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Associating Marginal Abatement Cost Curves (MACC) for greenhouse gas emissions from the agriculture of Latvia with carbon sequestration data

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Statement of the Problem: Environmental preservation is one of the EU multifaceted policy priorities that influences all the other policies, among them agricultural (European Commission, 2011). Agriculture plays an essential role in environmental preservation and in shaping climate policies. The agriculture of Latvia is the second largest source of greenhouse gas (GHG) emissions, accounting for 24.2% of the total emissions produced in the country (Latvia's National Inventory Report, 2017). All the sectors of the economy have to contribute to the reduction of GHG emissions.

Methodology & Theoretical Orientation: A popular way how to analyse GHG emission abatement measures is to use a marginal abatement cost curve (MACC) that ranges the measures according to their costs and emission reduction potential. The present research focuses on the MACCs designed for Latvia in relation to agricultural emission reduction measures, which were complemented by two new measures, i.e. "paludi culture crops (reed (for construction)) on arable land with organic soils" and "establishment of permanent crops (highbush blueberry) in organic arable land", that are associated with land use and land use change. Besides, the research analysed 23 measures, revealing their effects on both the agricultural and the LULUCF sectors.

Findings: The overall conclusion was that the interaction of most of the measures was neutral (12 measures). Only three measures made positive effects on both sectors, meaning GHG emission reductions in both sectors. The effects of two measures were unclear, as there was a lack of relevant research investigations. However, a negative interaction was found for six measures, which was mainly due to the fact that an increase in green biomass produced by the agricultural sector would result in additional emissions, while the LULUCF sector would increase CO_2 sequestration because of the increase in green biomass.

Conclusion & Significance: The research found that some of the measures incorporated in the complemented MACCs had potential for CO_2 sequestration and C accumulation along with the potential for GHG emission reduction

Recent Publications

1. Kreismane Dz, Popluga D, Berzina L, Naglis-Liepa K, Lenerts A, Rivza P (2017) Organic farms and agricultural GHG emissions in Latvia / // Organic Eprints: NJF Report. (NJF Seminar 495). Vol. 13 No. 1 : 4th Organic conference proceedings "ORGANICS for tomorrow's food systems" p 139-141pp

2. Naglis-Liepa K, Popluga D, Lenerts A, Rivza P, Kreismane Dz (2018) Integrated impact assessment of agricultural GHG abatement measures. Proceedings of the International scientific conference "Economic science for rural development", Jelgava, May 9-11, 2018 / Latvia University of Life Sciences and Technologies. Faculty of Economics and Social Development. Jelgava, 2018. Nr. 49: Bioeconomy. Finance and Taxes. Home Economics. New Dimensions in the Development of Society, p. 77.-83.
3. Naglis-Liepa K, Popluga D, Rivza P (2015) Typology of Latvian agricultural farms in the context of mitigation of agricultural GHG emissions / // 15th International multidisciplinary scientific GeoConference SGEM2015 "Ecology, economics, education and legislation" : conference proceedings, Albena, Bulgaria, 18-24 June, 2015 / Bulgarian Academy of Sciences. Sofia, 2015. Vol. 2 (5) : Ecology and environmental protection, p. 513-520..
4. Popluga D, Naglis-Liepa K, Lenerts A, Rivza P (2017) Marginal abatement cost curve for assessing mitigation potential of Latvian agricultural greenhouse gas emissions: case study of crop sector /. Energy and clean technologies; Vol.17 Issue 41: Nuclear technologies. Recycling. Air pollution and climate change, p. 511-518.
5. Naglis-Liepa K, Popluga D, Lenerts A, Kreismane Dz, Rivza P (2018) Marginal abatement cost curves in analyzing GHG emissions from agricultural holdings in Latvia: the cluster approach (2018) // 26th NJF congress "Agriculture for the next 100 years" programme and summaries of presentation, Kaunas, Lithuania, 27-29 of June, 2018 / Aleksandras Stulginskis University, Lithuanian Research Centre for Agriculture and Forestry, Lithuanian Academy of Sciences. Kaunas, 2018. p.30.

Biography

Kaspars Naglis-Liepa is assistant professor and researcher at Latvia University of Life Science and Tehnologies Faculty ond Economics and Social Develiopment. Scientific interest: Bioeconomics, bioeconomy, circular economy, GHG, ammonium emission reduction, Member of Research Group for GHG emission abatement studies.

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