

Modeling ILUC with GLOBIOM

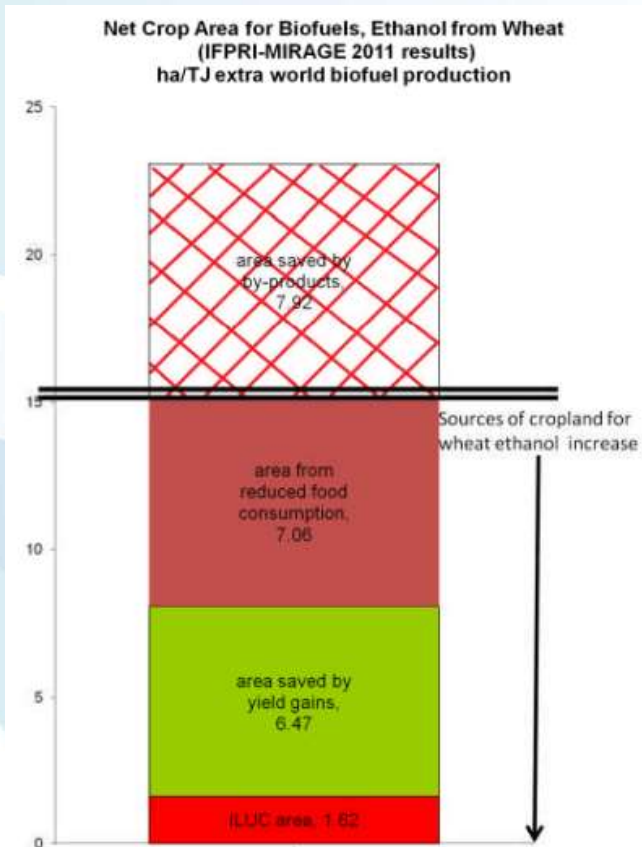
Support slides

Stakeholders meetings
November 2013

www.globiom-iluc.eu

Yield changes

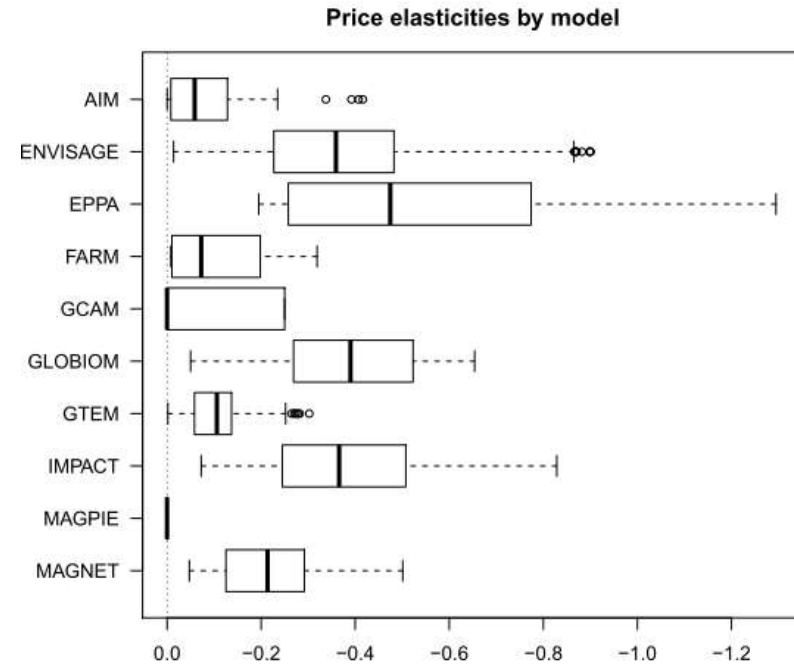
- ▶ Managed through three effects in GLOBIOM:
 - ▶ Technological change (exogenous)
 - ▶ Intensification/Irrigation (price response)
 - ▶ Reallocation (price response)
- ▶ Elasticity is not explicit in equations: need to be simulated
- ▶ To what value calibrate?
 - ▶ Benchmark US:
 - ▶ CARB expert group: 0.15-0.35
 - ▶ Huang and Khanna (2010): 0.06-0.43
- ▶ Sensitivity analysis required



Source: Searchinger, 2013

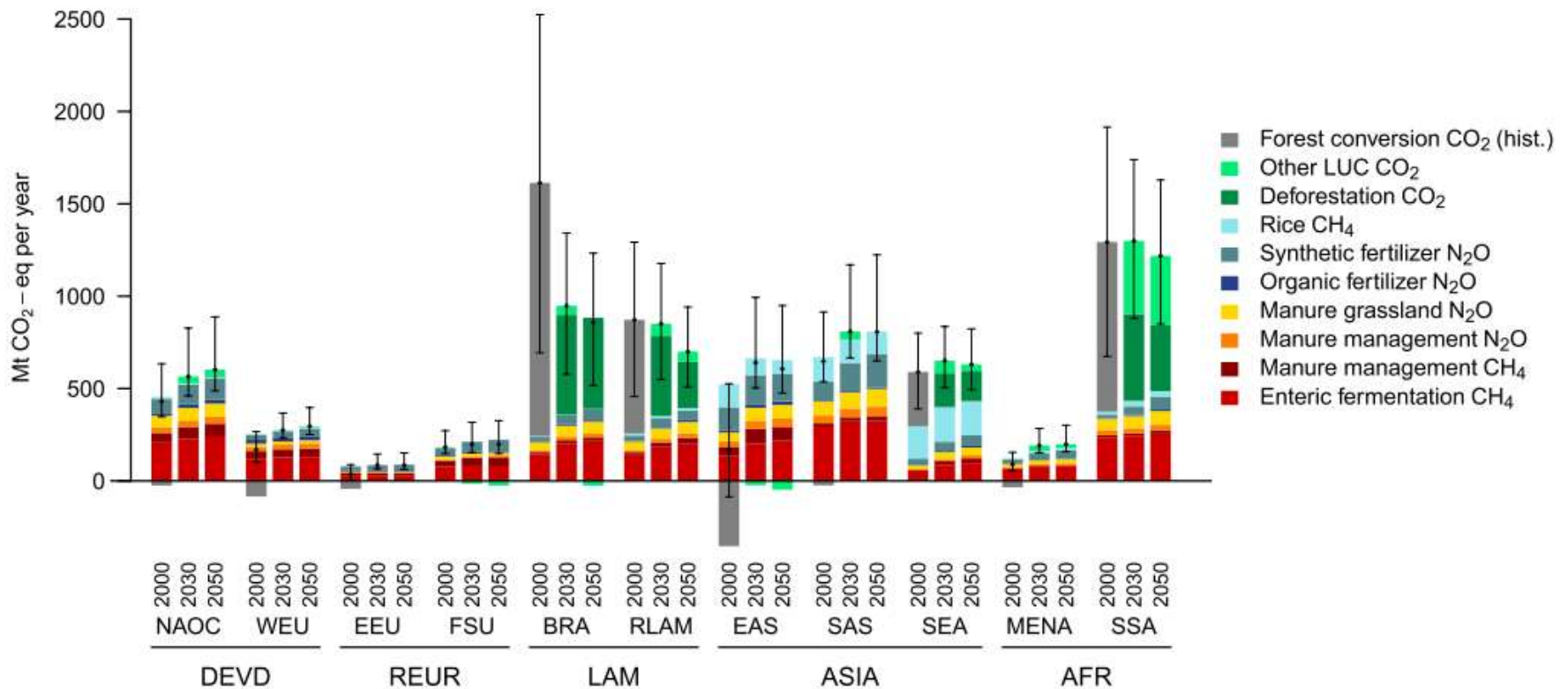
Change in food demand

- ▶ MIRAGE-BioF:
 - ▶ Demand managed at household level
 - ▶ Revenue effect
 - ▶ Own-price effect
 - ▶ Cross-price effects
- ▶ GLOBIOM
 - ▶ More constrained by structure (linear programming)
 - ▶ Only own-price effect
 - ▶ Imperfect substitution across some goods can be tested
- ▶ Calibrated on same set of elasticities (USDA)



Source: Valin et al., *Agricultural Economics*, in press

Deforestation patterns: example of a recent publication



Source: Valin et al., *Env. Res. Lett.*, 2013

Peatland

- ▶ IFPRI study assumption
 - ▶ 33% of palm oil plantation expansion going into peatland
 - ▶ 55 tCO₂/ha/year for drained peatland
- ▶ New evidence to refine these estimates?
(Currently, GLOBIOM relies on FAOSTAT emission factors)
- ▶ What assessment of uncertainty ranges?
- ▶ Current intuition:
A transparent simplified accounting rule would be more useful to structure the discussion than an endogenous modelling approach?

References

- ▶ Valin, H., Havlík, P., Mosnier, A., Herrero, M., Schmid, E. & Obersteiner, M. (2013). Agricultural productivity and greenhouse gas emissions: trade-offs or synergies between mitigation and food security?. *Environmental Research Letters* 8 (3), 035019. Retrieved from <http://stacks.iop.org/1748-9326/8/i=3/a=035019>.
- ▶ Valin, H., Sands, R. D., van der Mensbrugghe, D., Nelson et al., in press. The Future of Food Demand: Understanding Differences in Global Economic Models. *Agricultural Economics* 45 (1), 51-67.
- ▶ Searchinger, T. (2013). *Understanding the biofuel trade-offs between indirect land use change, hunger and poverty*. Woodrow Wilson School of Public and International Affairs, Princeton University. Report for Friends of the Earth.