Representative Agricultural Pathways for Europe

Anne Biewald

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A short summary of SSPs
The new scenarios have three elements:

RCP = Representative Concentration Pathways → Climate Scenarios
SSP = Shared Socioeconomic Pathways → Socioeconomic Scenarios
SPA = Shared climate Policy Assumptions → Strategies and Policy Action
The 5 SSPs

- **SSP 1:** Low Challenges
  - Sustainability
  - Taking the Green Road

- **SSP 2:** Intermediate Challenges
  - Middle of the Road

- **SSP 3:** High Challenges
  - Regional Rivalry
  - A Rocky Road

- **SSP 4:** Adapt Challenges Dominate
  - Inequality
  - A Road Divided

- **SSP 5:** Mit Challenges Dominate
  - Fossil-fueled Development
  - Taking the Highway
Variables in 6 broad categories determine SSPs

• Demographics
• Human development
• Economy & Lifestyle
• Policy & Institutions
• Technology
• Environment & Natural resources
EU-RAPs are extended SSPs

• For many applications, „extended SSPs“ are likely to be required, containing additional and more detailed information for particular regions and sectors

• Extended SSPs should use assumptions that are consistent with the basic SSPs, but should support analysis that goes beyond the key variables

O’Neill et al. 2015, GEC
Developing the EU-RAPs

1. Define the objective

2. Identify key elements

3. Combine key elements

Adapted from O’Neill et al. 2015, GEC
1. Objective

Provide a description of future conditions that are relevant for the analysis of agriculture in Europe

1. Provide qualitative definition of European and agricultural specific pathways

2. Implement this pathways into agro-economic models (e.g. MAgPIE, CAPRI)
2. Identify key elements

- **Element considered in the SSPs**
  - Element sufficiently described, but not quantified
    - e.g. Globalization
  - Element sufficiently described and quantified
    - e.g. Population growth
  - Element not sufficiently described nor quantified
    - e.g. Diet and consumption

- **Element not considered in the SSPs**
  - e.g. Subsidies for agriculture, development of EU
Key element: Development of the EU

EU-SSP1:
• Further integration of European financial, fiscal and agricultural policies.
• Integration of new countries into the EU.

EU-SSP2:
• Middle of the road scenario.
• The EU will remain and continue to struggle.
• There will be EU-policies, but with a trend to decentralization.

Based on Kok et al. 2015
**EU-SSP3**

- A fragmented and divided Europe with strong regional rivalry and conflict.
- Eventually the EU will break down.

**EU-SSP4**

- The EU will consist of a small number of rich countries and become an important economic player.
- Poorer countries will drop out and become even poorer.

**EU-SSP5**

- Europe regains its leading position in the global economy.
- Strong EU, with focus on policies related to human and social capital, neglecting environmental protection.
# Key element: Agriculture

<table>
<thead>
<tr>
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<th>Relevant for the objective</th>
<th>SSP1</th>
<th>SSP2</th>
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<th>SSP4</th>
<th>SSP5</th>
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<tbody>
<tr>
<td><strong>Demographics</strong></td>
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</tr>
<tr>
<td>Population growth</td>
<td>Global agricultural demand</td>
<td>Relatively low</td>
<td>Medium</td>
<td>High (LIC)</td>
<td>Low (MIC, HIC)</td>
<td>Relatively low</td>
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<tr>
<td><strong>Economy and lifestyle</strong></td>
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<tr>
<td>Growth of GDP per capita</td>
<td>Global agricultural demand</td>
<td>High (LIC, MIC)</td>
<td>Medium</td>
<td>Slow</td>
<td>Medium (LIC, MIC)</td>
<td>High</td>
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- **Element not considered in the SSPs**
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<tr>
<td>International trade (Result of globalization)</td>
<td>Spatial distribution of production in- and outside Europe</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Strongly constrained</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Globalization (WTO-Doha round and bilateral trade agreements, and preference for regional production)</td>
<td>Connected markets, regional production</td>
<td>Semi-open globalized economy</td>
<td>De-globalizing, regional security</td>
<td>Moderate</td>
<td>High, with regional specialization in production</td>
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<td>Economy and lifestyle</td>
<td></td>
<td>Low meat diets, first in HIC specification: also low waste, and overall per capita consumption</td>
<td>Medium meat consumption specification: medium waste, per capita consumption</td>
<td>High per capita consumption in HIC, low per capita consumption in LIW, MIC</td>
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<td>High meat consumption specification: high waste, Per capita consumption</td>
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<td>Consumption and diet</td>
<td>Overall agricultural demand and regional distribution of production</td>
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<tr>
<td>Environmental Policy</td>
<td>Relevant for European and domestic environmental policies</td>
<td>Improved management of local and global issues</td>
<td>??</td>
<td>Low priority for environmental issues</td>
<td>Focus on local environment in MICs, HICs; little attention to vulnerable areas or global issues</td>
<td>Focus on local environment</td>
</tr>
<tr>
<td>Policy orientation</td>
<td>Relevant for CAP and nat. policies</td>
<td>Strong focus on sustainable development</td>
<td>Weak focus on sustainable development</td>
<td>No focus on sustainable development</td>
<td>Strong focus in HIC, MIC; no focus in LIC</td>
<td>Weak focus on sustainable development</td>
</tr>
<tr>
<td>Institutions</td>
<td>Relevant for CAP and nat. policies</td>
<td>Effective</td>
<td>Medium effective</td>
<td>Not effective</td>
<td>Effective only in HIC, MIC</td>
<td>Effective</td>
</tr>
<tr>
<td>European and domestic agricultural policy (CAP)</td>
<td>Agricultural production in Europe</td>
<td>To be discussed later</td>
<td></td>
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<tr>
<td>Development</td>
<td><em>Increases in productivity</em></td>
<td>Rapid</td>
<td>Medium</td>
<td>Slow</td>
<td>Rapid in HIC, MIC, Low in LIC</td>
<td>Rapid</td>
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<tr>
<td>Land use (Forest protection, nature conservation)</td>
<td><em>Agricultural land expansion</em></td>
<td>Strong regulations</td>
<td>Medium regulations</td>
<td>Hardly any regulations</td>
<td>Hardly any regulations (MI, HI): Lack of regulation (LI)</td>
<td>Medium regulations</td>
</tr>
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Combining EU-SSPs and the CAP

• EU-RAP1: Strong CAP, strong focus on environmental regulation (e.g. greening), no producer support (direct payments).
• EU-RAP2: BAU
• EU-RAP3: EU breaks up, rich countries support farmers with national subsidies, poor countries do not, no CAP.
• EU-RAP4: In the remaining small and rich EU, a strong CAP. In the singled out poor countries – no CAP, no domestic subsidies.
• EU-RAP5: Free market world, strong institutions, strong EU. No CAP.
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<td>European agricultural policy (CAP)</td>
<td><em>Agricultural production in Europe</em></td>
<td>Strong CAP</td>
<td>Middle of the road</td>
<td>None</td>
<td>Strong CAP in EU, none in rest of Europe</td>
<td>None</td>
</tr>
<tr>
<td>Basic Payment Scheme (Pillar I)</td>
<td><em>Agricultural production in Europe</em></td>
<td>None</td>
<td>As currently</td>
<td>None</td>
<td>Strong in EU, none in the rest of Europe</td>
<td>None</td>
</tr>
<tr>
<td>Greening (Pillar I)</td>
<td><em>Agricultural area, production, SI measures</em></td>
<td>Strong focus</td>
<td>As currently</td>
<td>None</td>
<td>Exists in EU, not in the rest of Europe</td>
<td>None</td>
</tr>
<tr>
<td>Disaster funds (Pillar I)</td>
<td><em>Agricultural production in Europe</em></td>
<td>Exists</td>
<td>As currently</td>
<td>None</td>
<td>Strong in EU, none in the rest of Europe</td>
<td>None</td>
</tr>
<tr>
<td>Rural development scheme (Pillar II)</td>
<td><em>Promotion of SI measures</em></td>
<td>Exists, shift to sust. issues</td>
<td>As currently</td>
<td>None</td>
<td>Exist in EU, not in the rest of Europe</td>
<td>None</td>
</tr>
<tr>
<td>Part of Pillar II that goes to the environment</td>
<td><em>Agricultural production in Europe</em></td>
<td>Large</td>
<td>As currently</td>
<td>None</td>
<td>Exist in EU, not in the rest of Europe</td>
<td>None</td>
</tr>
<tr>
<td>National agricultural policy</td>
<td><em>Agricultural production in Europe</em></td>
<td>No domestic policies</td>
<td>Weak domestic policies</td>
<td>Strong domestic policies in HIC</td>
<td>No domestic policies in EU, weak agr.pol in the rest of Eur.</td>
<td>No domestic policies</td>
</tr>
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Thank you!

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Outlook

• Combining the EU-RAPs with SPAs and RCPs (following the Lotze-Campen et al.)
• Iterating the assumptions with different project partners
• Quantifying the assumption and implementing them in CAPRI, MAgPIE, ...
Regional focus: Europe-specific SSPs

developed in the FP7 project IMPRESSIONS:

EU-SSP1: We Are the World
EU-SSP3: Icarus
EU-SSP4: Riders on the Storm
EU-SSP5: Fossil-fuelled development

Instead of challenges to mitigation and adaptation, the key uncertainties identified were carbon intensity per unit GDP and inequality.