Economic Trade-offs and Optimization of Ecosystem Services in Soyang Watershed of South Korea

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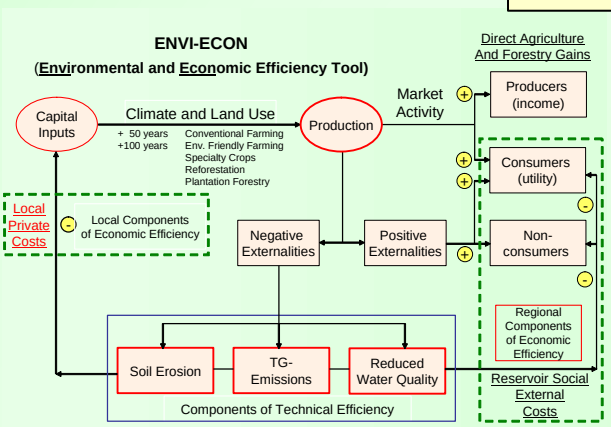
Problem Statement:

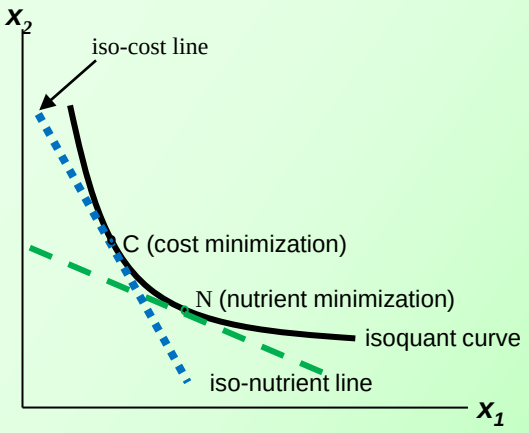
Agricultural and forest production requires resources, is determined by ecological processes, and results in ecosystem services for society. However, the production leads at the same time to both positive and negative externalities. The externalities can be enhanced or mitigated by human behavior, which is mainly driven by economic gains and losses. Therefore, understanding potential economic trade-offs and optimization of ecosystem services in response to global change is a fundamental consideration in order to carry out well-informed decision-making and establishment of environmental policies.



Overall Objectives:

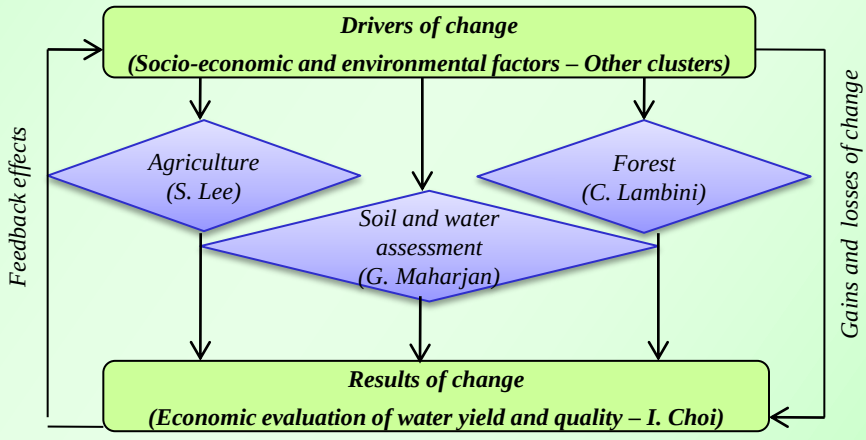
- To quantify in economic terms the trade-offs in ecosystem services with respect to agricultural and forest production versus water yield and quality,
- To optimize the total economic value of ecosystem services,
- To integrate economics with natural science studies to provide new tools for understanding and and sustainably managing ecosystem services,
- To simulate the effects of global change and policy instruments on the economic value of ecosystem services.

An illustration of expected trade-offs



Project Linkages and Research Organization:

Sustainable watershed management



Individual themes are described in detail in the project clusters.

- Agricultural production and consumption are studied to compare the willingness to pay and willingness to accept for ecosystem services and to identify the associated trade-offs.
- Cost minimization and spatial optimization of forest ecosystem services are modelled.
- Soil and water assessment is conducted with SWAT to examine the effects of topography, changes of climate and management practices on individual farms.
- The resultant changes in production, water yield and quality, and erosion will be simulated and analyzed.

Cross-Cutting Issues:

- Connection between process models (SWAT) and economic evaluations
- Simulation of future changes with respect to climate, market, and policy scenarios
- Feedback mechanism from the results to drivers of change