# New research reveals complexities in agricultural intensification and expansion impacts on biodiversity



Recent research published in *Nature Ecology & Evolution* raises new questions regarding the impacts of agricultural practices on biodiversity, challenging the long-held belief that intensification—boosting productivity on existing farmland—is always preferable to expansion, which involves converting natural land into agricultural fields. The study was conducted by a team led by Dr. Silvia Ceaușu from the UCL Centre for Biodiversity & Environment Research and included contributions from researchers across various institutions.

Dr. Ceaușu noted, “Feeding the global human population comes at an increasing cost for our planet’s biodiversity. To mitigate this, the common assumption is that intensifying agricultural practices is always less detrimental to biodiversity than farmland expansion." However, the findings indicate that the relationship between agricultural practices and biodiversity is more complex.

The researchers undertook a comprehensive global assessment examining the impact of farmland intensification and expansion on biodiversity using an extensive database of biodiversity metrics, natural vegetation data, and agricultural yield estimates. They focused on four major crops—maize, soybean, wheat, and rice—that account for a significant proportion of global calorie production.

In their analyses, the team evaluated parameters such as species richness and total abundance within agricultural areas, along with the surrounding ecosystems. Their results revealed that both intensification and expansion have detrimental effects on biodiversity, though the extent of harm varies depending on region, crop type, and the characteristics of remaining natural vegetation.

The conclusions from the study suggest significant implications for global agricultural policies and trade initiatives. Specifically, many policies geared towards ending deforestation focus on sourcing crops solely from established farmland, a simplification that may not reflect the complexities identified in their research.

Co-author Professor Tim Newbold remarked, “Finding the most sustainable way to increase crop yields is very complicated and depends on numerous factors.” He emphasised that there is “no one-size-fits-all solution for sustainable agriculture,” underlining the need for more nuanced approaches tailored to specific local contexts.

The researchers propose that instead of blanket recommendations, farmers should consider sustainable intensification strategies, including methods like biological pest control and maintaining patches of natural vegetation between farming fields to support local biodiversity. Furthermore, they highlighted the importance of consumer behaviour in addressing the sustainability of agricultural systems, advocating for reductions in food waste and meat consumption.

It is important to note that this study exclusively examined existing agricultural areas and did not advocate for the conversion of untouched ecosystems into farmland. Dr. Newbold stated, “We would not suggest expanding farmland into intact natural areas as it is vital for the planet that such unmodified landscapes are preserved.”

In conclusion, the study underscores the complexity of aligning agricultural productivity with biodiversity conservation, suggesting a careful re-evaluation of how expansion and intensification are balanced in agricultural landscapes. As the world continues to seek solutions for food demand amid the biodiversity crisis, this research calls for a reconsideration of strategic approaches informed by local conditions and environmental consequences.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://www.nature.com/articles/s41559-020-1262-y> - This article discusses the integration of agroecological principles into the post-2020 Global Biodiversity Framework, emphasizing the need for sustainable agricultural practices to conserve biodiversity.
* <https://www.nature.com/articles/s41559-018-0757-2> - This study analyzes the resilience of agro-ecosystems to changes in farming management, highlighting the importance of ecological networks in maintaining biodiversity.
* [https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(24)00202-7](https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347%2824%2900202-7) - This article examines how agrobiodiversity conservation can enable sustainable and equitable land sparing, supporting the idea that intensifying agriculture without harming biodiversity is possible.
* <https://www.pnas.org/doi/full/10.1073/pnas.2303937120> - This research demonstrates that diversified farms can bolster forest-bird populations, even amid ongoing declines in tropical forests, supporting the notion that biodiversity conservation can coexist with agricultural practices.
* <https://apnews.com/article/81477df2e7d5bdb8673e533a91d6e794> - This news article reports on a study finding that birds nesting in agricultural lands are more vulnerable to extreme heat, underscoring the impact of agricultural practices on biodiversity.
* <https://www.nature.com/articles/s41559-017-0227-2> - This study shows that grassland biodiversity can be conserved without reducing overall production, indicating that agricultural intensification can occur without harming biodiversity.
* <https://news.google.com/rss/articles/CBMitwFBVV95cUxOdUkzRmFzTmNqdjQ2d19yUjlYcHYyOEdiQUVZWjVBQUZWVFBwb2I5OFV2X2h1QU15MXVUdmNPaEdqYzNLdlRSVVBRZ1dQTVhXRVphVkFEb19kTXFXVy1ySWtYQllNbE5DaW0xZ3BrLVE5Yl9fRkxmcHBfYmNTaGw4eGp3TTNlMVc5VXZ1R0Frak84UklDaDdBbE9UbVZEWjB3U1ZtRlUyV193Sk5sV3JUZklRZlgxR0k?oc=5&hl=en-US&gl=US&ceid=US:en> - Please view link - unable to able to access data