
Agricultural intensification: definition and controversies as regards biodiversity and food security

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Abstract

Intensive agriculture is frequently criticized today because it is considered as a major source of environmental damage and biodiversity losses. However, it is necessary to analyze **in which factor(s) agriculture is intensive**. Indeed, a factor of production is intensively managed if significant amounts of other factors are combined with it to increase its productivity. Where land was rare – and this has been very frequent at the farmer level, and should become increasingly common – land use intensification is sought, i.e. an increase in production per ha.

However, a broader and systemic approach of production is necessary. There are **other forms of intensification** than chemical inputs and farm machinery: agriculture can be intensive in labor, in different types of knowledge, in ecological functionalities... These different forms have different impacts. In addition, factors can be complementary or substitutable, at least in part. E.g. higher knowledge can make possible input savings (better efficiency) or better use of natural resources (agroecology).

This has led to the concept of **sustainable intensification**, which is sometimes criticized because better input efficiency, or certain substitutions between factors, can be insufficient for biodiversity preservation. Another kind of intensification, **ecological intensification**, also needs to be examined. It corresponds to a better use of ecosystem functioning and of ecological processes, but also of information and of different types of knowledge. **Ecologically Intensive Agriculture** is a way of farming with high ecological intensity, aiming to use natural processes and ecosystem services in a sustainable way.

However, it is not of course sufficient that agriculture better takes into account biodiversity and the natural resources. Greater eco-friendly and biodiversity-friendly agri-food systems don't necessarily ensure real food security, since the other aspects of the latter can be missing: availability, accessibility, acceptability, appropriateness, awareness. In addition, agriculture is not the only cause of biodiversity losses: the increasing population is occupying an increasing area and has an increasing footprint.

Thus the notions of "agricultural intensification" or "intensive agriculture" deserve better examination than an outright rejection!

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