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PhD Project:
Expansion in Aquaculture: Sustainability, Land Use and Regulation

Background
The global population is projected to reach 9.6 billion by 2050 according to the UN statement. Being the fastest growing food producing sector, aquaculture has the potential to provide good-quality nutrition and meet increasing future food demand. Many studies have emphasized the importance of the aquaculture sustainability and been working on the alternative plant-derived ingredients to replace aquafeeds made of fish meat (FM) and fish oil (FO). However, the consequent land use change has rarely been mentioned. The competition for land - direct use for aquaculture and through feed production - and restrictive regulations may limit the expansion of aquaculture.

Research objective and methodology
The aim of this dissertation is to explore and quantitatively assess the interdependencies between a growing aquaculture sector and its demand for land. What is the land use generated by aquaculture? Where does it occur? What are the consequences in terms of food and nutrient availability, competition for land with other land uses and environmental sustainability? And what kind of political regulation is needed? A first step for achieving this aim is to give an overview of the relationship between aquaculture and land use and how it can be methodologically assessed, e.g., in current global economic and fishery models.

After giving the literature review of the expansion of aquaculture and its resulting land use, it is planned to implement aquaculture into the Common Agricultural Policy Regionalized Impact modeling system (CAPRI) by establishing the linkage between aquaculture and agriculture. This will enable the impact assessment of food system drivers (policy, population and GDP growth, climate change) on land use, food and nutrient availability, food prices, and sustainability of both aqua- und agriculture.