
Regional specific farming systems and ecosystem services tradeoffs: a Tunisian case study

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Abstract

Agro-ecosystems around the Mediterranean region have co-evolved over millennia, shaping the current landscapes and providing many more ecosystem services to people than food. Different pressures result in changes of land management and land cover over time, ecosystem services' supply has therefore been declining across a suite of services. In this research, we studied the ecosystem services' supply in the current situation in Tunisia with an alternative more sustainable scenario using soil conservation practices.

To capture the agricultural diversity and complexity across Tunisia, a region specific farming system typology was developed. The identification and spatial definition of Mediterranean farming systems was developed by experts during a workshop. This information combined with land cover data was used as input into an agroecosystem model (LPJmL) to quantify ecosystem services' supply such as crop production (from 23 different types of crops), fodder production and carbon sequestration (from soil and plants differently). We computed the supply of these indicators under two different scenarios, namely business as usual (which includes a mixture of the currently existing traditional, conventional and intensive farming systems) and an alternative scenario in which soil conservation practices are applied.

The results of the different scenarios show regionally specific trade-offs and synergies, both in terms of their amplitude as well as the services involved. These results suggest that the impact of changes in management and their subsequent improvement of ecosystem services supply is context specific. This should be taken into account when striving for either conservation of traditional practices or implementing new practices.

Keywords: Mapping, agriculture, ecosystem service, management

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