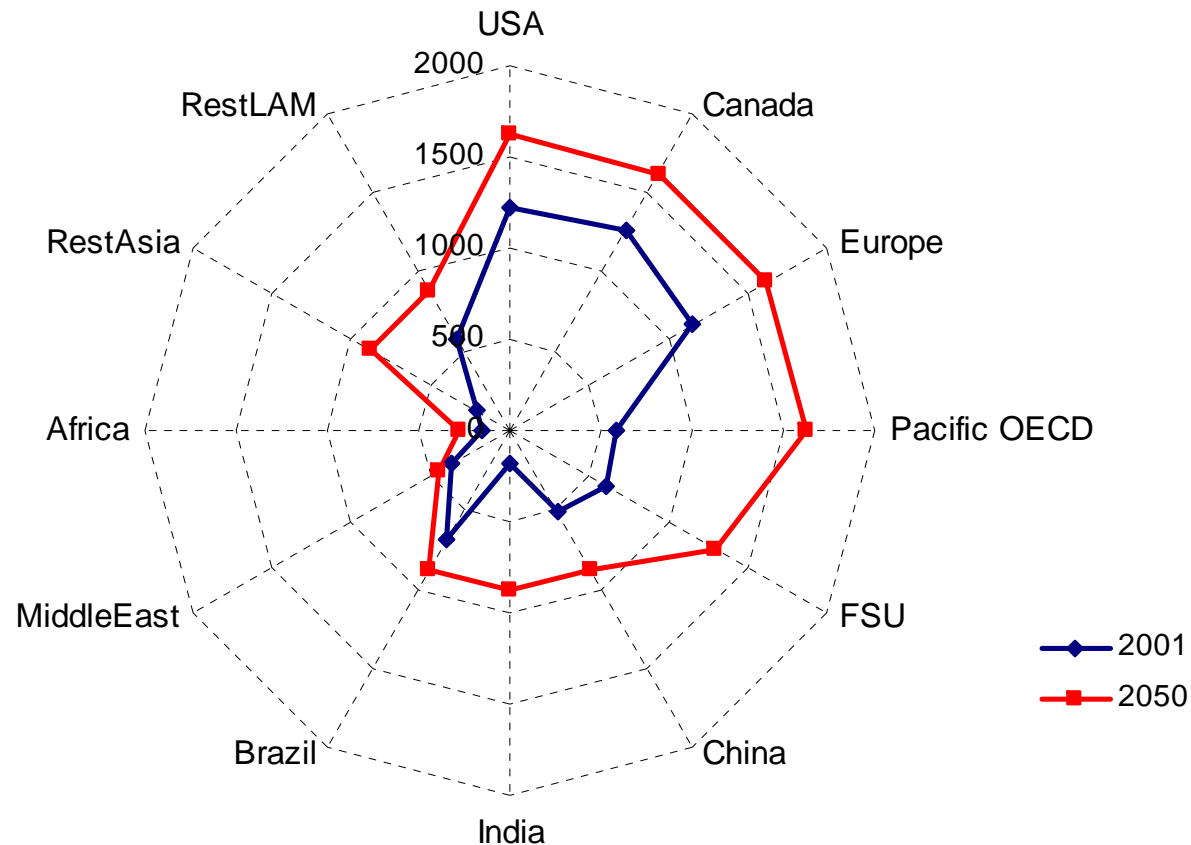
How is Globalisation accounted for in the main food projections to 2050?

Total food consumption in the Global Orchestration scenario (availability in kcal/day/cap)



How is Globalisation accounted for in the main food projections to 2050?

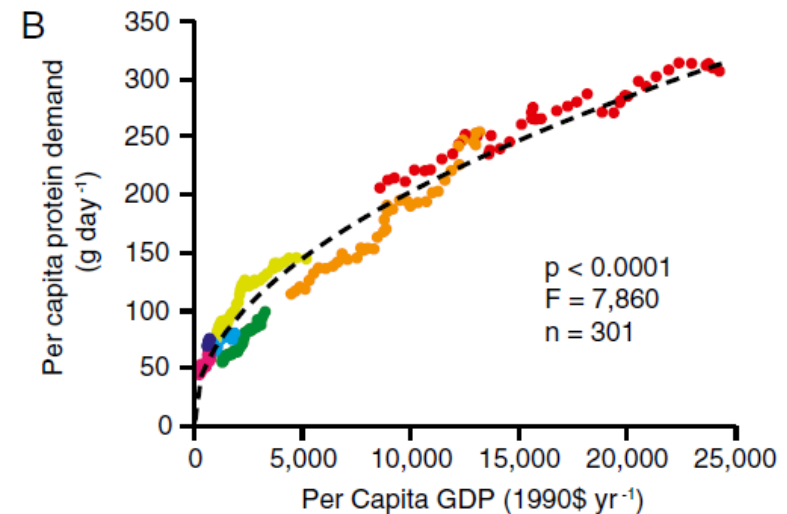
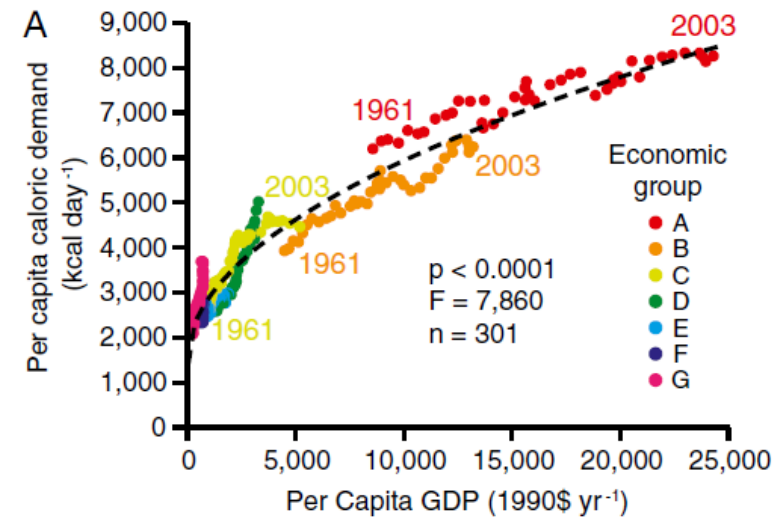
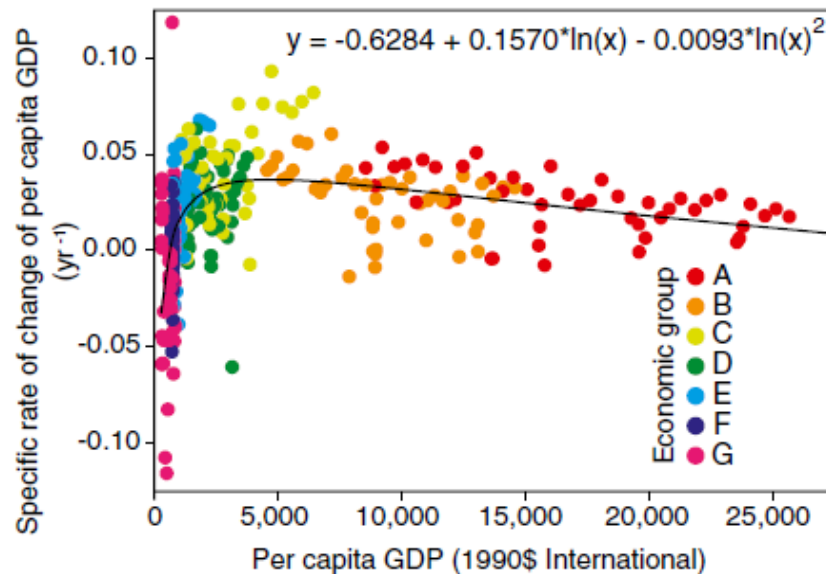
Consumption of animal products in the Global Orchestration scenario (availability in kcal/day/cap)



How is Globalisation accounted for in the main food projections to 2050?

- **Tilman (2011)**

Kuznet Curve for projecting GDP:



How is Globalisation accounted for in the main food projections to 2050?

- **FAO (2012)**

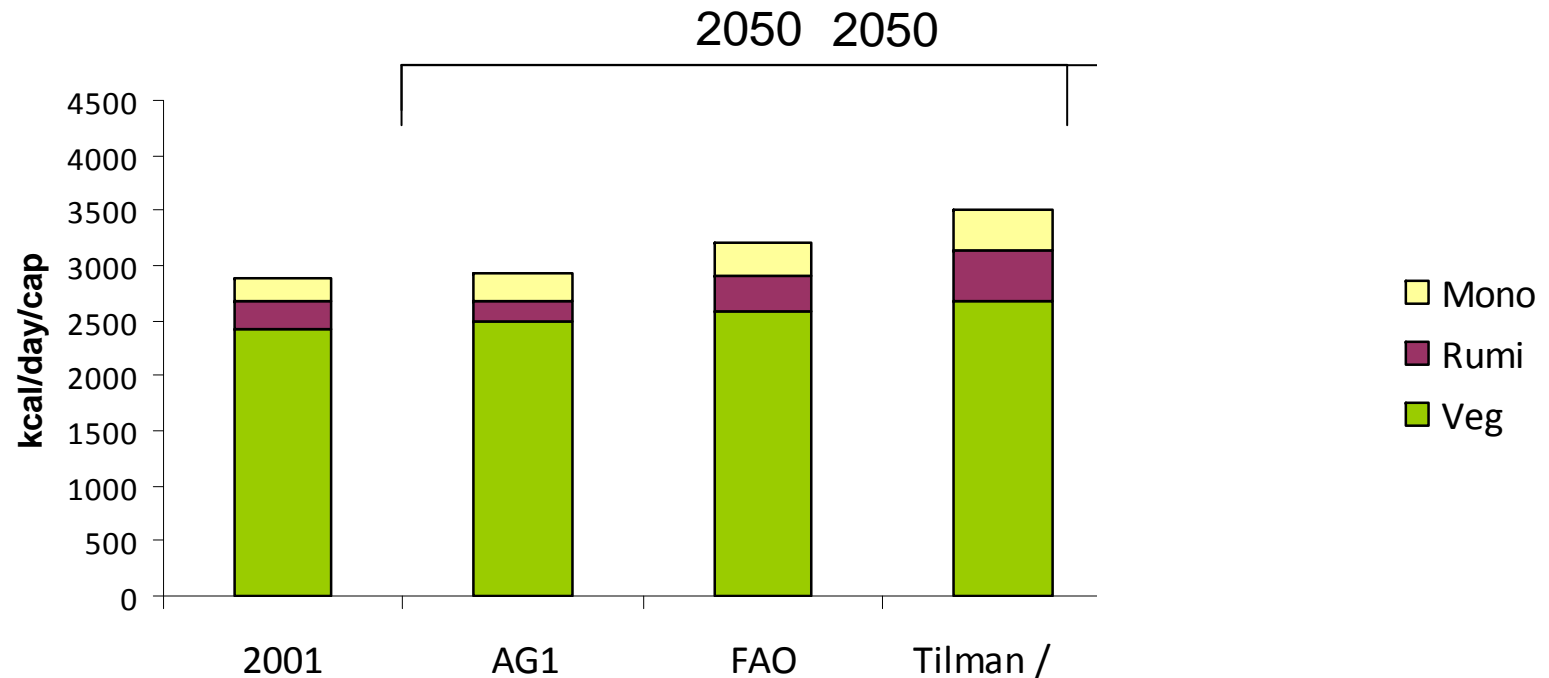
- Population and income are the two main drivers
- Relative convergence in per capita incomes
- Slowdown of the « livestock revolution »
- Significant regional specificities remain (e.g., India)

- **Agrimonde (2009): Two contrasted scenarios**

- MEA – Global Orchestration
- A « Green » Scenario: Agrimonde 1 (**AG1**)

How is Globalisation accounted for in the main food projections to 2050?

World average food availability



Production growth 2001-2050

↓ + 50% ↓ + 60% ↓ + 100% ↓ + 150%

How food scenarios impact agriculture?

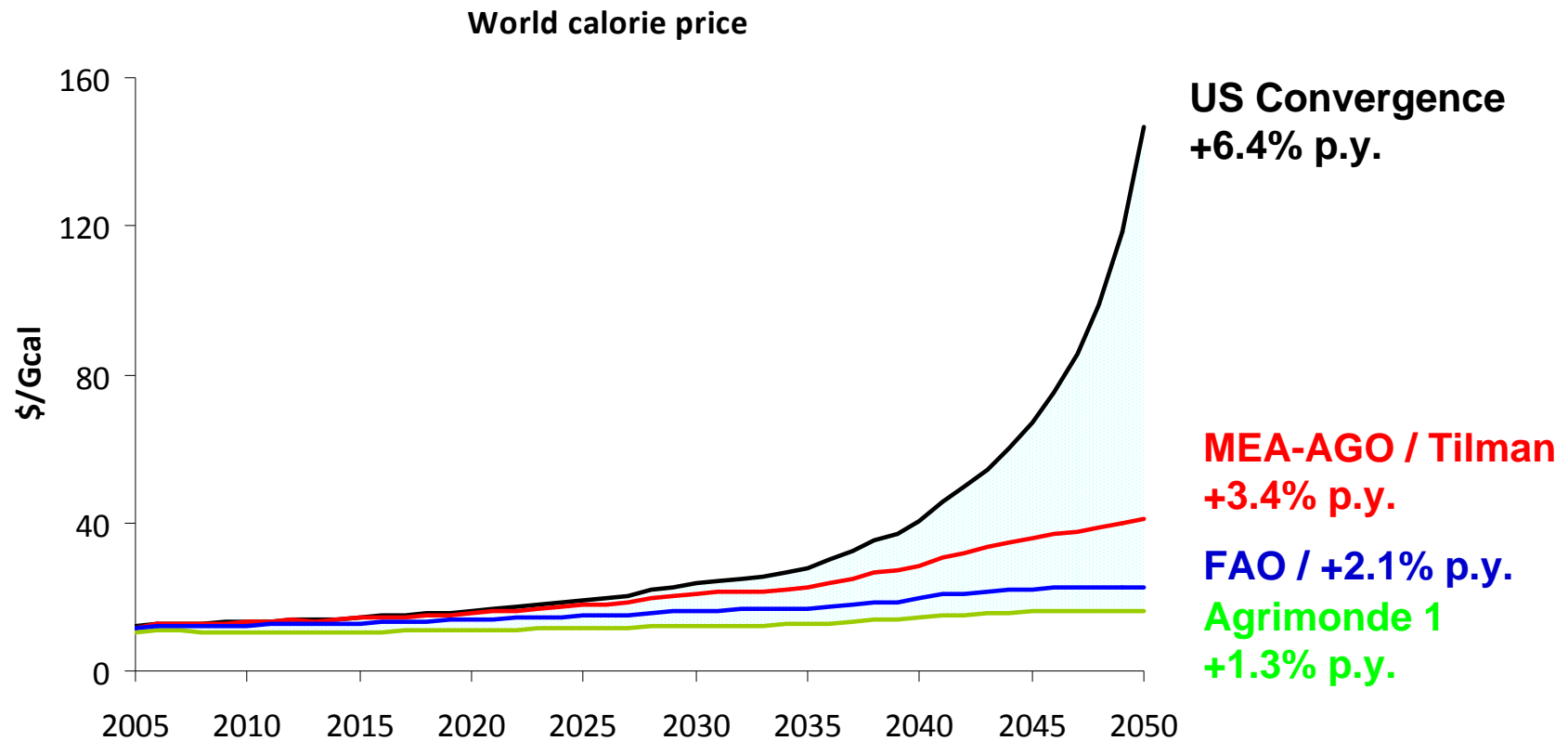
Nexus Land-Use model

- Biophysical parameters (e.g., potential yield, livestock model)
- Economic behaviours (cost minimisation)

Main scenario drivers

- US Conv / Global Orchestration / FAO / AG1 food scenarios
- Deforestation following past trends observed over 2001-2010
- No increase in potential yield
- No biofuel

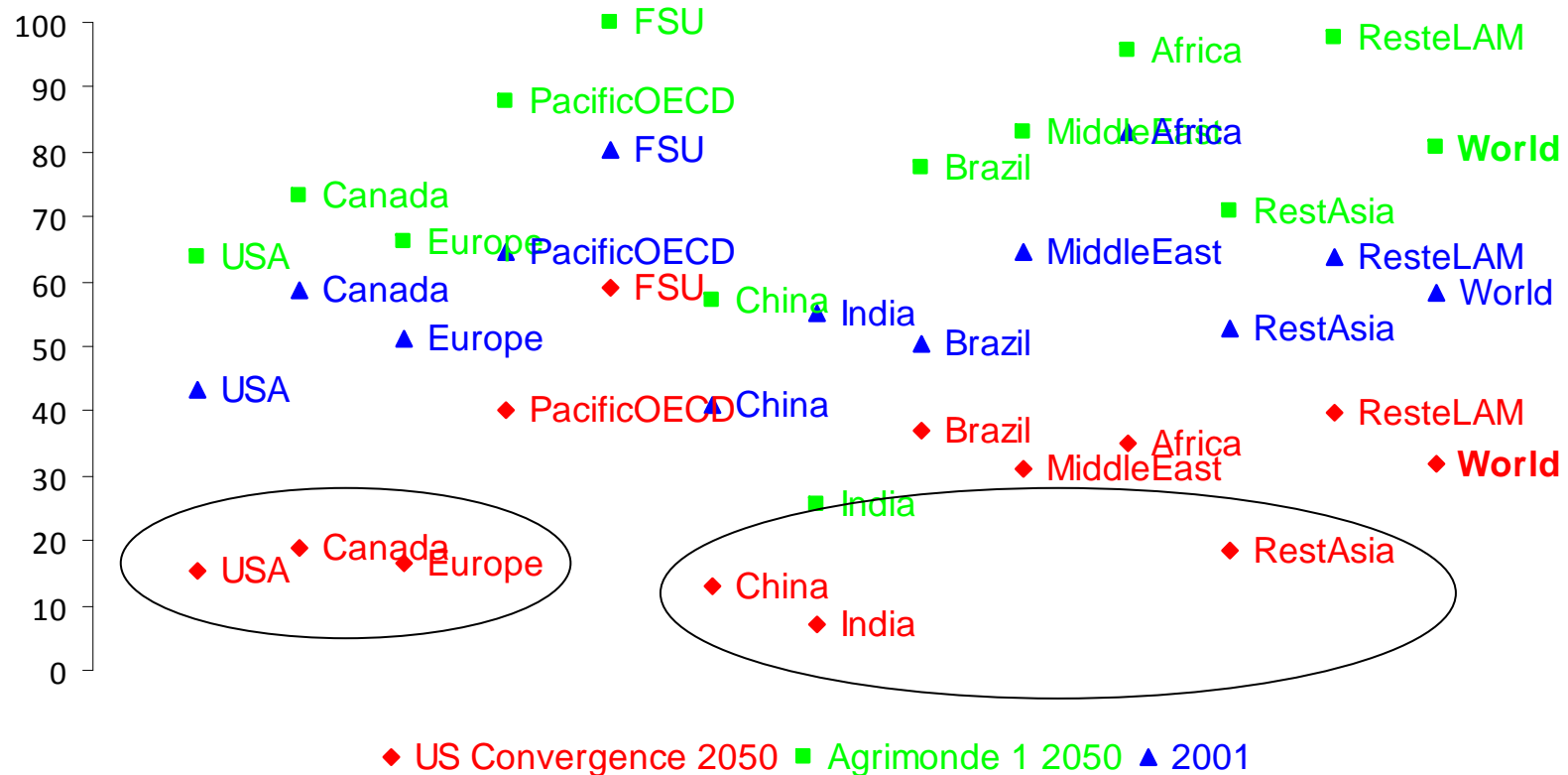
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How food scenarios impact agriculture?

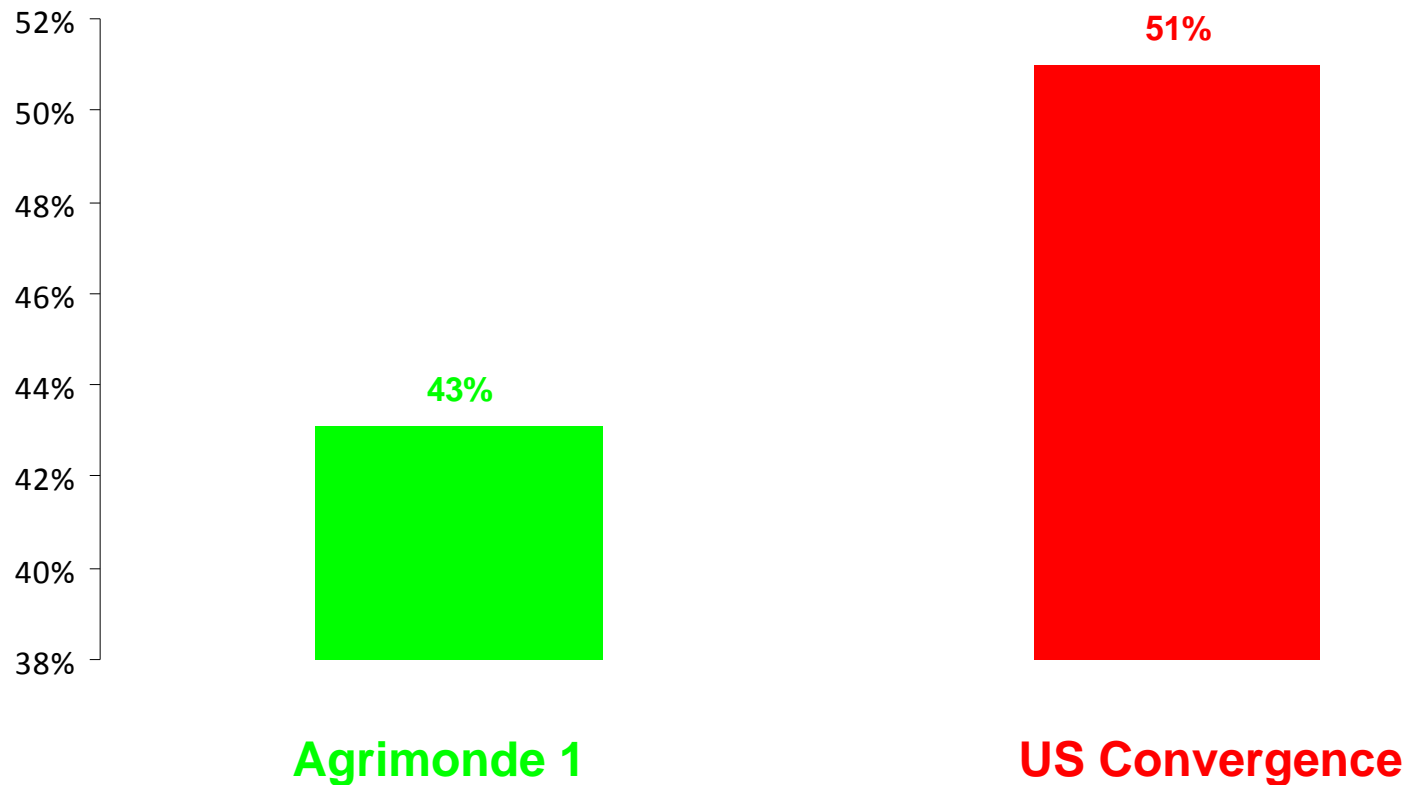
Yield gap (in %)

$$= (\text{Potential Yield} - \text{Actual Yield}) / (\text{Potential Yield} - \text{Min Yield})$$



How food scenarios impact agriculture?

Share of International Trade in Production



How food scenarios interact with other land-use policies?

Yearly evolution of the world calorie price

	Reference	(1)	(2)	(3)
Agrimonde G1	1.3%	1.4%	1.3%	1.0%
FAO	2.1%	2.3%	2.1%	1.7%
Tilman MEA / GO	3.4%	3.7%	3.7%	2.9%
US convergence	6.4%	7.9%	10.8%	5.6%

(1) Production of 50 EJ bioenergy (against 0 in reference)

(2) No Deforestation (against past trends in reference)

(3) Nutrient Use Efficiency improved by 20% (PNUD objective)

Conclusions

- Globalisation / economic convergence are explicit determinants of food scenarios in all projections to 2050
- Wide range of possible futures according to the degree of convergence
- An even wider range of impacts on agriculture
- Strong potential interactions with other land-use policies

Thanks for your attention