What are the negative external effects of biodiversity and ecosystem service decline linked to agricultural practices? A review of current evidence

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Résumé

We are currently living an unprecedented era of biodiversity loss worldwide (Ceballos and Ehrlich, 2023). The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has consistently alerted the policy arena about the principal pressures causing biodiversity and ecosystem services loss: from land-use change to direct exploitation of natural resources, climate change, pollutions, and invasive species. Various anthropogenic activities combined with the globalisation of trade, the human demography, the intensive use of technology or governance power asymmetries, exacerbate these pressures on biodiversity. Agriculture is no different; ample evidence suggests the multiple negative effects of species decline on ecosystem functioning and services. Indeed, the continued decline of biological diversity, which jeopardises the resilience of terrestrial habitats to anthropogenic disturbances, is a major concern for current and future ecological, social, and economic stability. Indeed, if the loss of ecosystem services is not slowed, it may be very challenging to meeting future societal needs (Biggs et al, 2012). Although the scientific literature has studied the effects of agriculture on biodiversity and ecosystem services independently, a lack of systematic reviews exists collating studies which explicitly link the risks of negative externalities to loss of biodiversity on human societies caused by various farming practices. We review the existing literature to elucidate this 3-way connection between i) agricultural management practices, ii) their impact on biodiversity loss, and iii) the consequences for human societies in terms of economic, social, health and environmental indicators.Today, the vast scientific knowledge available makes for an arduous task for policymakers to holistically understand the links between farming practices, impacts on biodiversity, and consequences for human societies. Indeed, current public policies do not have a cross- and multi-disciplinary approach, and tend to favour economic arguments in their decision-making, i.e., yield, cost-benefit analysis, life-cycle analysis. Highlighting the links between agricultural management practices and negative externalities other than economic ones would improve the overall picture of the

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impact of anthropogenic activities both on their environment and on humanity itself, e.g., the social costs of water pollution due to pesticide use, the loss of well-being of people living near intensive croplands, etc. This would be a helpful decision-making tool for public policy.

Mots-Clés: Negative externalities, Farming practices, Biodiversity decline, Ecosystem service decline, Systematic review, Meta, analysis