

# Study reveals escalating cost of forest conservation

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In the face of unprecedented deforestation and biodiversity loss, policy makers are increasingly using financial incentives to encourage conservation.

However, a research team led by the National University of Singapore (NUS) revealed that in the long run, conservation incentives may struggle to compete with future [agricultural yields](#).

Their findings were first published online in the *Proceedings of the National Academy of Sciences* on 15 April 2013.

## Financial incentives for conservation

Incentives are being leveraged in dozens of tropical developing countries to conserve forests, to protect biodiversity and reduce [carbon emissions](#) from deforestation. This incentive-based approach is comparatively inexpensive, as low agricultural yields and widespread poverty often mean that relatively small incentives can motivate many landholders to protect their land for conservation.

As a result, this approach has become a leading [climate change mitigation](#) strategy adopted by the United Nations as policies for Reducing Emissions from Deforestation and Degradation.

## Costs of conservation in the long run

In a bid to assess the future viability of these types of conservation programmes, the team, comprising researchers from NUS, ETH Zurich and University of Cambridge, developed a framework and model that looked at the strategy's effectiveness in the context of intensified farming practices.

The researchers modeled conservation payments necessary to protect forests in the [Democratic Republic of Congo](#) (DRC), which has some of the largest remaining forests in the world. They found

that a new [agricultural intensification](#) and conservation programme could double or triple cassava and [maize yields](#) by introducing disease-resistant plant varieties, increasing fertilizer use and improving [farming practices](#).

Increased farm yields will bring dramatic benefits to DRC farmers, and could increase land area spared for conservation. Similar agricultural intensification policies are being promoted across the tropics.

However, the researchers highlight how those higher yields and incomes will also increase financial incentives for farmers to clear more forest for agriculture. As a result, [financial incentives](#) to encourage farmers to protect forests and not expand agriculture would need to escalate as well. They expect farmers who were once willing to protect forests for a comparative pittance could, in a matter of years, demand more for their conservation actions. Small-scale farmers might also be displaced by larger commercial ventures as farming becomes more lucrative, and as profits increase with growing global demand for agricultural products.

After taking these factors into account, the researchers found that while the current costs of forest conservation in many countries are very low, future changes in agricultural practices could radically increase the cost of conservation.

## Escalating cost is top concern

The NUS-led study illustrated that these contemporary policies tend to focus on short-term conservation and on improving the livelihoods of poor communities around forested areas. However, they risk overlooking impacts of on long-term conservation.

The researchers warn that conservation expenditure will have to dramatically increase to compete with future agriculture.

Said Jacob Phelps, a PhD candidate in the Department of Biological Sciences at the NUS Faculty of Science and first author of the study, "Our research suggests that as agriculture becomes more intensive, the small payments successful at incentivising forest conservation today could increase to well beyond what is considered economically efficient, or even feasible. We anticipate that similar patterns are likely across the tropics, including in places like Indonesia."

Provided by National University of Singapore

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