**Doctoral Thesis Exposé**

*Preliminary title:*

Integrated assessment of the coherence of current climate & land use policy mixes at different spatial scales

November xxth, 2019

**Submitted by: Supervised by:**

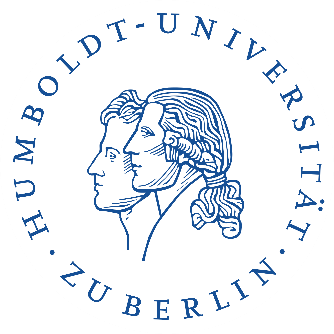
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# Motivation

* 1. Land use Global Outlook and current pressures

Modern agriculture has reshaped our world in ways rarely seen before in history. The introduction of energy-intensive farming in the early 1900s made it possible for food production to keep up with the growing population. However, this intensification led to the coverage of half of the world's surface area by cultivated crops; pasture grazed by domestic animals and production forests. This, unprecedented, direct human alteration of ecosystems has been environmentally devastating at local, national and global scales 1.

The global demand for land keeps continuously increasing. This growth is currently driven by land-intensive nutrition of a growing population; a shift back to crop-based bioenergy fuels; expansion of human settlements; stabilization of ecosystems by biodiversity preservation; and carbon sequestration through afforestation 2.

Numbers land coverage

Pressures

* 1. Policy mixes

The appropriate design and implementation of diverse climate and land-use policies, at regional and even continental scale, can contribute to climate adaptation and mitigation. Policies can potentially enhance the optimal management of resources, social resilience, and ecological restoration 3. With this in mind, policies should be mutually supportive and aim to bring together different stakeholders to reduce the risks and barriers to implementation.

Policies relevant to climate and land-use usually address food security (availability, access, utilization, stability of food and social protection), land degradation and desertification (land degradation neutrality, land-use zoning, conservation of biodiversity and ecosystem services, standards and certification for sustainability of biomass and land-use sectors), sustainable land management, climate-related extremes (droughts, fires, floods), and GHG flux for climate change mitigation4.

Policy mixes have emerged as a dynamic way to achieve policy objectives. The design and assessment of the later involve a clear understanding of the objectives of the policy mix, the interplay of its components, its interaction with exogenous variables, its dynamic nature to solve complex problems, and the expected outcomes (benefits and trade-offs) 5. Even though the benefits of policy mixes is very well know, ***there is still a gap in the integrated consideration and evaluation (trade-offs and synergies) of environmental, climate change (adaptation and mitigation), agriculture, and sustainable development policies*** 6.

* 1. Sustainability in a telecoupled world

# Research Questions

Considering that a gap has been identified in the consideration of comprehensive climate, land use, trading, and development policy mixes, three main research questions have been identified:

1. How do the current policy instruments used to deal with climate, agricultural and development pressures interact with each other, and what is their coherence based on national and regional sustainability targets?
2. In the global market, what are the current and projected local environmental and land-use impacts due to consumer-producer trading interactions?
3. Which policy mix would be needed by an international coordination system to efficiently manage global land use based on biodiversity, food security, and telecoupled land demand?

# Methodology

Mention MAgPIE generalities, which changes I’m going to make.

# Tentative timeline

The timeline to be able to achieve the research goals is described below.



# References

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