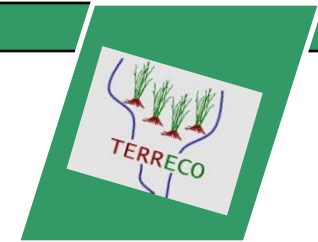


Integrated Development and Resource Management in the Soyang Lake Region
Yanggu, South Korea, June 13-19, 2010



The TERRECO approach to sustainable regional resource management: A Program of Education and Research

John Tenhunen and Bora Lee
University of Bayreuth, Germany



Complex Terrain and Ecological Heterogeneity (TERRECO):

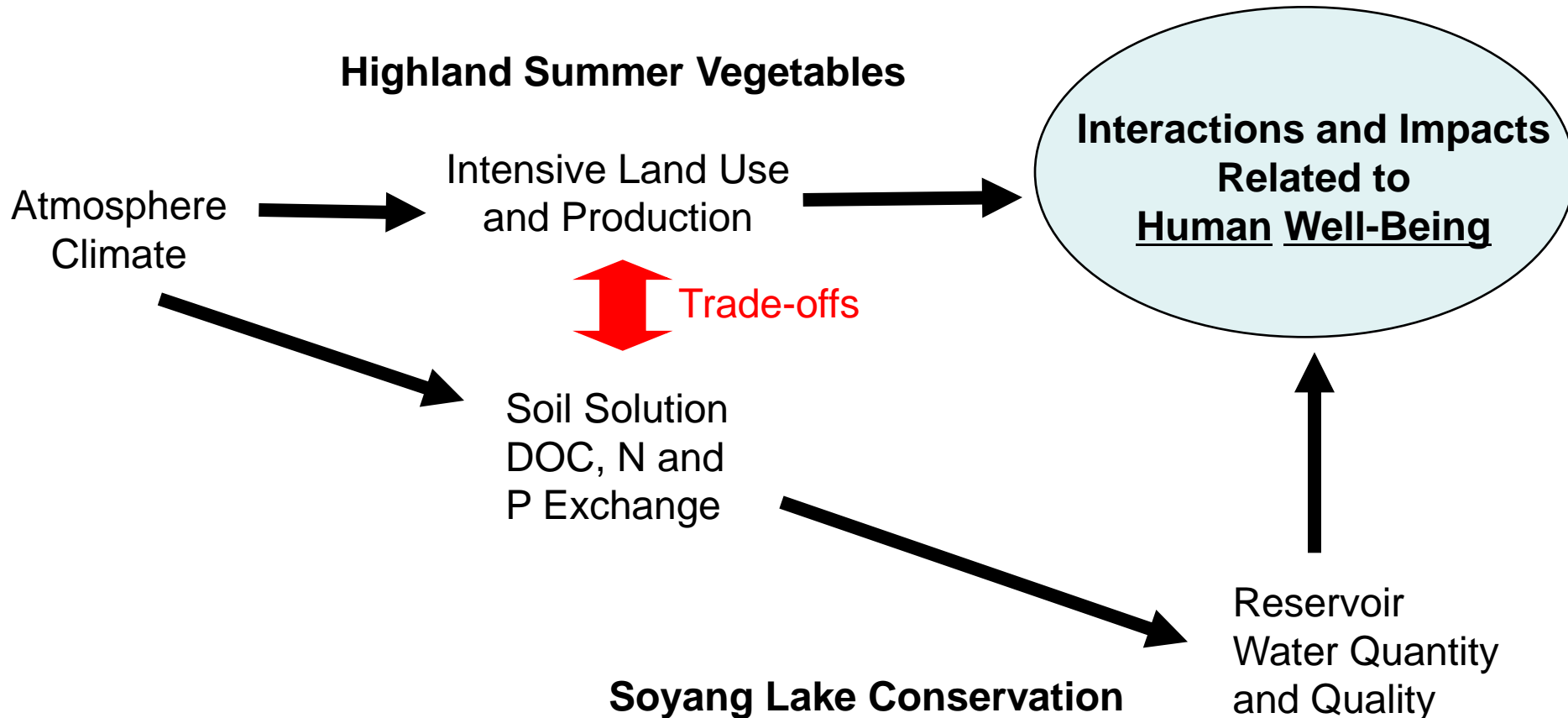


Evaluating ecosystem services in relation to shifts in processes, biotic interactions, and biodiversity in mountainous landscapes





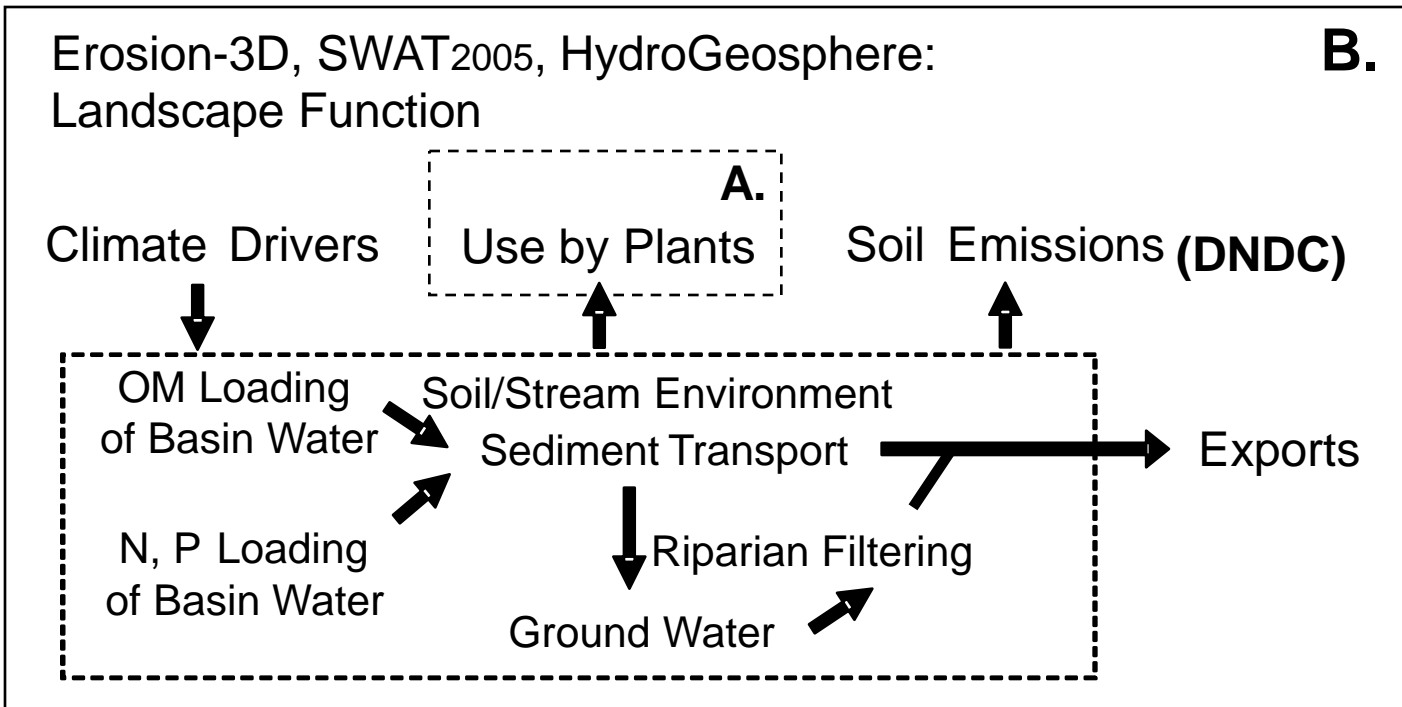
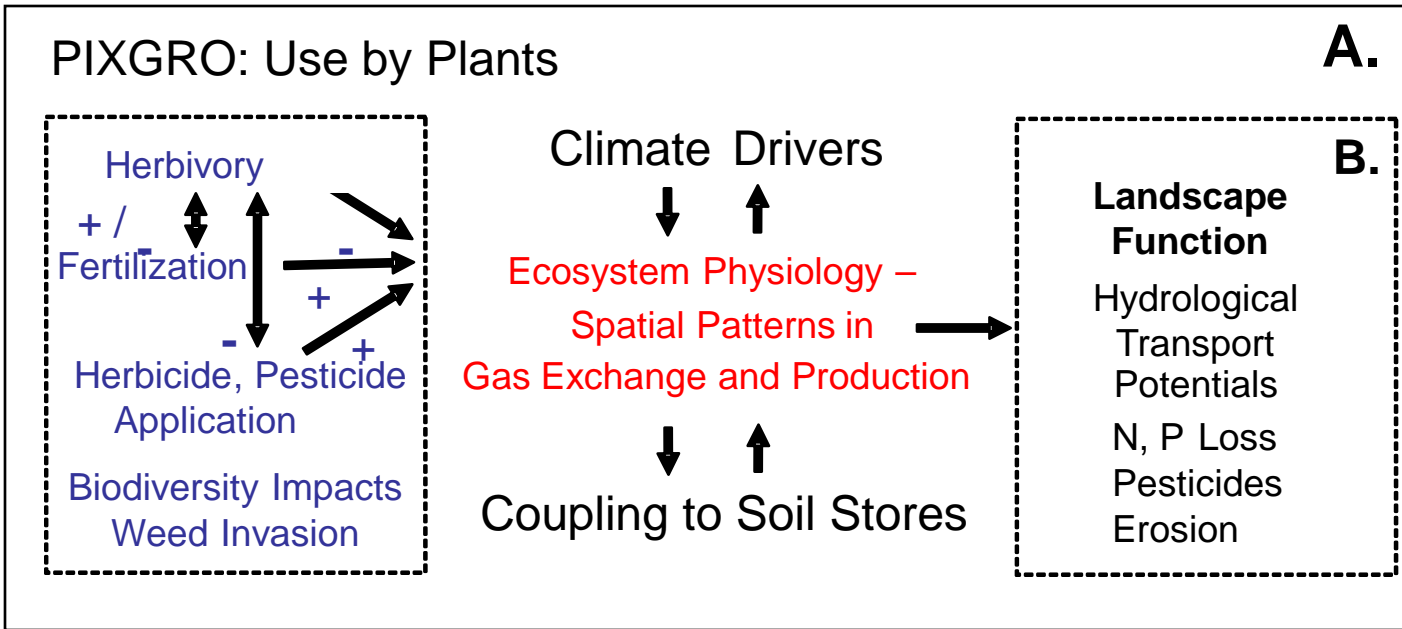
Central Question: Can we understand the trade-offs?





Local Field Studies to Support Modelling

1. Land use from year to year – and local decision making
2. Climate controls on carbon uptake and crop growth
3. Fertilizer inputs and agricultural efficiency
4. Insect pests and new ways of biological control
5. Occurrence and preservation of valued bird populations
6. Understanding water flows in the Haean landscape
7. Water use, hydrology and transport of materials with respect to preservation of Soyang Lake
8. Understanding local stakeholder thinking and interests



Evaluation of Ecosystem Services

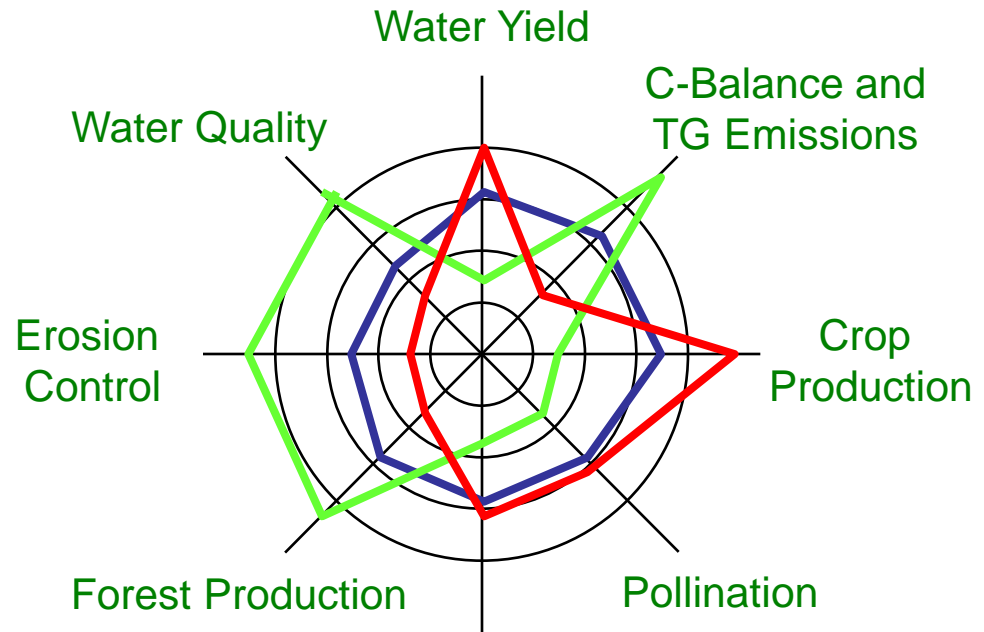
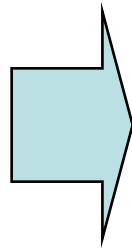
Evaluations via a suite of models:

Statistical Models

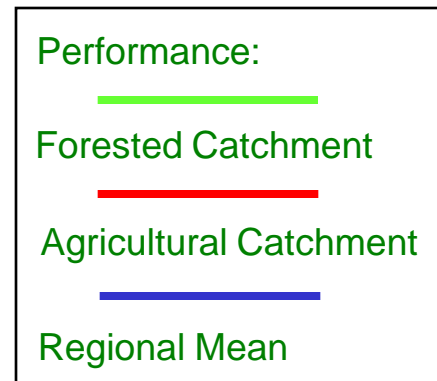
Process-based Models

Phenomenological Models

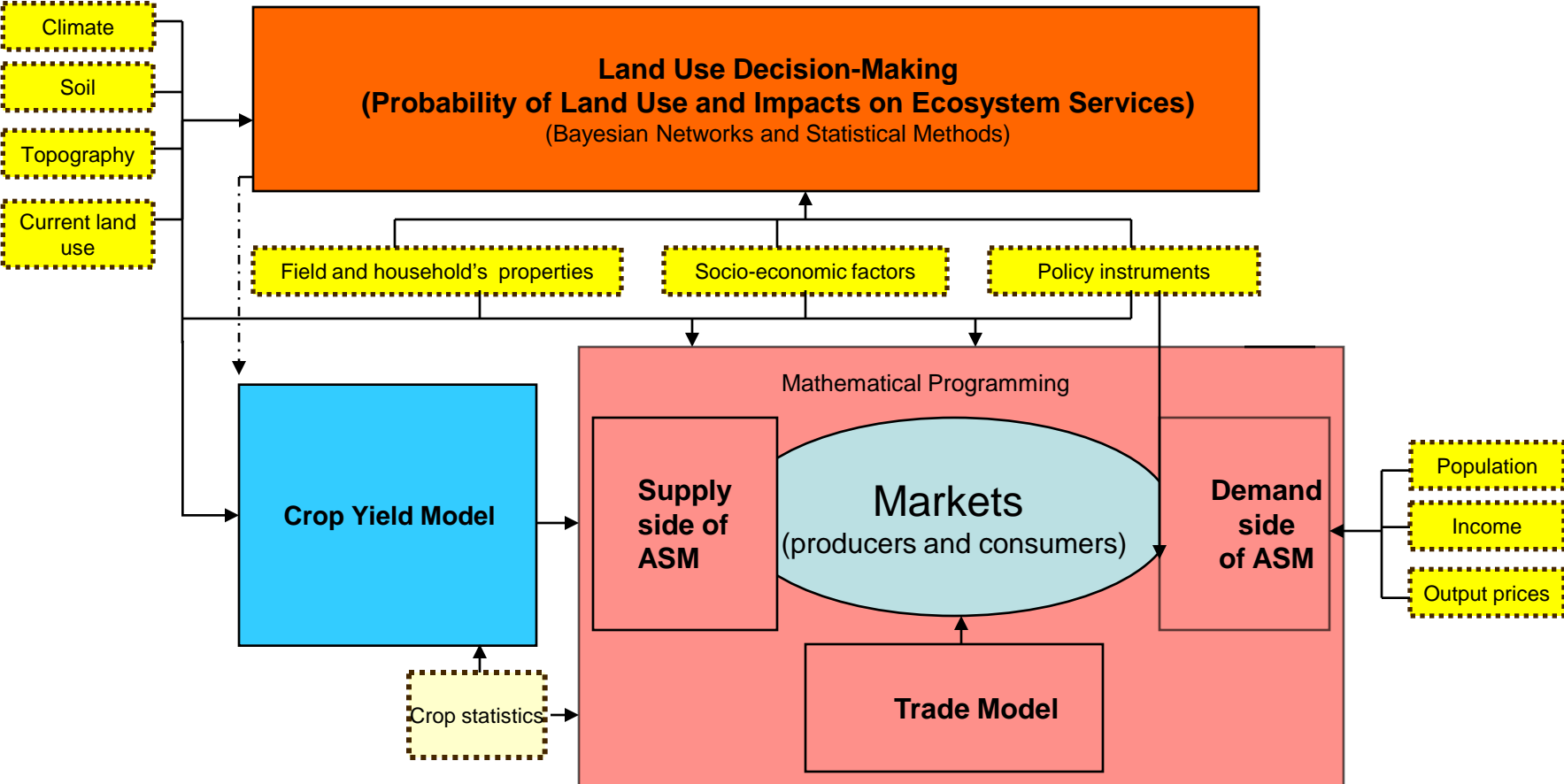
Physically-Based Models

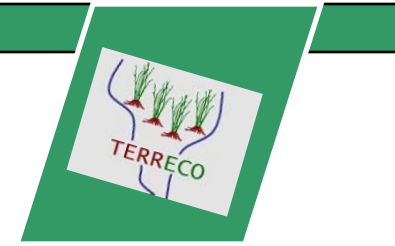


Trade-offs in Production vs. Water Yield and Water Quality



Production/Hydrological/Economic Framework:





Cooperation with KNU, RIG, and other agencies

Complex Terrain and Ecological Heterogeneity (TERRECO)

Landscape Processes

Atmospheric coupling
Plant production
Biogeochemistry
Hydrology and transport

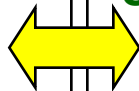


**ANALYSIS AND
MODELING**



Social Framework

Demography
Regulatory policy
Economic analysis
Land management
Land use decisions



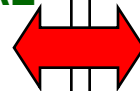
CLIMATE CHANGE



**SOCIAL-ECOLOGICAL
SCENARIO
EVALUATIONS**



SOCIAL RESPONSE



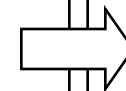
**DESIRED
ECOSYSTEM
SERVICES**



**AGENCY
DISCOURSE**
Land use decisions

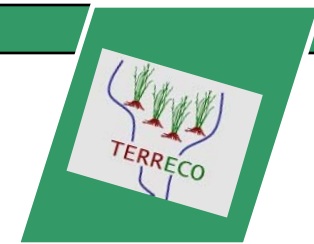


**SUSTAINABLE
ECOSYSTEM
SERVICES**



**SCALING with
respect to
GLOBAL
CHANGE
ISSUES**

**POLICY
ACROSS
SCALES**



International Memorandum of Understanding

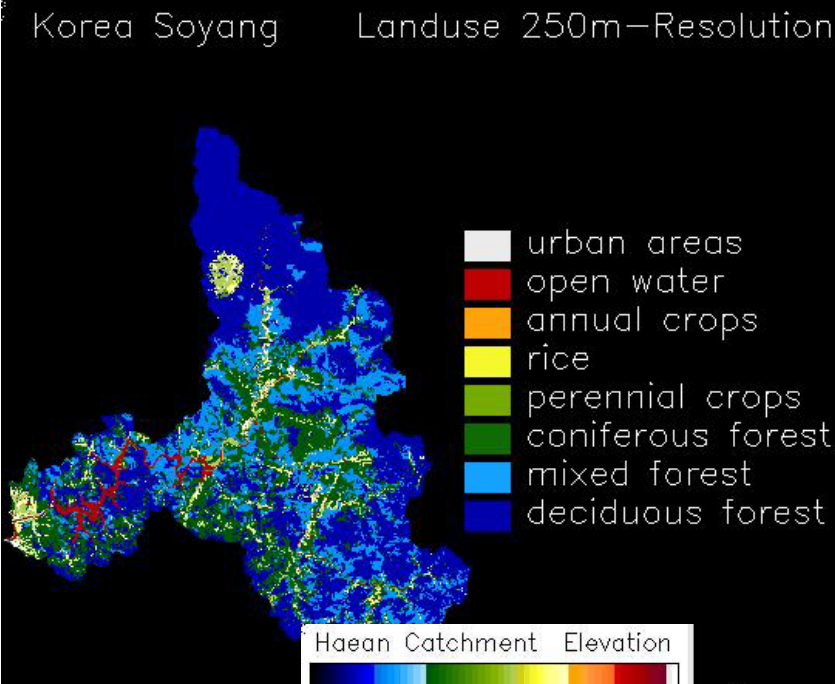
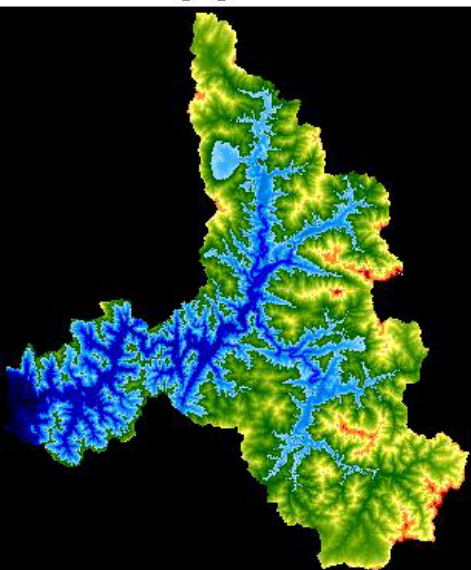
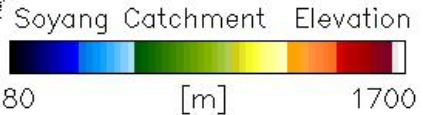
University of Bayreuth (UBT) and Research Institute of Gangwon (RIG)

Execution of the joint program may include:

1. Cooperation on student research projects,
2. Exchanges of institutional professionals to accomplish joint research goals,
3. Collaborative research projects, workshops or conferences.

Current themes for joint research investigations:

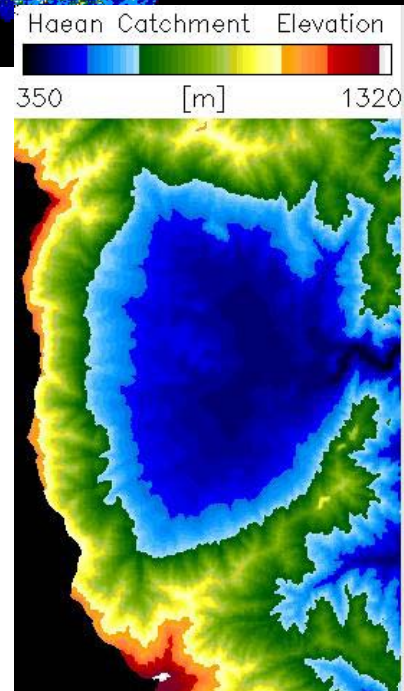
- a. Economic Evaluation and Conservation of Soyang Lake Watershed under Global Change
- b. Optimal Management Plan for Highland Agricultural Areas



2800 km²
250 m
resolution

Soyang Lake Watershed – integrated unit for water resource management . . . as well as for evaluations of economics and policy consequences

60 km²
30 m
resolution

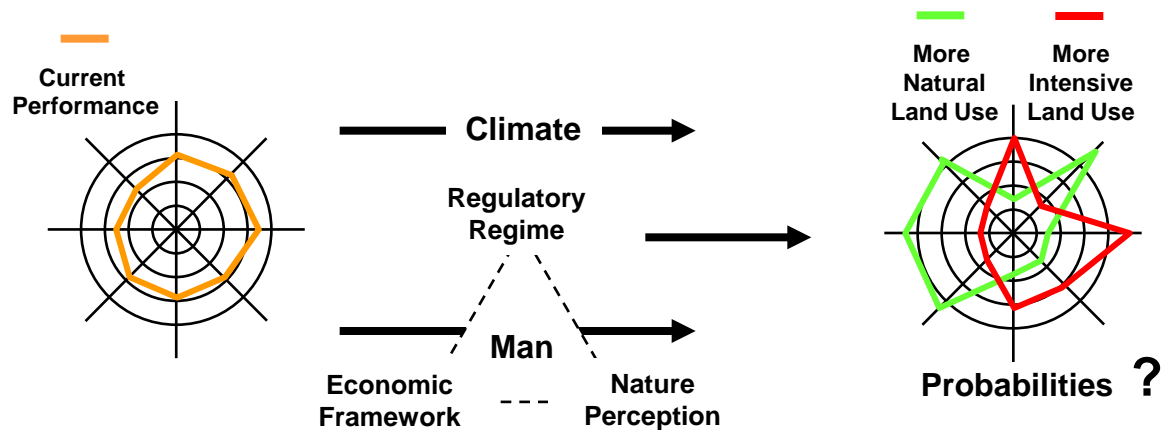


Scales of Study

Haeon Catchment - for field studies and model testing



A Focus on Scenario Evaluations



With Future Climate and Future Land Use

Together with RIG and other planners – February 2011 at KNU.



TERRECO – What more is it? – An important resource for all!

- „International Research Training Group“
- Cooperation between DFG and KOSEF
- **International education and exchange**
- Phase 1: financed from March 2009 until August 2013
- Phase 2: possible until Februar 2018
- Participants: ca. 20 scientists in Bayreuth and
ca. 20 scientists in Korea plus doctoral students
- **A potential to influence 70 to 80 young scientists
capable in resource management under global change**

**Integrated Development and Resource Management in the Soyang Lake Region
Yanggu, South Korea, June 13-19, 2010**



Thank You Very Much!