Modelling European Agriculture with Climate Change for Food Security

MACSUR for policy support

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Rationale for the topic

- Governing Board of FACCE-JPI invited MACSUR to make explicit how MACSUR1 has supported policy of the funding bodies
- MACSUR offers modelling across different scales, disciplines and contexts, using a transdisciplinary approach. We assess policy impacts until 2040/2050

Take-away message

- Align mitigation and adaptation measures with agricultural support and environmental measures, removing unpriced emissions

Impact of climate change for European agriculture

CAPRI projects agricultural supply in Europe will decline by 2050 by 7-14%, with considerable variation across regions. Medium-large farms in the North Savo region in Finland might benefit because of the skills and scale of production, to adequately adapt. Availability of irrigation systems is critical for agriculture in the Mediterranean region to adapt to CC

Climate change and CAP payments

- The increasing productivity of crop production from climate change increases the opportunity costs of agri-environmental payments in Austria

Mitigation in animal production

- Animal production has a share of 9% of total greenhouse gas emissions in Europe. Methane emissions from dairy might be reduced by 40%. MACSUR compares emission reduction potential from mitigation versus changes in diets.

From resource efficiency to a circular economy

- EC has shaped an initiative towards a resource-efficient Europe
- Resource use efficiency, producing more of a given service while using less natural resources is in pursuit of the EU 2020 vision of ‘smart, sustainable and inclusive’ growth
- Align mitigation measures with nutrient management

Agriculture in a circular economy

- Agriculture, closing production cycles, to operate within environmental limits and climate-proof production systems
- MACSUR offers perspectives for action, addressing external effects, closing nutrient cycles and respond to climate change

Circular economy in agriculture - 1

Climate change might reduce production potential of sugar beet in the Mediterranean region. This potentially strengthens the competitive position of arable farming in North-western Europe. The region has excess amounts of nitrogen from animal production system and the technology is available to recover nutrients and produce fertilizers

Circular economy in agriculture - 2

The production potential of soya might increase in Central Europe (e.g. Austria and Bulgaria), enabling to replace the import of soya from Latin America and US. Pig produced in Europe might increasingly be fed by European soya, reducing external effects in regions with high density of animals.

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