
Developing an integrative multi-scale approach of regional agriculture to support the assessment of pest regulation service delivered by farmland biodiversity

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Abstract

Landscape ecology increasingly addresses ecosystem services (ESs) of farmland biodiversity with the view to sustain the transition of agriculture towards agroecology. This raises methodological challenges. Several studies consider the regulation ESs that farmland biodiversity can provide for reducing the use of chemicals in crop production, according to cropping system and parcel condition. But developing new options for the management of cropping systems requests complementary studies. There are variations in the intensity and the regularity of ESs provision over places and years, which depend upon many ecological and social processes at a variety of spatial scales, from the parcel to the entire landscape, and temporal scales, from the year to several decades. On another hand, studies of farm trajectories showed that farmers' attitude with regard to new management practices vary according to the farm social-ecological specificities and history. We developed an overarching approach of these interrelated issues to support the work of SEBIOAG-Phyto project, where

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ESs provided by farmland biodiversity for pest control in cropping systems are under study in a 100-parcel network over 5 contrasted regions in France. We adopted a framework view of the interactions between landscape and land management processes as part of a multilevel social-ecological system. We developed from there a cooperation with an economy research group in comparative agriculture to apply the agrarian system assessment method this group developed to the multilevel assessment of changes of topical importance for the project in the 5 study regions. We give an overview and discuss the results gained.

Keywords: Ecosystem services