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Partnering biodiversity and income on French farmlands

Striking a sustainable balance between making a profit and maintaining biodiversity on agricultural lands is challenging. A new French study has combined economic and ecological models and indicated that a simple combination of taxes and subsidies could promote economic performance on farms, whilst conserving bird populations.

Biodiversity has been declining in Europe, mainly as a result of habitat loss and a decline in habitat quality. Birds have been particularly affected, especially farmland species that have been affected by changes in European agriculture, such as intensified farming and land abandonment. To help identify vulnerable areas, the EU has adopted the Farmland Bird Index[1] as an indicator of biodiversity change. However, farmers also need to earn income and, in order to promote sustainable environmental schemes, both economic and ecological criteria must be considered.

The study proposed a bio-economic model to analyse possible policies to support biodiversity whilst ensuring a viable income for farmers. The ecological part of the model estimated the abundance of 34 bird species that live on French farmland. This is measured by the Farmland Bird Index that considers birds that can only live on farmland and an index used in the French Breeding Bird Survey (STOC) that considered both specialist farmland birds and more generalist birds.

The model considered the impact of four policy scenarios for the period up until the year 2050. These were a cereal scenario with subsidies for cereal crops, a grassland scenario with subsidies for permanent grassland, a double subsidy with subsidies for both cereals and grassland, and finally, a High Quality Environmental (HQE) scenario which taxes cereal crops and redistributes the taxes as subsidies for permanent grassland. This last scenario had the lowest cost of all the scenarios.

Economically speaking, the HQE scenario would provide the most economic benefit in 2050 at both a regional level (an increase in income of about 83 per cent from 2008) and a national level (an increase in income of 60 per cent from 2008). The grassland and the double subsidy scenarios are the least efficient. Ecologically speaking, the HQE scenario would be again more effective as measured by both indexes, whilst the Cereal scenario would be least effective.

The study analysed the HQE policy in more depth with four levels of taxation for cereal crops (and therefore subsidies for grassland). With greater taxes (and subsidies) the economic gains are always greater. In terms of biodiversity, it appears there is an improvement at low and medium levels of taxation, but at higher levels there is a negative ecological effect. This is because at high levels there will be a much greater amount of grassland than cropland and many farmland birds that are adapted to cropland would be adversely affected.

The results indicated that both ecological and economic benefits from farmland are affected by public policies for agriculture and land-use. The research only looked at basic policies, i.e. subsidies and taxes, but these appeared to be central to shaping both biodiversity and income.

The researchers highlighted that the results depend on the indicators used, for example, an indicator for general bird biodiversity (STOC) could not distinguish between all policy options, but an indicator for specialist farmland birds (Farmland Bird Index) could. They conclude that balancing ecological and economic performance is possible, but not straightforward. Issues that policy makers need to consider are the synergy between different policies, the time frame of the instruments, which indicators to use and how to prioritise between ecological and economic objectives.

1. See: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsien170

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