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## Quantifying landscape aesthetics across spatial scales

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## ABSTRACT

Since the 1950s, intensification and scale enlargement in the agricultural sector have changed the structure and composition of agricultural landscapes across Europe. Initially, the intensification and scale enlargement of farming was mainly driven by the large scale application of synthetic fertilizers, mechanization and the production support subsidies of the European Common Agricultural Policy (CAP). Since the 1990s, the globalization of commodity markets and CAP reforms were an incentive for increased cost-efficiency of farmers, which resulted in further intensification and scale enlargement, and land abandonment in less favored areas. The landscape changes that were witnessed in Europe during the past six decades, have affected the flows and values of ecosystem services that are provided by agricultural landscapes today. In order to come up with an integrative analytical framework for a landscape scale ecosystem services assessment, we have reviewed literature that focuses on relations between agricultural policies and management, landscape structure and composition and the contribution of ecosystem services to regional competitiveness. The application of the ecosystem services concept in agricultural landscapes has specific challenges. In contrast to natural ecosystems, ecosystem service flows and values in agricultural landscapes are often a result of interactions between agricultural management and ecological structures. We have addressed these interactions and describe how land management by farmers and other land managers relates to landscape structure and composition, while also examining the influence of commodity markets and policies on the behavior of land managers. Additionally, we addressed the influence of consumer demand on flows and values of the ecosystem services that originate from the agricultural landscape. The analytical framework provides guidance to landscape scale ecosystem services assessments. At the same time, the review of current research and methods available to make assessments indicated several gaps in knowledge and methodology. In particular for the assessment of the relations between landscape structure and composition and the supply of non-provisioning services novel methods are required.