



Indicadores de sostenibilidad de la agricultura y ganadería españolas

1^{er} informe - Marzo de 2011



PLATAFORMA TECNOLÓGICA
DE AGRICULTURA SOSTENIBLE

REALIZACIÓN DE UN ESTUDIO DE DETERMINACIÓN Y SEGUIMIENTO DE LA EVOLUCIÓN DE INDICADORES DE SOSTENIBILIDAD AGRO-ALIMENTARIOS

--Resumen--

Madrid, marzo de 2011

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Proyecto realizado mediante convenio suscrito entre el Centro de Estudios e Investigación para la Gestión de Riesgos Agrarios y Medioambientales (CEIGRAM, UPM) y la Plataforma Tecnológica de Agricultura Sostenible

EXECUTIVE SUMMARY

This study attempts to provide a general and integrated vision of the main sustainability indicators of Spanish Agriculture, and the role played by agricultural technologies. The study looks at a number of socio-economic and environmental indicators, adopting a double approach that includes a review of agriculture as a whole and a selection of key plant and animal productions. The perspective of the study includes statistics dating back to 1980 and ending in 2008, spanning nearly three decades of evolution. The results have been referred to the whole of the Spanish agriculture, but the basic information used is referred to the provincial level.

In summary, the statistical analysis and literature review have been oriented towards obtaining indicators of productivity and sustainability of easy interpretation, which afford also continuous observation over the years. The trend analysis of indicators provides an overview on the number of physical units - natural resources or environmental indicators - that is required to obtain one unit of product or production value (euro). This has helped answered the following questions:

- What are the physical and environmental bases of the main crops and livestock in Spain and how have they evolved over time?
- How have major macroeconomic variables, productivity and the contribution of labor in agriculture evolved?
- From the standpoint of the consumer, how prices of food basic commodities have evolved compared to the general indicators of consumer prices?

As regard the environmental indicators, it is concluded that Spanish agriculture consumes increasingly less water and energy, loses less soil to erosion, and emits less GEIs to produce one unit of output (kg, liters), and one euro of value. Even though there are differences in the extent and pace with which the indicators have evolved the analyzed products, the productivity gains have resulted in significant sustainability improvements in agriculture.

Productivity gains in maize, sugar beets, vineyards, olive orchards, water melon and tomato have surpassed 200%, requiring in the present time a fraction of the volume of water, land extension and energy that were needed 30 years ago. In the other analyzed crops, sunflower, citrus, wheat, and barley, productivity grew between 25 and 70%, being that growth remarkable as well, but exhibiting trends that have leveled off in the last decade. This slowdown is explained by the fact that they represent crops primarily grown under rainfed conditions. In the case of cereals and sunflower, show slower productivity gains because these

crops are grown primarily under rainfed regimes, as for the case of citrus, it is due to the substitution of traditional seasonal varieties, more adapted to the climatic conditions, with early and very late varieties with lower yields.

The growth in the crops' potential to fix CO₂, associated with the productivity growth in biomass, is also remarkable. The indicator of euro per Ton of CO₂ shows the residual cost of fixing carbon by a given crop. Trends of this indicator grew steadily for all crops except for wine grapes, which declined. The indicator ranges from 30 to 6000 euro of Ton of CO₂, respectively for cereals and tomato. A comparison of these figures can be made with the price of carbon permits, now 15 euro per Ton approximately, suggesting that the value of food production is greater.

In this preliminary study, three animal products, pork and chicken and eggs have been considered, evaluating direct water use and greenhouse gas emissions. Direct water use for this three productions totals jointly represents 0.071% of total water availability in Spain. In regard to GHG emissions, in 2008 these productions contributed to 2.5% of all national emissions. In terms of the output of livestock farms, direct water consumption and emissions of CO₂-equivalent and nitrous oxide have diminished between 4% and 22% in the period 1990- 2008.

The relative reduction of water consumption and GHG emissions can be partially explained by the improvement of feeding and reproduction efficiencies. As the tendering of herds devoted to reproduction has become more efficient, use of water and GHG emissions per unit of output have diminished. While not explicitly covered in the study, feeding efficiency gains contribute to improve the sustainability indicators of the three studied animal sectors. Gains in feed-to-product conversion rates result in lesser water needs and lower manure production (lesser methane and nitrous oxide) per unit of production.

In terms of Total Agricultural Output, Spanish agriculture has followed a steady upward trend from 1980 to 2003, with a small trough due to adverse climatic conditions between 1989-1992. Between 1993 and 2003, the total value of farm output doubled. After 2003, farm output has declined, except for the small spikes in 2007 and 2008 due to the rise of commodity prices.

Farm income also grew from 1980 to 2003, doubling in real terms. Yet, since 2003 farm income has steadily declined, so that in 2008 stood at levels of the mid-nineties. The reasons behind this negative economic performance of the sector are the increase of input prices and the drop or stabilization of commodity prices at farm level, except for the sudden rise of milk, cereal and protein crop prices during 2007 and 2008. Between 2005 and 2008, while the index of farm prices grew by 11.2%, input prices augmented by 34.5%.

The unfavorable evolution of input and commodity prices stands in contrast with the growing divergence between the index of consumer prices of fresh products and the prices of the same

products at the farm level. Between 1980 and 2008, consumer prices of vegetables grew by a factor of 7, whereas at the farm level prices changed by a factor of 3.5. For fruits, the indexes grew by 5.5 at consumption level and by 1.8 at farm level, and for milk the factor prices the factors were 4 and 2.5, respectively. Clearly, consumer price indices for fresh products grew much more than those at the farm level.

A joint analysis of the trends of both consumer and farm prices with that of farm prices and input prices suggests that farmers have increasingly been losing power along the food value chain, which explains in part the decline of farm income in the last years referred above. It is thus necessary to keep on improving farms' production efficiency to increase their economic performance.

From the consumers' perspective, the consumer price indices for meats and eggs have grown less than the Consumers Price Index (IPC, in Spanish), indicating that the efficiency gains in the livestock have been passed on to the consumers. However, consumer price indices of fresh fruits and vegetables rose above the IPC.

Finally, the growth of total agricultural production and farm income observed until 2003 has been accompanied by an important reduction of agricultural employment. Jobs have been lost continuously since 1980, but since the 90s they began leveling off. The decline of farm labor is primarily associated with the reduction of family labor, which has been slightly offset by increases of hired labor. This restructuring of the labor force responds to a process of modernization and strong capitalization of Spanish agriculture.

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te invita a la jornada "SOSTENIBILIDAD AGRARIA Y
TECNOLOGIA: LOS RETOS DEL SIGLO XXI", cuya
inauguración correrá a cargo de **M^a Isabel Salinas**,
Secretaria General del Mercado Rural y la
Producción Ecológica y que será clausurada por
Judit Andú, Directora General de Producción
Agrícola y Ganadera.

Fecha: 21 de diciembre de 2010 - 10:00 horas
Lugar: Salón de actos de la Consejería de
Agricultura y Pesca de la Junta de Andalucía
Dirección: C/ Tapadillo 5/A
41013 Sevilla



JORNADA PLATAFORMA

Jornada 'Sostenibilidad agraria y
tecnología: los retos del Siglo XXI'

Sevilla, 21 de diciembre, a las 10:00 horas,
en el Salón de Actos de la Consejería de
Agricultura y Pesca

En colaboración con la Consejería de
Agricultura y Pesca de la Junta de
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Proyecto Financiado por:

