

Linking the Safe Operating Space to agri-environmental policies in the European Union

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The concept of the planetary boundaries has gained increasing attention since its introduction in 2009. It defines a safe operating space for humanity where the risk of destabilization of the earth system is low. Food production is strongly linked to several critical earth system processes such as land-system change or biochemical flows. EU agri-environmental strategies and policy measures contain environmental quality and action targets linked to the different earth system processes, reflected for example in the Farm to Fork strategy or the EU Nitrates Directive. In this master thesis, the student should develop and apply a conceptual framework to map existing EU agri-environmental policies to the concept of a safe operating space. This requires amongst others gaining a comprehensive overview of current agri-environmental policy measures and strategies as well as environmental monitoring. For selected boundaries with high relevance to agriculture, the master thesis should address to what extent policy goals are or can be matched to the science-based boundaries. The latter need to be systemized according to categories derived from a literature review. Finally, possible shortcomings in agri-environmental policies should be discussed in the context of the safe operating space. To understand the literature in the field of earth system science, a background or interest in natural sciences is required.

Reference to start:

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- Biermann, F., Kim, R.E., 2020. The Boundaries of the Planetary Boundary Framework: A Critical Appraisal of Approaches to Define a “Safe Operating Space” for Humanity. *Annual Review of Environment and Resources* 45, 497–521. <https://doi.org/10.1146/annurev-environ-012320-080337>.
- Dearing et al. 2014. Safe and just operating spaces for regional social-ecological systems. *Global Environmental Change* 28, 227–238. <https://doi.org/10.1016/j.gloenvcha.2014.06.012>