



Methoden für eine evidenzbasierte Agrarpolitik - Erfahrungen, Bedarf und Entwicklungen

Methods for an evidence-based agricultural policy -
Experiences, demand and new developments

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Protocol-based storylines for integrated assessments of future European agriculture

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Abstract – *Integrated assessments in agriculture often necessitate storylines to define socio-economic framework assumptions. They are available at global to continental scales but their spatial resolution and scope is insufficient for sectoral studies in agriculture at national to regional scales. We therefore aim at developing protocol-based storylines for European agriculture by extending and enriching global storylines. Consistency across spatial scales and sectors related to agriculture are maintained by following a nested approach. Stakeholders contribute to the research process in order to ensure usefulness and usability of the results. We present the innovative research design to generate storylines for European agriculture and give examples of storyline elements. The shared protocol increases transparency of how storyline elements are identified, prioritized and combined, improving comparability and consistency of integrated assessments within and across scales.*

INTRODUCTION

Integrated assessments at various spatial scales typically require storylines to specify underlying framework assumptions such as agricultural policies or prices for intermediary products and agricultural outputs. The climate change research community developed such storylines, known as Shared Socio-economic Pathways (SSPs), which are available at global to continental scales (Kriegler et al., 2012; Kok et al. 2018). The five contrasting SSPs describe major socio-economic developments and are used to parameterize integrated assessment models at large spatial scales. They can be linked to the Representative Concentration Pathways (RCPs) which are typically used for climate impact modelling. A major challenge to apply SSPs and RCPs in integrated

assessments on agriculture under climate change, however, is the mismatch in spatial scales and scope. The spatial resolution of SSPs and the level of detail with respect to socio-economic processes is insufficient for studies at national to regional level and for specific questions such as technology adoption.

A solution to this problem is to downscale and enrich SSPs to the level of concern. For instance, Valdivia et al. (2014) have developed the concept of Representative Agricultural Pathways (RAPs). Mathijs et al. (2018) present detailed storylines on the European food sector, which are based on SSPs. Nevertheless, these examples either remain at the conceptual level, are not fully consistent with SSPs or lack the details and scope necessary for many applications in Europe.

Multiple and uncoordinated bundles of storylines emerging in parallel create risks and miss opportunities. Risks include potential inconsistencies between the studies that apply storylines of different origins. Stakeholders may lack understanding and eventually get lost in a multitude of contrasting and potentially conflicting interpretations of SSPs, which may hamper decision making. A missed opportunity is to bundle research resources in order to create broadly accepted storylines available to the academic and non-academic communities.

The FACCE JPI knowledge hub MACSUR (www.macsur.eu) offered a networking platform to researchers interested in climate change studies in agriculture. Researchers from this network and others with similar interests are collaborating to jointly develop agricultural storylines at the European level, i.e. European Agricultural SSPs (EUR-Agri-SSPs) that are fully consistent with the global SSPs. Here, we present the research method to achieve such qualitative, explorative storylines as well as first results.

METHODS AND DATA

The stylized research design for defining EUR-Agri-SSPs is presented in Figure 1. It follows a nested approach from global to national levels, as suggested by Rosenzweig et al. (2016). Storyline elements are defined by combining inputs from stakeholders acting at the European level and results from a comprehensive literature review on existing storylines and potential future trends in land use. A database is

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established to summarize and structure relevant storyline elements derived from the stakeholder process and the literature, which may be updated with insights from ongoing storyline development processes at regional or sub-sectoral levels. Contrasting qualitative, explorative storylines are constructed for European agriculture until 2050 by combining single storyline elements (i.e. drivers), whereby vertical consistency (i.e. EUR-Agri-SSPs are consistent with global SSPs) and horizontal consistency (i.e. consistency between storyline elements within a spatial entity) are essential.

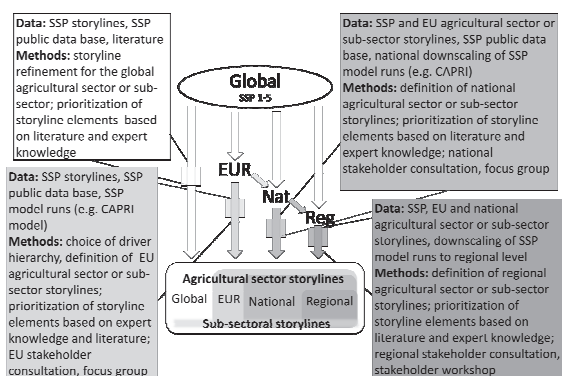


Figure 1. Stylized research design for EUR-Agri-SSPs. Source: adapted from Schönhart et al. (2017)

Stakeholder engagement and contribution is crucial in the storyline development process to ensure that the thematic focus and selected storyline elements are legitimate, relevant, and useful in policymaking and research. Stakeholders have been selected by the team of researchers with the aim that a diversity of interests and positions related to the European agricultural sector is represented. Diversity is, e.g., reflected by involving non-scientific stakeholders from public, private, and non-governmental organisations or institutions who may apply storylines but mainly are in charge of interpreting and validating research results, and scientific stakeholders who may use the storylines for research methodologies.

RESULTS AND DISCUSSION

Global or European SSPs underlie global, European, national and regional storylines, among others, for the agricultural sector. Some storyline elements defined in the global SSPs (e.g. energy costs) immediately inform global agricultural sector storylines and are not variable across space, as indicated by the first arrow from global SSPs to agricultural sector storylines in Figure 1. Other elements drive European level processes. For example, the EU Common Agricultural Policy (CAP) has continuously been adjusted to changes in international market conditions, trade standards and societal concerns. Some CAP regulation (e.g. direct payment schemes and greening requirements) as well as other EU policies (e.g. environmental legislation) are similar in most member states. This is indicated by the second column of arrows from global SSPs to EUR-Agri-SSPs. Other elements vary between member states due to local peculiarities and can be driven by socio-economic, cultural and geo-biophysical conditions or any policies interfering with agricultural policies. For

instance, CAP Rural Development Programmes are adjusted to national and regional circumstances. This is indicated by the third and fourth columns of arrows. The first two columns contribute to the definition of the EUR-Agri-SSPs and are thus the focus of the joint research effort and this presentation. Major challenges in defining EUR-Agri-SSPs are the detection of drivers active at European level beyond EU boundaries and the specification of these drivers. They must be consistent within a single EUR-Agri-SSP, but contrasting among them. Drivers shall be detailed enough to inform integrated assessment tools without forestalling its results.

CONCLUSIONS

Many drivers influence the European agricultural sector. Therefore, a shared storyline definition of European developments form the basis for national, regional and sub-sectoral storylines. This would make national and regional studies more consistent and comparable and can save resources in research processes. It can facilitate a structured and goal oriented dialogue within the scientific community and beyond and prevent stakeholder fatigue from a large number of inconsistent storylines developed in parallel.

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