Developing Economic â€“ Environmental Hybrid IO-CGE model for the Danish municipalities

Topic: Modelling Carbon Footprints in the MRIO and CGE frameworks
Author: Nino Javakhishvili-Larsen
Co-Authors: Albert Kwame Osei-Owusu

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Author. Dr. Nino Javakhishvili-Larsen, Head of Regional Model, Centre for Regional and Tourism Research, Denmark. njl@crt.dk
Co-authors:
Irena Stefaniak, Centre for Regional and Tourism Research, Denmark. is@crt.dk
Albert Kwame Osei-Owusu, PhD student, Department of Environmental Science - Emission modelling & environmental geography, Aarhus University, Denmark, akoo@envs.au.dk

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There are ongoing political and scientific debates regarding pollution from the economic activities and its consequences on nature and society in the global terms. The climate change seems inevitable and the natural resources keep depleting. One of the reasons can be because we lack understanding how to treat the resources and how to decrease pollution without creating economic disasters, hunger and further conflicts. Another reason can also be the fact that we look the environmental issues mainly globally with the national political checklist of solutions, however, we fail to understand that the pollution and utilisation of the resources are result of the locally bounded economic activities and therefore, solutions for the global environmental issues should be studied and solved locally. The aim of this paper is to develop methodological approaches for integrating environmental data to the local economic data and construct multiregional IO and CGE model bottom-up, for small geographical units, such as municipalities in Denmark. The research is based on the Danish Interregional economic model SAM-K/LINE for Danish municipalities. In this mode, the interregional SAM is built on two-by-two-by-two approach, involving two sets of actors (production units and institutions / households), two types of markets (commodities and factors) and two locations (origin and destination). While LINE is based on the Leontief and Miyazawa formulations of the Interrelational Income Multiplier Model that incorporates SAM data input and the two-by-two-by-two approach.
This paper describes the methodology that we use to hybridize the economic cycle of LINE with the emission cycle at the product (commodity) and the municipality (NUTS3) level.
In this paper we explain how we intend to extend SAM-K/LINE model by creating environmental-economic accounting for production and final demand by commodity and geography. This will allow us to study both producer and consumer actions and test how changes in the production at one side and the consumption on the other side can support the reduction of carbon footprint, by maintaining economic growth. Linking the demand-side approach to supply-side approach and developing the economic-environmental hybrid IO-CGE at the local (municipality) level will contribute to the previous similar attempts, which should create better understanding of how to solve environmental issues at the local level in order to save the planet globally.