The land cost of agrarian sustainability. An assessment
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ABSTRACT
Improving the sustainability of farms often incurs additional costs for farmers. These costs come from allocating land to the maintenance of the ecological processes (energy and material flows, natural population regulation) required for the agroecosystem to function. Since these costs are not recovered on the markets, farmers see a fall in profits, the financial viability of their farms is compromised, and they suffer the consequences of the environmental services they are providing. All this makes it essential to implement government policies designed to compensate farmers for their efforts. The issue of how to assess sustainability has generated widespread debate within ecological economics, specifically as to whether it is possible to place a monetary value on it and if so, how this should be done. In a previous article we showed that agrarian sustainability involves a land cost, therefore this cost can be translated into monetary values. The purpose of this study is to develop this concept in practical terms by applying it to organic farming. We calculated the land cost of agrarian sustainability (LACAS) in order to compare organic versus conventional management in olive farming, as this crop is grown extensively in Spain and other Mediterranean countries. The results show that the agro-environmental subsidy is not enough to encourage olive growers to make the conversion from conventional to organic methods, because the land cost of sustainability is not adequately offset. They also show that improving agroecosystems can allow the land to take on more functions without increasing the land cost. In our case, encouraging the multifunctionality of the land has permitted a reduction in this cost. The LACAS could be a useful tool, not only for drawing up government policies designed to support organic farming, but also for improving the sustainability of the agrarian sector.

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Introduction
In this paper we aim to develop the concept of the land cost of agrarian sustainability (LACAS) in practical terms, having already discussed its theoretical aspects in a previous essay (Guzmán and González de Molina, 2009). In doing so, we aim to demonstrate the usefulness of this analytical tool – to determine, for example, the state of an agroecosystem in terms of sustainability, or the additional costs incurred in financial terms by farmers when they incorporate sustainable management practices into their farms. It is a particularly useful tool for organic farming. Usually, organic farmers are at a disadvantage compared with conventional farmers. The reason is that the latter depend less heavily on land, as they import large amounts of energy and nutrients from fossil and mineral sources. At local or at individual farm level, from the point of view of productivity, a certain amount of land is required to obtain enough energy and nutrients to meet the needs of the production process. From the point of view of stability and resilience, biodiversity plays a crucial role not only in the control of pests and diseases, but also in the stability of yields.

To this extent, organic farming has to “pay” a cost in terms of land which is not paid by conventional farming. The growth rate of organic agriculture is encouraging (IFOAM, 2009). However, incentives for its growth, which are basically limited to a higher price tag for its products, do not appear to be sufficient. Government policies designed to support this sector should compensate for the land cost incurred by organic farmers to increase the sustainability of their farms.

This paper is divided into four sections, the first part of which summarizes the concept of land cost of agrarian sustainability (LACAS). In the second section, the sources and methodology used for its calculation are outlined, based on a case study: a comparison of olive growing in conventional and organic farming in southern Spain. The third section presents and discusses results and the final section states our main conclusions.