

Aspects of Interdisciplinary Research on Nature Quality in Organic Farming Systems

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Abstract

The conflict between conservation of the rare and high quality nature and management of the common widespread nature is discussed based on the concept of Natural Capital Index. Nature Quality on farms should include considerations for both types of nature challenging the methodological research approaches behind.

Background

Organic farming is often considered an environmentally friendly alternative to traditional farming based on numerous results of a more varied biota in the organically grown fields. However, the expectation that organic farming favours land use and farm practises that supports ecosystem functioning and to a higher extent contribute to nature qualities (Stoltze et al. 2000) are thus generally not well documented. The EU regulations in Natura 2000 and Agenda 2000 provide a policy framework for planning at national and regional levels. The aim, however, of the two instruments is very different. Natura 2000 focus on the rare and threatened species and habitats, whereas the AES in Agenda 2000 provides tools for integration of nature considerations for the less threatened, common species and habitats in e.g. the agricultural landscapes.

Three major strategic issues need to be balanced in the considerations on nature qualities of the farmed landscape: Production interests, biological conservation interests and esthetical/recreational attributes of the landscape (Tybirk *et al.* 2004.). This calls for integrative research on agricultural systems, where environmental and other societal aspects are considered together with the production aspects in order to support a development encompassing the future demands on agriculture.

Objectives

The objective of this work is to identify and discuss the effects of conflicting and interacting approaches in interdisciplinary farming on nature quality. The research approach consider the use of the Dutch Natural Capital Index in order to combine the results from horizontal and vertical analysis on biotope, farm and landscape level.

Methodology

The fundamental difference in quantity and quality of the common and the rare nature in the agricultural landscape are exemplified by the Dutch concept of Natural Capital Index (van Hinsberg et al. 2002). The underlying principle is that changes of biodiversity can be measured as the product between the two components: i) *changes in number and size of habitats*, or “ecosystem quantity”, and ii) *changes of ecosystem quality*. Ecosystem quality is measured relative to a baseline or reference situation, i.e. a

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relatively low-impacted ecosystem. The Natural Capital is defined as the product between ecosystem quality and ecosystem quantity.

The Danish Research Council for Organic Farming (DARCOF) has founded the research project ‘*Nature Quality in Organic Farming – Localisation, farm practice, biological conservation, ecosystem functioning and landscape aesthetics*’ started in 2001 (http://www.dmu.dk/1_Viden/2_Miljøtilstand/3_natur/nk-oj/default.asp). The project consist of a ‘horizontal’ analysis of distribution patterns of organic farms in Denmark and a ‘vertical’ analysis of specific interactions between farming practices and nature quality on both cultivated and uncultivated areas.

Results and discussion

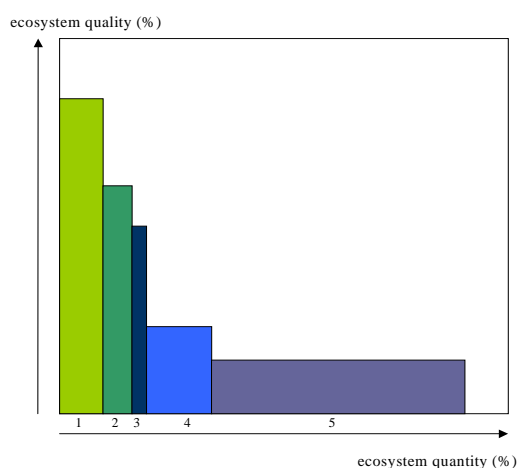


Figure 1. The principle of the Natural Capital Index (adapted from van Hinsberg et al 2002). Ecosystem quality and quantity exemplified for an intensive agricultural landscape. The different parts of the diagram could be: 1: permanent semi-natural grasslands, 2: permanent set-aside, 3: hedges and road verges, 4: extensive cropping areas (organic farming and other low-input farming systems), 5: traditional intensive agricultural land

Results of research from both approaches are now appearing and the great challenge is to combine such partial results through cross-cuttings. An example is that agricultural data on permanent grasslands registered on farms through a livelihood analysis (Frederiksen & Langer 2004) do not fulfil the data needs on grazing and nutrient applications through time to interpret detailed biological data on vegetation and associated arthropods.

The basic assumption of the work is, however, that specific knowledge on nature quality is not very relevant without the coupling to the production data and vice versa. This is a way to combine the two axes of NCI (Figure 1): The farmers understanding of the values of (biological) nature quality on his farm and the tools (e.g. Agri-Environmental Schemes) to take action to incorporate considerations for these values in his farming system. In this way, AES can help to improve the ‘quality of the common’ and NATURA 2000 can be focused on conserving and improving the ‘quality of the rare’ on a specific farm.

References

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