FUNCTIONAL LAND MANAGEMENT MODEL – A TOOL FOR SOCIO-ECONOMIC EVALUATION OF CLIMATE CHANGE MITIGATION MEASURES

In the face of climate change, sustainable land management has become a critical focus, especially in regions where nutrient-rich organic soils are prevalent. These soils, often found in drained forests, fens, and mires in the Baltic States and Finland, play a significant role in greenhouse gas emissions. However, they also offer considerable potential for carbon storage, depending on how they are managed. To address this, the LIFE OrgBalt project has developed the Functional land management model – a microeconomic model for public-private cooperation (PPC model). That is a comprehensive tool designed to assess socio-economic and financial impacts of various land management practices.

The PPC model is more than just a tool for calculating greenhouse gas reductions; it provides a detailed economic analysis of different land use scenarios, offering insights into the costs, benefits, and necessary investments associated with sustainable practices. This microeconomic model allows landowners, policy planners, and other stakeholders to make informed decisions about land use, balancing financial returns with environmental benefits.

Understanding the PPC Model

At its core, the PPC model evaluates climate change mitigation (CCM) measures implemented in Latvia and Finland. There are 17 demonstration sites (demonstration "Introduction of legumes in conventional farm crop rotation" is located in two sites – LVC304 (a) in Lazdiņi and LVC304 (b) in Slampe) in agriculture and forest land. These measures are applied to various types of land, including agricultural, forest, and wetland areas, and are assessed based on specific criteria related to land type, use, management systems, and drainage systems. The model processes these inputs to generate financial, economic, and socio-economic indicators for each scenario.

For instance, the model evaluates the costs associated with afforestation – a process that can take decades to yield significant financial returns. The PPC model considers these long investment periods and helps users determine whether public funding will be necessary to make such projects financially feasible. This is particularly important for long-term measures like afforestation and continuous cover forestry, where the initial costs are high, but the long-term benefits in terms of carbon sequestration and ecosystem services are substantial.
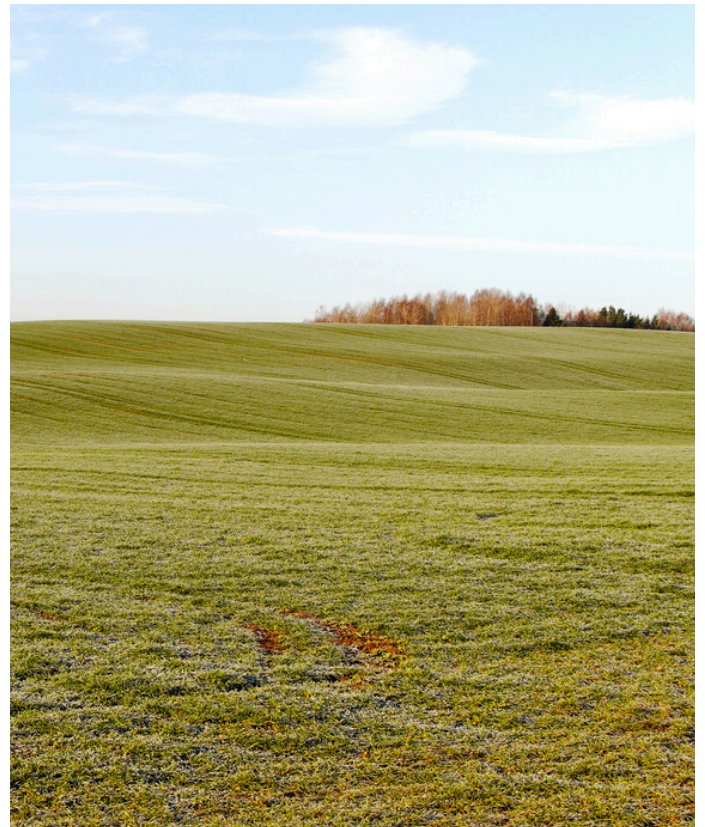
Socio-Economic Benefits

Beyond financial returns, the PPC model also assesses the broader socio-economic benefits of different land management practices. It takes into account the value of ecosystem services, such as biodiversity conservation, water regulation, and soil fertility, which are often overlooked in traditional economic models. By quantifying these benefits, the PPC model provides a more holistic view of the impacts of land management decisions.

For example, the model can evaluate the socio-economic benefits of converting cropland to grassland or introducing agroforestry systems. These practices not only enhance biodiversity and improve soil health but also offer long-term economic resilience by reducing dependency on intensive farming practices that are vulnerable to climate change. The model's ability to quantify these benefits makes it a tool for advocating sustainable land management practices that align with broader environmental and social goals.

Applications and Future Potential

The PPC model has been specifically designed to support the implementation of CCM measures in the Baltic States and Finland, but its applicability extends beyond these regions. As the model incorporates country-specific data and scenarios, it can be adapted for use in other areas facing similar environmental challenges. This makes the PPC model a versatile tool for land management and climate policy planning.

The model's insights are particularly relevant for integrating sustainable practices into broader agricultural and rural development strategies. By providing data-driven evidence of the long-term benefits of sustainable land management, the PPC model can support the inclusion of these practices in policies. As climate change continues to impact global agriculture, tools like the PPC model will be helpful in the transition to more resilient and sustainable land use systems.

Conclusion

The PPC model offers a framework for assessing the financial, economic, and socio-economic impacts of various land use scenarios. By integrating these factors, the model not only helps landowners and policymakers make informed decisions but also promotes practices that ensure long-term environmental and economic sustainability. Though it should be considered a complementary instrument providing indicative guidance on the costs and benefits of organic soil management choices under the assumptions and input data used in the algorithms. It is open for further after-project life improvement and is not designed to be the only decision-support tool used (need to be cautiously seen in terms of guidance for decision-making).

LIFE ORGBALT TEAM

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