

The Use of Indicators to Assess the Sustainability of Farms Converting to Organic Production

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ABSTRACT

A key feature of farm sustainability is the need to protect and make optimum use of limited natural resources within an economically efficient and socially acceptable agricultural system. Organic farming is often presented as a sustainable solution for agriculture. It is a challenge to measure sustainability in a practical way. This paper is based on a project which aimed to discover and test a suitable method for assessing changes in sustainability at the farm level. It studied the changes in sustainability on three conventional farms that had converted to organic production systems in the UK. A set of indicators for evaluating farm sustainability was devised, based on the French 'Method IDEA' (Indicators of Sustainability in Agriculture), which works with the three dimensions of sustainability: environmental, social and economic. The main conclusions from this project were that conversion to organic production increased the social sustainability of the all the farms studied. The environmental dimension has tended to either increase, or stay at a high level. In contrast to this, the economic dimension has decreased or increased slightly from a low level. The technique has proved a useful way of obtaining a broad ranging snapshot of a farm's sustainability. The project was limited by the small sample of three farms, and applying the technique to a larger sample of farms would certainly strengthen the validity of the conclusions.

INTRODUCTION

Sustainability in relation to agriculture is becoming increasingly important as the linkages between the economy, society and the environment are more widely recognized (Van der Werf and Petit, 2002). Sustainability is a term with diverse interpretation; however, it is commonly applied to ecological or environmental, social and economic aspects of farming systems. Sustainable agriculture is essentially concerned with the ability of agro-ecosystems to remain productive in the longer term.

In order to judge whether an agriculture system or farm is sustainable or not, an easy to use tool or method is required that can provide information understandable to practitioners such as farmers and to other stakeholders such as policy makers. The aims of this MSc project were to discover and to test a suitable method of assessing changes in sustainability. The method was applied to a group of farms that had recently converted to organic production in the UK during 1996-2001, in order to look for changes in sustainability that had occurred due to conversion.

MATERIALS AND METHODS

After examining a number of techniques used to measure sustainability, it was decided to adapt and test the Method IDEA (Indicators of Sustainability of Agriculture) (Vilain,

2000). This is a quantitative evaluation system devised for assessing sustainability at the farm level in France. In the system, the three main dimensions of sustainability are; agro-ecological, socio-territorial and economic. Each of these is subdivided into three or four main components (Table 1) and these are further sub divided into indicators, which are based on measurable data or values. During this project 37 different measures were made to score each farm on a wide range of farming practices, land organization, product quality, social interactions on and off the farm, economic performance and efficiency.

Table 1. Sustainability dimensions and components

Dimensions	Components
Agro-ecological	Diversity Land organization Agricultural practice
Socio-territorial	Quality of the products and territory Employment and services Ethic and human development
Economic	Viability Independence Ownership Efficiency

Three different farms were chosen from a DEFRA-funded ‘Conversion to organic vegetable production’ project. This project has studied the agronomic and economic performance of a group of ten farms, which have converted to organic production. The farms chosen represent different farm types from the group; mixed, arable and intensive vegetable farms. For each of the three farms, data were assembled for the year prior to conversion, and then again 3 to 5 years later, to determine the value of the indicators for each of these years. The data were obtained from farm records and accounts, and were supplemented by a questionnaire and interview with each farmer and by observations undertaken when visiting the farm. This enabled a snapshot of the sustainability of the farming system, pre- and post-conversion to organic production.

Table 2. Descriptions of the farms

	FARM I	FARM II	FARM III
Location	Warwickshire	Lincolnshire	Bedfordshire
Type of business	Family	Company	Family
Farm size (ha)	36	1956	24
Farm type	Mixed	General cropping	Horticulture
Type of conversion	Single step (1999)	Phased over 7 yr	Phased over 6 yr
Data based from	1996-2001	1996-2000	1998-2001

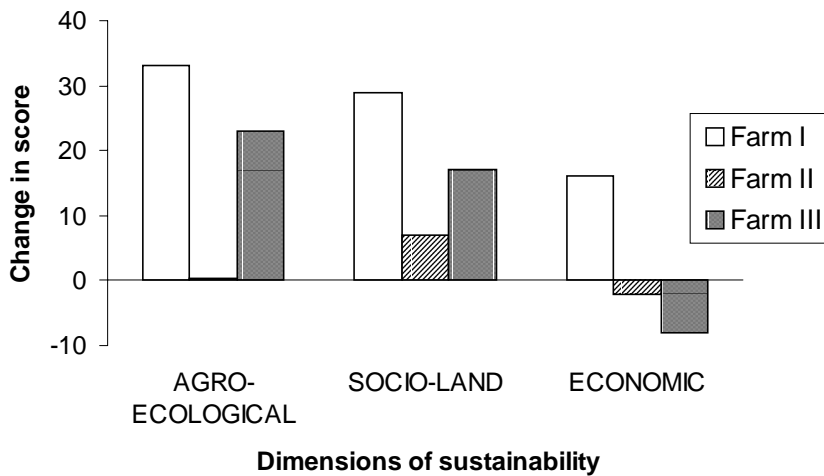
RESULTS

Through the process of conversion to organic production and adopting less intensive agricultural systems, two of the farms (Figure 1) improved their environmental sustainability. This was achieved through stopping the use of artificial fertilizers and pesticides and by growing a wider diversity of crops; all of this was necessitated by the adoption of practices to comply with organic standards (UKROFS, 2001). One of the farms (farm 2), was already using less-intensive farming methods, prior to its conversion, and contained a lot land in set-aside and environmental schemes. This farm was also converting more slowly than the others; therefore its environmental changes were less marked.

All of the farms increased the social dimension of their sustainability through the conversion process. This was related to adopting new marketing practices such as direct marketing, with benefits to the local economy and interactions with the consumers. It was also due to them employing more labour and contributing more employment to the local economy.

Only one of the farms had increased its economic sustainability. This was the small mixed farm where the premiums to be obtained from sale of organic products enabled this farm to become more economically viable. All of the farms incurred costs of converting to organic production, through reduced financial output during the conversion period as they incurred lower yields and were unable to sell their products as organic. This is reflected in their reduced economic sustainability. Output levels rose again when the farms started to sell organic products. However, after only 3-5 years, it may be too early to assess the full economic changes.

Figure 1. Changes in the dimensions of sustainability



CONCLUSIONS AND DISCUSSION

The main conclusions from this project are that conversion to organic production has increased the social sustainability of the all the farms studied. The environmental dimension has tended to either increase or stay at a high level. In contrast to this, the economic dimension has decreased or increased only slightly from a low level. It is thought that the costs of restructuring the businesses and their decline in income during the conversion period have contributed to this decrease. Greater environmental and social sustainability has been achieved by growing a greater diversity of crops, stopping the use of artificial inputs, marketing more produce locally and employing more labour. It is often the case that these benefits to the environment and society do not necessarily have great rewards to the farmer in terms of higher on-farm economic returns.

The method has provided a useful illustration of changes in sustainability by considering a wide range of factors. This assessment has been achieved in a relatively short period of approximately two weeks per farm. It was necessary to make a number of changes to the French system of evaluation to adapt it to UK conditions. The project was limited by the small sample of three farms, and applying the technique to a larger sample of farms would certainly strengthen the conclusions. This project considered two separate years' data for each farm. The choice of the years chosen could have affected the economic results, as economic performance does vary from year to year according to variations in the weather and prices etc. In future it would probably be more advisable to choose average results from a farm in order to make the economic evaluations. Finally, it became apparent during the project that a period of 3-5 years from conversion is too short a time to assess the full impact of conversion to organic production on the sustainability of a farm.

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