

Agrarian settlements drive severe tropical deforestation across the Amazon

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Resettlement projects in the Amazon are driving severe tropical deforestation - according to new research from the University of East Anglia and Câmara dos Deputados (the Brazilian Lower House).

Widely hailed as a socially responsible and 'innocuous' strategy of land redistribution, agrarian reform settlements have been created throughout the Brazilian Amazon since the early 1970s at an unprecedented scale.

But a study published today in *PLOS ONE* reveals that these farmer resettlement projects are far from environmentally friendly or socio-economically beneficial.

The research shows the drastic effects of nearly 2,000 agrarian settlement areas on [deforestation](#) and forest degradation in the world's largest tropical forest region.

It reveals that these settlement areas, which amount to 5.3 per cent of the 5 million km² Brazilian Amazon, have contributed to 13.5 per cent of all deforestation mapped to date.

Lead author Dr Mauricio Schneider, of the Office of Legislative Council at Câmara dos Deputados, said: "Agrarian settlements have been widely hailed by Brazilian society as a socially responsible strategy to allocate land to the rural poor. But our research shows that allocating forested land results in severe levels of deforestation at the taxpayer's expense."

Prof Carlos Peres, from UEA's School of Environmental Sciences, said: "We analysed satellite imagery of the 1911 agrarian settlements allocated to 568 counties across the entire Brazilian Amazon. This enabled us to quantify rates of natural vegetation conversion across these settlements. We also compared fire incidence and [deforestation rates](#) before and after the official occupation of settlements by migrant farmers, mostly from southern Brazil.

"Contrary to claims by Brazil's Agrarian Reform Ministry, the timing and spatial distribution of deforestation and fires provides irrefutable chronological and spatially explicit evidence of rapid deforestation by resettled farmers both inside and immediately outside agrarian settlement areas."

Key findings:

- The Brazilian agrarian reform programme moved around 1.2 million settlers to Amazonia since the 1970s.
- Settlement projects account for 267,092 km² or 5.3 per cent of the region but 13.5 per cent of all deforestation mapped to date.
- Forest cover within settlements declined to an average of 43.5 per cent as deforestation rates and forest fires increased.
- Poor sectoral coordination between government agencies results in severe conflicts of interest between environmental and development policy.

Prof Peres said: "It is known that migrant farmers worldwide catalyse the expansion of tropical deforestation frontiers. But contrary to common-sense notions that Amazonian deforestation is merely a product of rampaging capitalist development unleashed by free market forces - it is primarily a governance problem that is deliberately designed and deployed by government, and financed by Brazilian tax-payers - most of which would like to curb rather than accelerate deforestation and forest

degradation in the Amazon.

"INCRA, the Brazilian Agrarian Agency, claims that deforestation almost always occurs prior to the establishment of new land reform settlements. However, our research shows that this assertion is far from entirely true and that land use by settled smallholders greatly increases forest loss."

Dr Schneider said: "Environmental, agricultural and social policies of the Federal Government are supposed to be harmonized, but central government ministries compete against each other, and the Ministry of Environment seems to be the 'weakest link' whenever it confronts the agrarian reform program. As a result, Treasury money is used to either fuel deforestation in agricultural frontiers or initiate deforestation in more remote, pristine areas."

"The agrarian agency frequently establishes settlements within protected areas, and there is also strong evidence of settlers producing illegal charcoal for iron ore metallurgic plants."

This is the first study to analyse land cover changes both before and after settlement establishment and occupation. Further research focused on the use of federal public funds to subsidize Amazonian farmers, regardless of land use restrictions established by the Brazilian Forest Code.

Prof Peres added: "Given the enormous supply of cheap unoccupied land, Brazilian Amazonia continues to attract a large contingent of economic migrants from more populated regions. This is a huge challenge because as many as 4.8 million families in Brazil may be willing candidates for government-subsidized land redistribution programs in undeveloped forest hinterlands. This is a major policy contradiction, given efforts by other government agencies to slow down

deforestation in the Amazon."

"This form of government investment will hardly eradicate or reduce rural poverty, because of poor infrastructure and the severe economic inefficiencies of most agrarian settlements - which often result in high household-level turnover and giving-up rates of newly settled farmers following the local liquidation of natural forest resource capital."

More information: *PLOS ONE* published 23 Jul 2015 [DOI: 10.1371/journal.pone.0132830](https://doi.org/10.1371/journal.pone.0132830)

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