

Shade-grown coffee demonstrates the benefits of combining agriculture and conservation

March 14 2024



A coffee farm in Java. Credit: Sophie Manson

Increasing shade cover over coffee plants can increase biodiversity and provide new ways to combine agriculture and conservation, a new study has revealed.

Coffee grown in high shade, with more than 30% canopy cover, provides a home to more plant and [animal species](#) than coffee grown in the sun or on low shade farms with less than 30% canopy cover, the study found.

Preserving biodiversity is good news for farmers as it means better natural pest control and improved soil quality. The quality of the coffee produced also actively improves with increased shade.

Sophie Manson, a Ph.D. student, and the lead author led a team from Oxford Brookes University's Nocturnal Primate Research Group Team. Manson said, "Agriculture is one of the greatest threats facing species around the world. Whether it is cutting down trees to make way for farms or using chemical pesticides and fertilizers, bad farming practices can hold dire consequences."

"Yet it doesn't have to be this way. Paving the way in combining agriculture and conservation, shade-grown coffee has the ability to challenge our perception of agriculture and reframe the way we look at farming. Weaving agriculture into conservation initiatives, through practices such as shade-grown coffee, will enable countries to reach biodiversity targets and maintain their rich cultural and ecological heritage."

Dr. Marco Campera, a co-author of the paper, said, "We showed that several groups of species with important roles for ecosystems and humans, such as pollinators, are penalized by shade tree removal. This, in turn, can lead to a loss in profits for farmers and cause management costs to increase through agrochemicals. Therefore, traditional ways of cultivating coffee and other non-timber forest products, such as growing them under shade, should be prioritized."

The research began with keyword searches of relevant academic research into the effects of shade on biodiversity in coffee farms.

Specific criteria were then used to analyze 1,900 relevant research papers on the subject.

The Nocturnal Primate Research Group Team, which has one major project that focuses on West Java, Indonesia, also found some species, for example, mammals like slow lorises and plants such as ferns and orchids, that need high shade to survive.

Co-author Professor Anna Nekaris OBE, Professor in Primate Conservation at Oxford Brookes University, said, "What this means is that if we want to conserve mammals and air-purifying ferns and orchids, we can only do that in areas of high shade. Low shade simply isn't enough."

The study also noted that location is vital when considering shade cover. Studies in Latin America indicate that species diversity increases in farms with higher canopy cover, studies in Africa showed the opposite trend.

Manson said, "What may work in one place may not apply elsewhere—a rule to bear in mind when considering any conservation initiative.

"The study shows the benefits of shade-grown coffee and we are keen to promote the benefits. However, this can only be done on the understanding that further destruction of forests for any form of agriculture will render the value of [shade](#)-grown coffee entirely redundant. Our focus now should lie in conservation and how we can optimize productivity alongside biodiversity."

The study is [published](#) in the journal *Science of The Total Environment*.

More information: Sophie Manson et al, Effect of shade on biodiversity within coffee farms: A meta-analysis, *Science of The Total Environment* (2024). [DOI: 10.1016/j.scitotenv.2024.169882](https://doi.org/10.1016/j.scitotenv.2024.169882)

Provided by Oxford Brookes University

Citation: Shade-grown coffee demonstrates the benefits of combining agriculture and conservation (2024, March 14) retrieved 29 April 2024 from <https://phys.org/news/2024-03-grown-coffee-benefits-combining-agriculture.html>

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