

Science for Environment Policy

Balanced approach to restoring farmland biodiversity shares and separates land

It is possible to balance agricultural production with improved biodiversity on farmland, according to researchers. A new study suggests using a combination of land sharing techniques, which enhance biodiversity on existing farmland, with land separation techniques, which designate separate areas for conservation and farmland production.

The expansion of agriculture and intensification of farming methods plays a large part in environmental degradation. Recent discussions about restoring damaged ecosystems on farmland have centred on two approaches.

The first approach is 'land sharing', where farmland is maintained for agricultural production, but is enhanced to promote biodiversity and ecosystem services. Land sharing techniques include conversion to organic farming, transforming crops and pastures into agroforestry and adopting traditional farming practices, such as using manure as fertiliser or crop rotation.

The second approach is 'land separation', which involves restoring or creating non-farmland habitat in agricultural landscapes to house biodiversity. For example, areas can be specifically designated for woodland, natural grassland and wetland.

Previous research indicates that both approaches have the potential to enhance: 1.) biodiversity, 2.) agricultural production and 3.) other ecosystem services, such as nutrient cycling and reduced soil erosion. Land sharing, or the promotion of environmentally-friendly farming, can provide these triple benefits within the farmed field as well as for and across the wider landscape. However, land separation can only provide triple benefits at the landscape level, which could lead to difficulties in encouraging farmers to adopt these techniques.

The study suggests that, rather than contrasting these approaches, they should be used in combination to maximise benefits to farmers, the environment and the surrounding community. It provides the example of 'woodland islets' as an intermediate approach, which involves planting a number of small, densely planted groups of native shrubs and trees that are scattered over agricultural land, occupying only a small area (less than 1%) of the land. These maximise biodiversity benefits by providing patches of habitat across the farmland and do not interfere with agricultural production, potentially enhancing it through the provision of ecosystem services.

The study does highlight the current lack of uptake of either of these approaches. To encourage greater adoption, it recommends a closer relationship between the sciences of restoration ecology and agricultural production. It also suggests that individual farmers need clear rewards for adopting these approaches. This could be in the form of tax deductions for landowners who take up these measures, donations to not-for-profit organisations that run restoration projects on farmland (so they are free to farmers), and payments for ecosystem services, such as water purification, flood mitigation and carbon sequestration.

The study also highlights the need for widespread education at various levels to promote greater awareness of the benefits of restoring ecosystems.



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