Searching for synergies in crop rotation management – A simulation-optimization approach using SWAT

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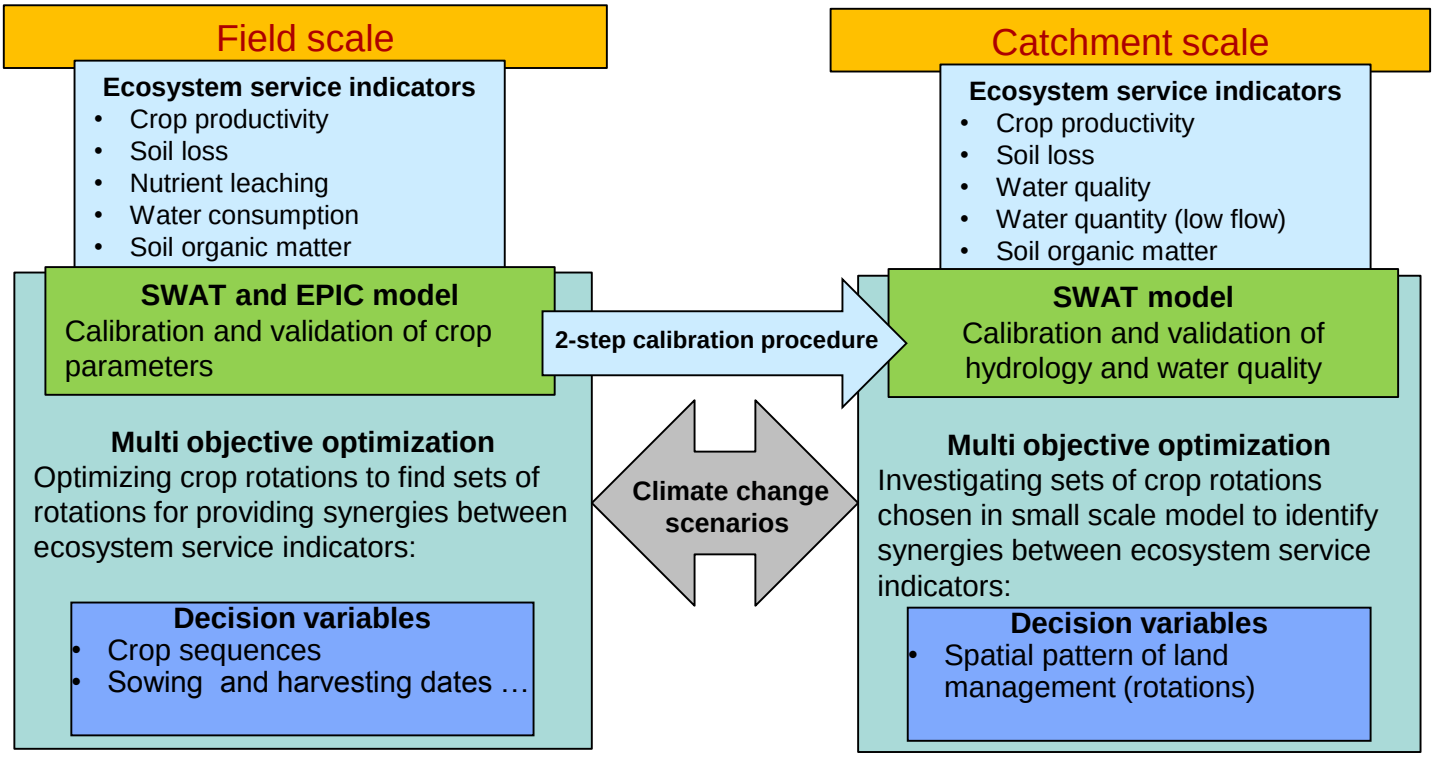
1- Background

Climate change is expected to have severe impacts on agricultural production systems. In previous studies investigating possibilities for adaptation to climate change, changes in crop rotation management have shown large potential for adaptation and also for providing synergies between multiple ecosystem services in a case study in Western Switzerland. However, the possibilities for adapting rotational management have not been studied in detail yet.

2- Main objective

- Investigating the ability of different crop rotations with and without cover crops for providing synergies between different ecosystem services, and identifying a set of crop rotations providing optimum synergies at field scale
- Investigating the effects of spatial configurations of selected crop rotations on the provision of multiple ecosystem services at catchment scale, and identifying spatial patterns of land management providing optimum synergies at catchment scale.
- Investigating impacts of climatic changes on synergies and trade-offs between ecosystem services at field and catchment scale

3- Material and method



4- Expected results

- Robust recommendations for adaptation planning at multiple scales:
  - At field scale, results are optimized sets of rotations providing synergies between ecosystem services under different climatic conditions.
  - At catchment scale, results are optimum spatial patterns of land management providing synergies between ecosystem services under different climatic conditions.
- Calibrated and validated crop parameters for SWAT in Switzerland.

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