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Geography of Food
Geoinformatics

CONSUS
Connecting for Sustainable Sourcing

Food production in smallholder farming systems
Developing a spatially explicit decision-model for trade opportunities

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Context

Growing pressure on land and other resources is threatening the security of supplies for agribusinesses and jeopardizes the sustainability of agricultural production. A bio-economic tool, named CONSUS, is currently being developed. The tool shall assists both agribusinesses and producers by evaluating sustainability, suitability and profitability of specific production opportunities and assessing the overall feasibility of such projects.
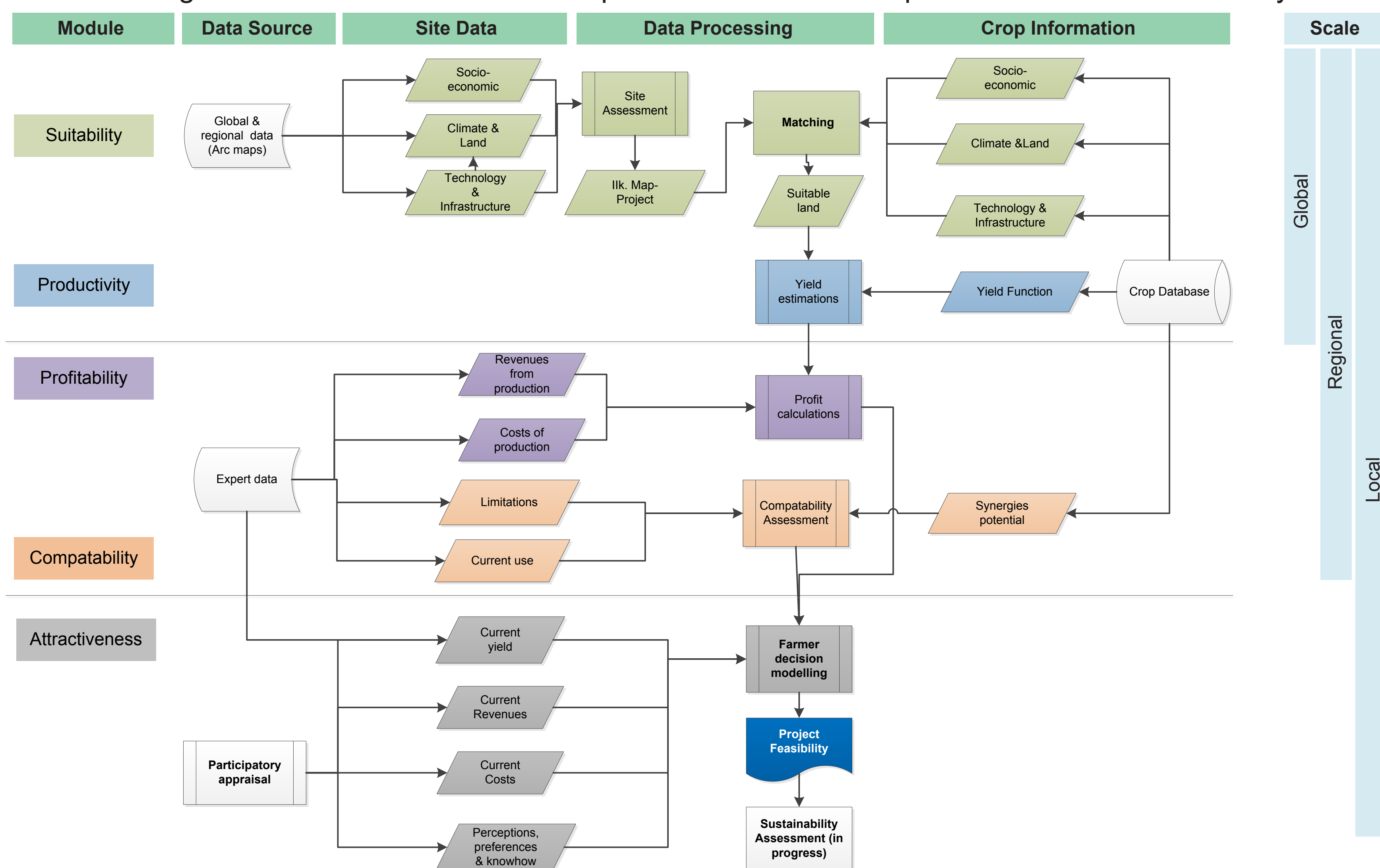
Approach

CONSUS is designed as model, which supports users in the process of feasibility analysis for new sourcing and production opportunities. The model will be realized in a geographic information system (GIS). Different GIS methods such as a multi-criteria analysis will be used for integrating spatial and non-spatial data. Current land use and agricultural systems are hereby considered as well as socio-economic conditions and site characteristics.

Results are spatially explicit and show suitable areas for a given crop, their productivity, profitability, and compatibility. In a further step CONSUS will point out barriers of production and sustainability impacts.

Model structure

CONSUS is designed as a multi-modular and sequential model. This allows its application in a variety of contexts and a range of scales. Use of modules depends on the relevant questions and data availability.

Case Rwanda

The government of Rwanda thrives to increase soybean production in order to feed the first installed soy factory in the country. Using CONSUS best suited areas and highest production potential shall be identified. Suitabilities have been assessed for both soya (a) and maize (current major crop, difference b), using the maximum limitation method [4]. Initial results show potential for soya mainly in eastern Rwanda.
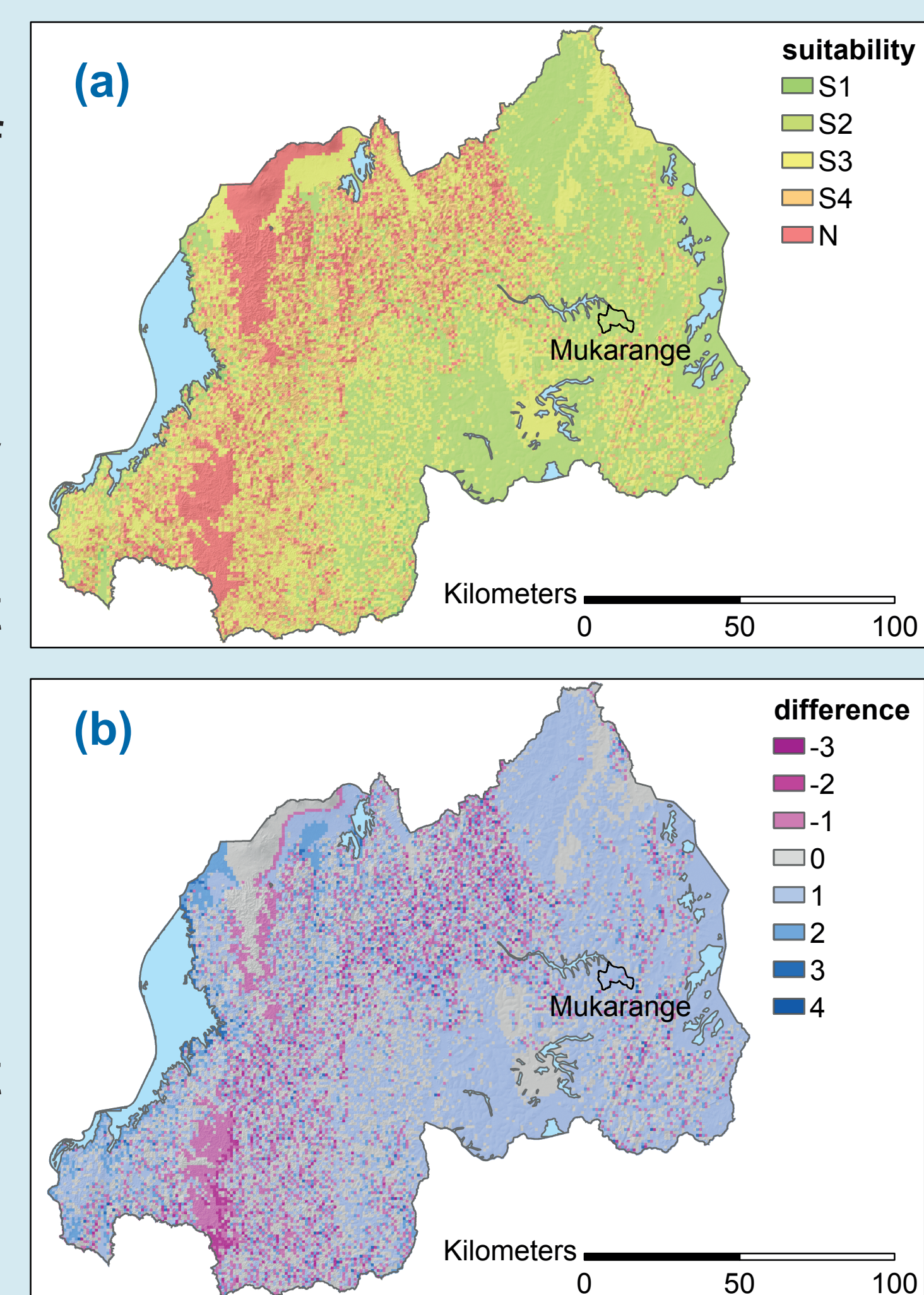
(a) Suitability for soya cultivation (S1-S4 suitable, N not suitable)
(b) Relative suitability soya vs. maize (positive numbers indicate higher suitability for soya)

Module	Goal	Method	Data Source
Suitability	Identification of areas suitable for target crop production	Land evaluation [1, 3, 4]	Global and regional maps (e.g. climate, soil, topography); Crop data [5]
Productivity	Yield projections depending on site conditions	Different approaches: Agro-Ecological Zoning [2; 6]	Site & crop data
Profitability	Weighing of costs and benefits of production depending on site conditions	Cost benefit calculation	Regional statistics / Experts
Compatibility	Identification of areas where production is compatible with local system	In progress	Regional statistics / Experts
Attractiveness	Projection of farmers decision considering perceptions, preferences and know-how	In progress	Experts/ Participatory data

Outlook

Two more cases are currently planned applying and testing CONSUS in a different context:

a) Global site assessment for hazelnut-production

b) Diversification Strategies for coffee farmers in Guatemala

The goal is to develop a tool which can be easily applied for several cases from the industry. The major challenge lies in overcoming the trade-off between model usability and reliability.

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