

The Impacts of Agri-Environmental Policies on Multiple Planetary Boundaries

January 2026

Preliminary draft. Please do not cite or circulate.

Abstract

Agriculture is a leading driver of global environmental degradation, contributing to the transgression of several planetary boundaries. Governments have implemented diverse agricultural environmental policies, but their effectiveness across multiple environmental dimensions as well as their interactions remain largely unclear. This study provides the first global, multi-dimensional assessment of agricultural policies, combining a comprehensive policy database with panel data on key environmental indicators. Using a generalized difference-in-differences framework and machine-learning-based structural break detection, we identify policies that induce significant changes in environmental damage trajectories and evaluate their trade-offs. Preliminary results reveal heterogeneous policy impacts, with market-based interventions appearing particularly effective in mitigating environmental pressures. Institutional factors are evaluated in their relevance for policy effectiveness. Our findings aim to offer actionable insights for aligning agricultural production systems with environmental sustainability goals.