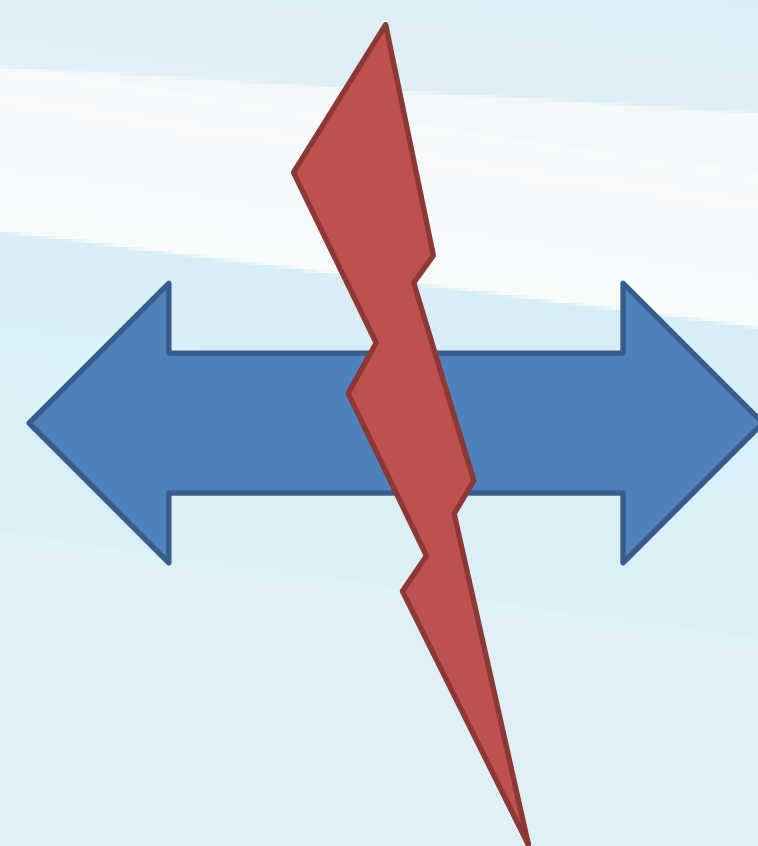


CONTEXT

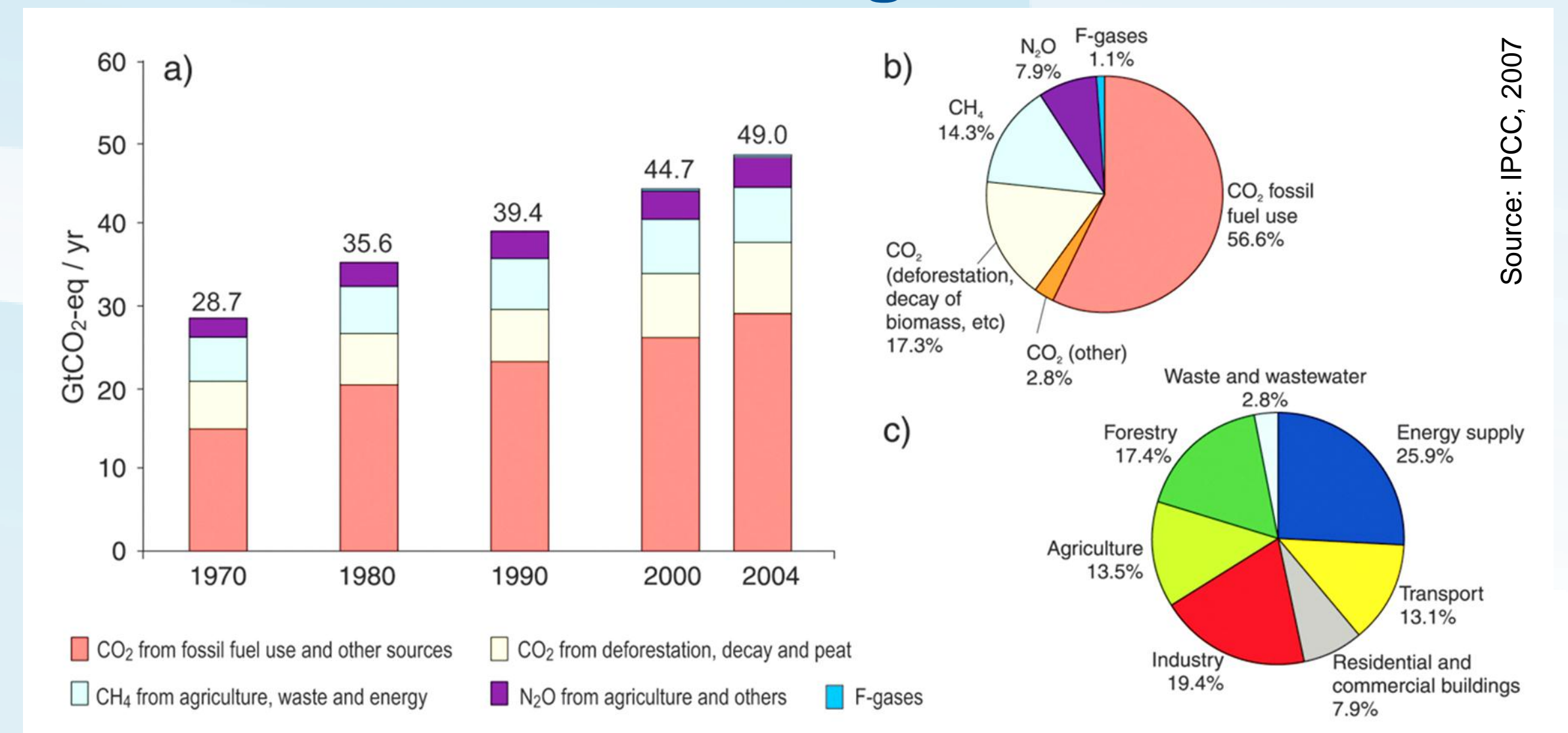
More food to feed future population

- Population: from 6.1 in 2000 to 8.4 billion in 2030
- +50% of average increase in agricultural production towards 2030 with **strong shift in consumption patterns** (Alexandratos, 2006)
 - +27% meat per capita, +17% milk and dairy per capita
- Expected land use expansion effect
 - +6 to 30% expansion up to 2050 (depends on demand and technology) (Smith et al., 2010)

conflicts with

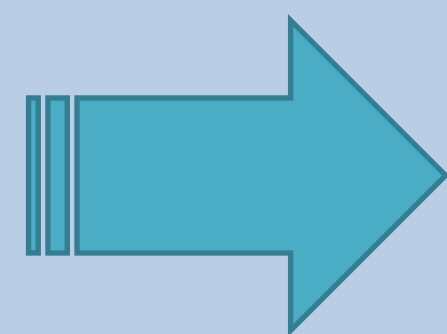


GHG emissions from agriculture and LUC



Mitigation in agriculture: Opportunity or false solution ?

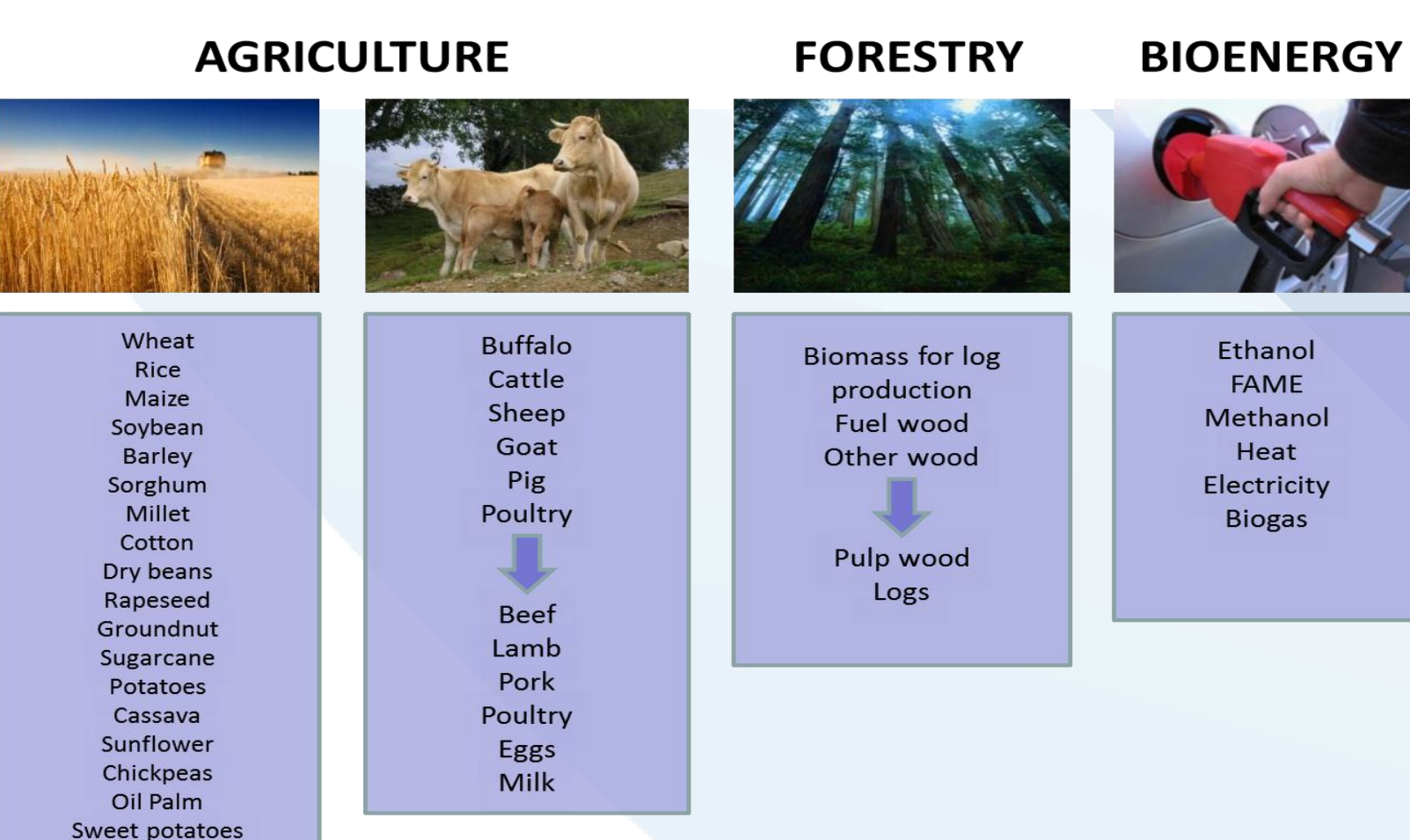
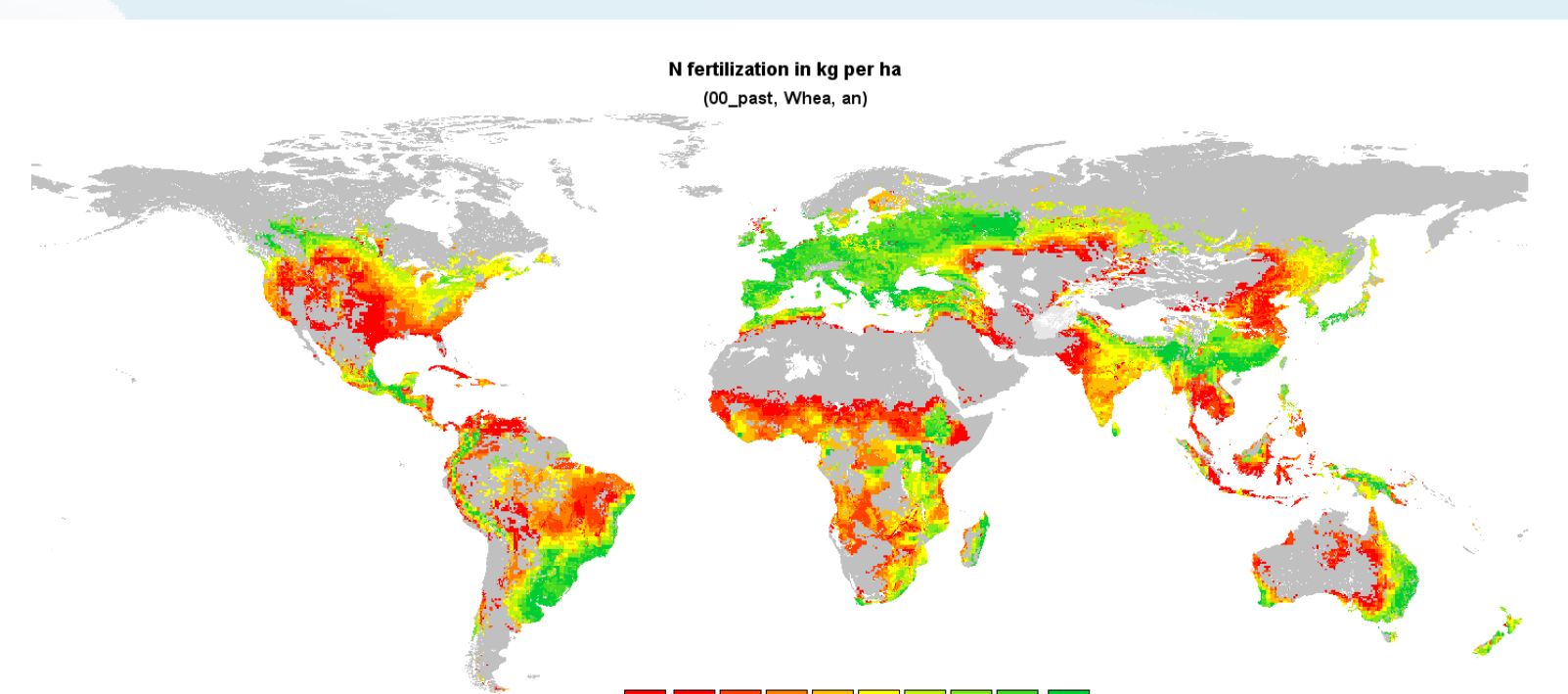
- For 20 USD / t:
 - 30% in agricultural activities (Smith et al., 2008)
 - 50% in forest anthropogenic emissions (Kindermann et al., 2008)



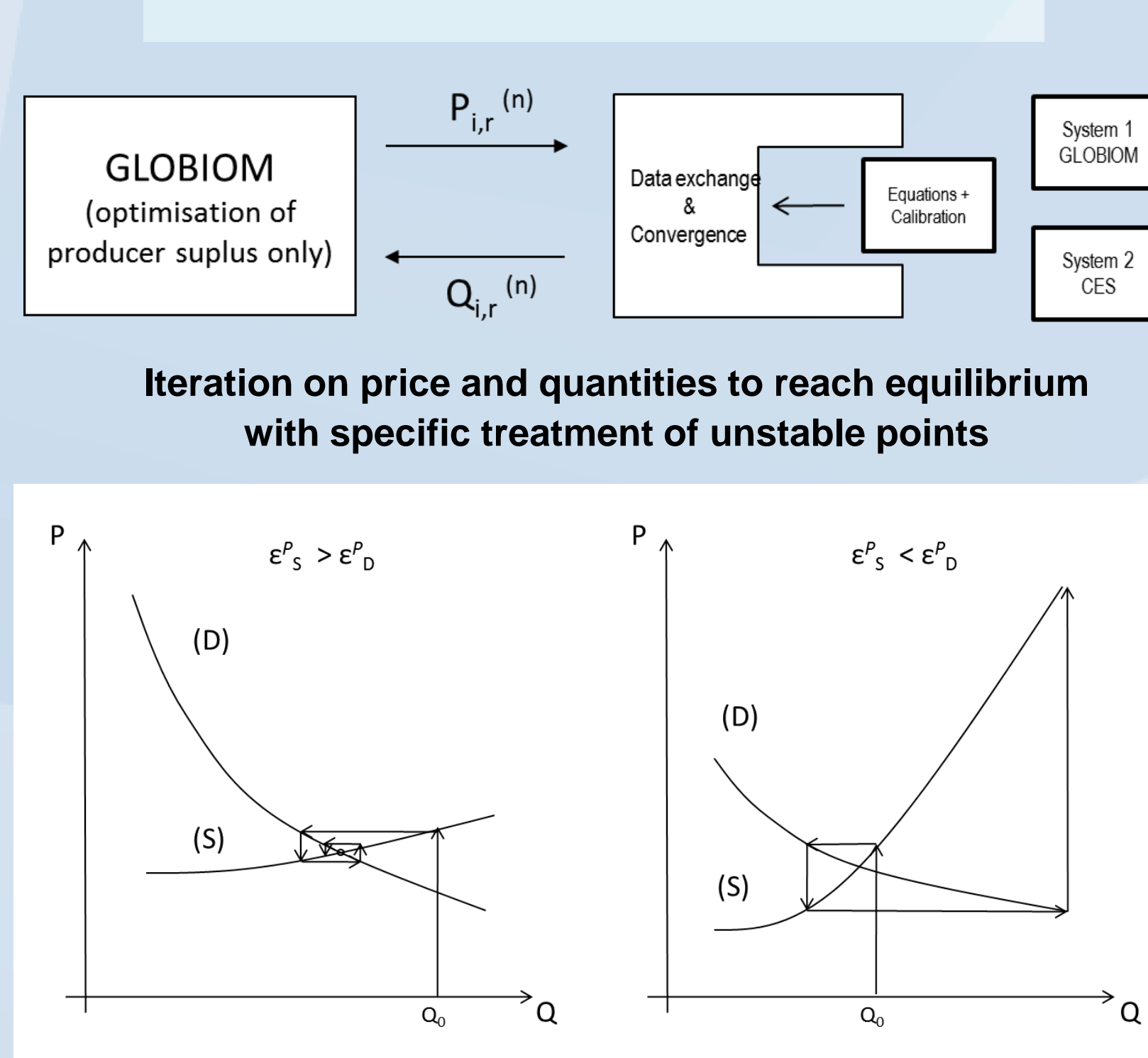
How can mitigation objectives conflict with food security considerations?

The supply side of GLOBIOM...

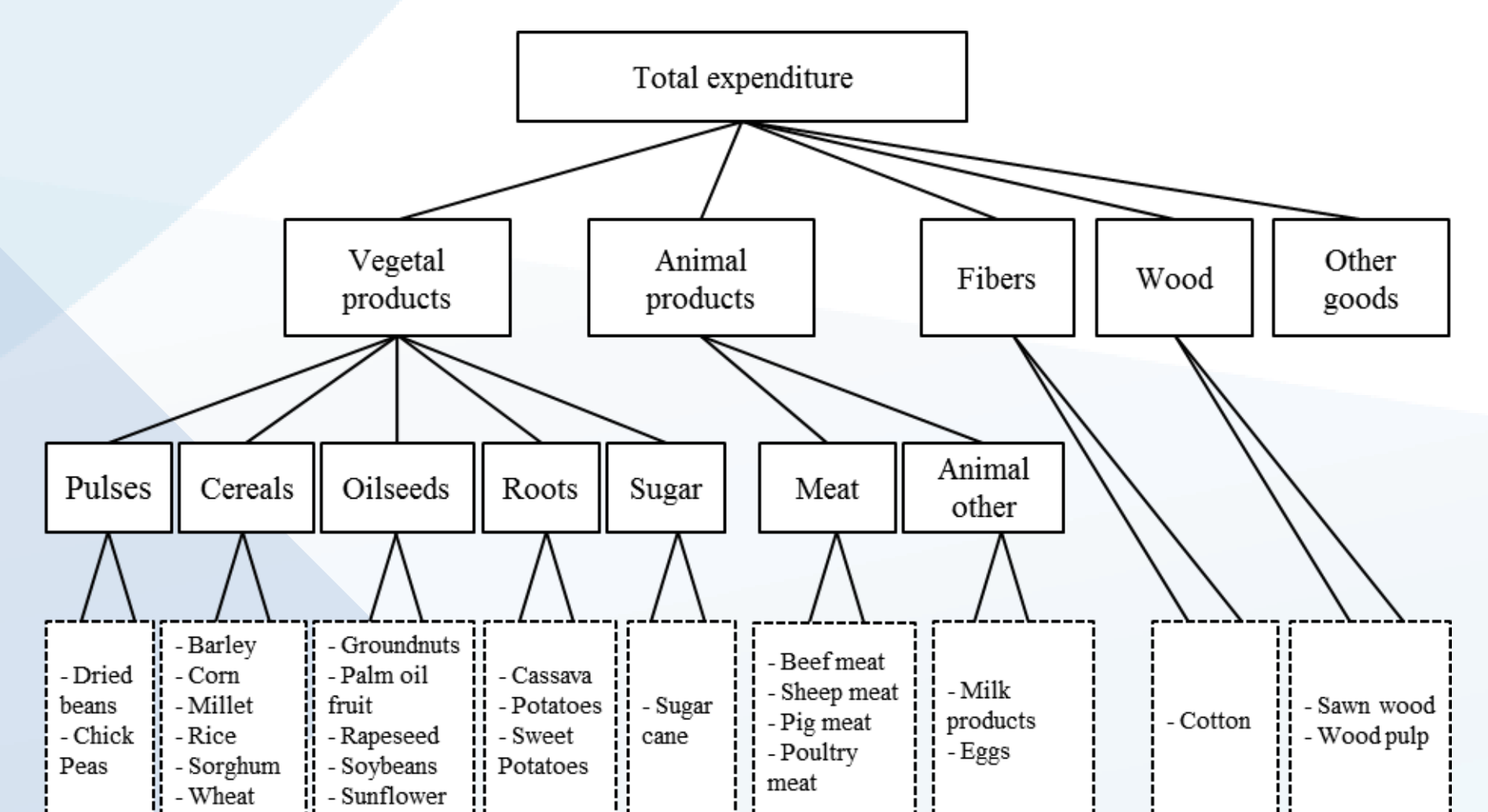
Bottom-up grid-based land use optimization model



INTEGRATED



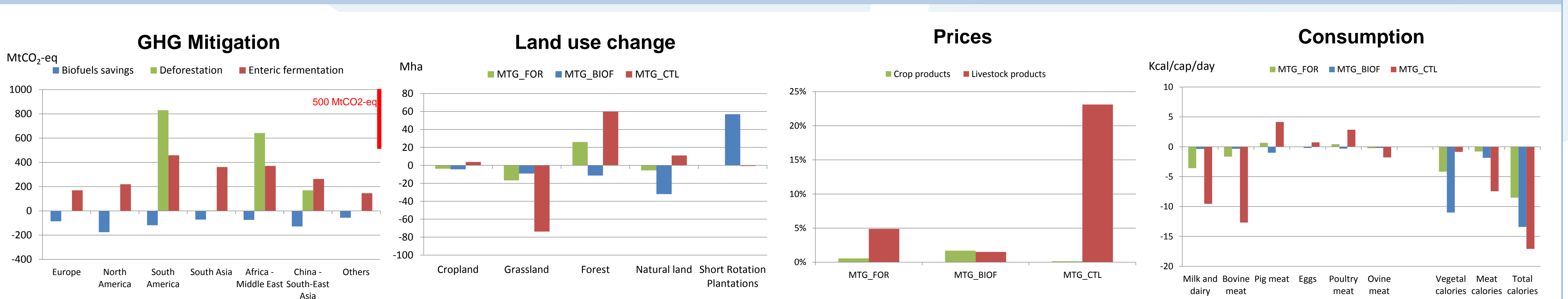
...with a flexible food demand system



- Nested LES-CES functions (Brown and Heien, 1972)
- Substitution effect (own and cross price elasticities)
- Non linear Engel curves (income elasticities)

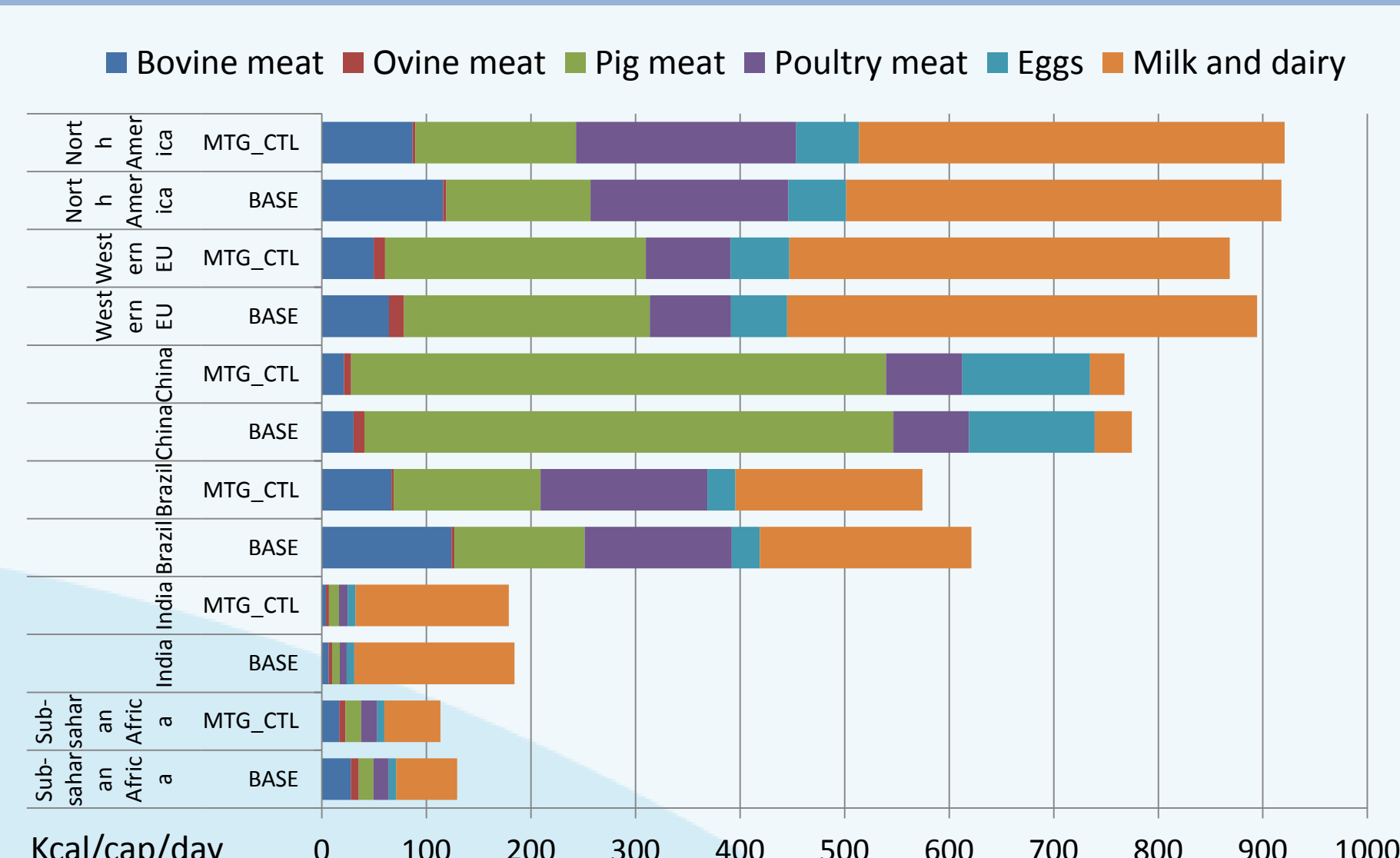
COMPARING EFFECTS OF THREE MITIGATION POLICIES

(1) Reduction of deforestation, (2) Bioenergy deployment, (3) Less methane emissions from livestock



WHY DIETS ACROSS REGIONS MATTER?

Consumption per capita in the livestock mitigation scenario



CONCLUSIONS

- Linkage between systems allows to better understand the **impact of supply oriented policies** on demand with the benefit or a refined bottom-up description
- The impact of mitigation policies reflect the hierarchy of mitigation costs:** preventing deforestation appears potentially better if not considering co-benefits of cattle intensification
- Impacts are very **differently distributed depending on the policies:** the most crop oriented could put at risk the poorest sensible to crop prices whereas meat based would impact more specific regions

REFERENCE

Valin, H., Havlik, Petr, Mosnier, A., Obersteiner, O. (2012) "Impacts of Alternative Climate Change Mitigation Policies on Food Consumption under various Diet Scenarios", Paper presented at the 14th GTAP Conference, 2012, Geneva.

ACKNOWLEDGMENTS: This work received the support from the following FP7 projects:

- PASHMINA (grant no. 244766)
- FOODSECURE (grant no. 290693)

Contact: valin@iiasa.ac.at More on the model: www.globiom.org