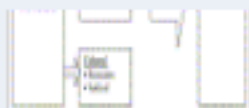


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2. Ecosystem services and dis-services to agriculture

2.1. Ecosystem services to agriculture

2.2. Ecosystem dis-services to agriculture

3. Implications of ES for agricultural management

[Table 1](#)

4. Major issues and research needs

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Abstract

Agricultural ecosystems are actively managed by humans to optimize the provision of food, fiber, and fuel. These ecosystem services from agriculture, classified as provisioning services by the recent Millennium Ecosystem Assessment, depend in turn upon a web of supporting and regulating services as inputs to production (*e.g.*, soil fertility and pollination). Agriculture also receives ecosystem dis-services that reduce productivity or increase production costs (*e.g.*, herbivory and competition for water and nutrients by undesired species). The flows of these services and dis-services directly depend on how agricultural ecosystems are managed and upon the diversity, composition, and functioning of remaining natural ecosystems in the landscape. Managing agricultural landscapes to provide sufficient supporting and regulating ecosystem services and fewer dis-services will require research that is policy-relevant, multidisciplinary and collaborative. This paper focuses on how ecosystem services contribute to agricultural productivity and how ecosystem dis-services detract from it. We first describe the major services and dis-services as well as their key mediators. We then explore the importance of scale and economic externalities for the management of ecosystem service provision to agriculture. Finally, we discuss outstanding issues in regard to improving the management of ecosystem services and dis-services to agriculture.

Keywords

Ecosystem services; Agriculture; Pollination; Soil fertility; Ecology; Hydrology; Environmental economics; Environmental policy