GTAP-AEZ
(Land Use Model)

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WHAT IS GTAP AEZ?

An CGE economic framework:
• Multi region, multi sector, multi land
• For Detailed economic modeling of land use
• To account for the opportunity costs of alternative land uses/land based mitigation strategies
• To account for heterogeneous lands
The GTAP-AEZ Model: Heterogeneous Lands

- 18 Agro-Ecological Zones
  - 6 growing period (6 categories x 60 day intervals)
  - 3 climatic zones (tropical, temperate and boreal)
- The competition for land within a given AEZ across uses is constrained to include activities that have been observed to take place in that AEZ
- Within AEZ, land supply is constrained via a nested CET frontier
- AEZs are inputs into a single national production function for each commodity
Agroecological Zones
Land Demand in the GTAP-AEZ Model
Land supply: rent maximization

• Land does not move freely between alternative uses.
• Such movement is constrained by a Constant Elasticity of Transformation (CET) frontier
• A nested CET structure of land supply is implemented
• The rent-maximizing land owner first decides on the allocation of land among three economic uses/broad land cover types, i.e. forest, cropland and grazing land, based on relative returns to land.
• The land owner then decides on the allocation of cropland between various crops, again based on relative returns in crop sectors.
Land Supply in the GTAP-AEZ Model

\[ \Omega_2 = -1.0 \]

\[ \Omega_1 = -0.2 \]
Application

• impacts of climate change:
  • Draught
  • increase in productivity in some region
  • Decline in productivity in some region

• impacts of economic policy:
  • Land cover
  • Emissions

• ...