



# can paying 4 global ecosystem services reduce poverty?

les paiements pour les services écosystémiques globaux peuvent-ils réduire la pauvreté?

[www.p4ges.org](http://www.p4ges.org)

## How effective are conservation investments in reducing deforestation and fires in Ankeniheny-Zahemena Corridor, Madagascar?

Billions of dollars are spent on conservation around the world to reduce local communities' dependence on forests and prevent forest loss and degradation. However, outcomes of these investments are often not evaluated.

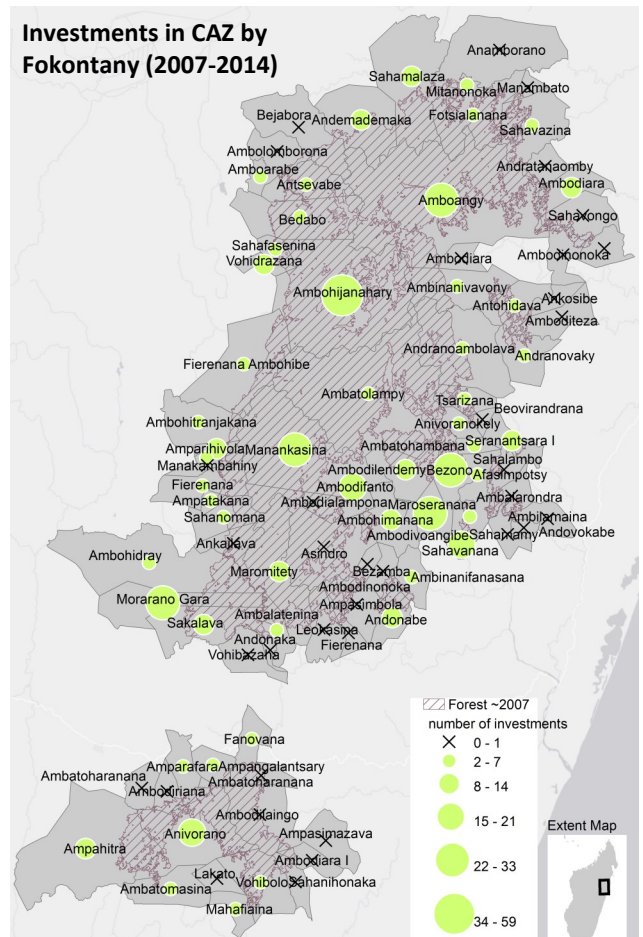
We evaluated 600+ conservation investments that occurred from 2007 through 2014 and the conservation outcomes (deforestation rates and forest fires) within Ankeniheny-Zahamena Corridor (CAZ) in Madagascar.

Deforestation and fire incidence were highest during political election years (2007 and 2013) and during the aftermath of the 2009 coup.

Our results indicate the presence of investments over the 8 year time period led to a small reduction in fires, but not in deforestation.

However, investments were related to reduced deforestation in 2010 and 2011; indicating that investments may have abated deforestation rates during times of political instability or lack of governance.

Investments in CAZ by Fokontany (2007-2014)



### Conclusions and recommendations:

Our findings suggest that investments can reduce deforestation and fires, but that there are many challenges and complexities in assessing conservation outcomes in a dynamic landscape mosaic in a volatile political context, where investments are targeted to high risk areas. In order to rigorously assess the effectiveness of REDD+ and forest conservation projects, more precise location information, proper documentation, and open-access records of all investments in a given region are needed.



This work was part of the p4ges project (can paying for global ecosystem services reduce poverty?) funded by the Ecosystem Services for Poverty Alleviation programme. For more information please see [www.p4ges.org](http://www.p4ges.org) or contact [julia.jones@bangor.ac.uk](mailto:julia.jones@bangor.ac.uk)

## Study details:

We demonstrated robust scientific evidence on the conservation impacts of investments by evaluating the relationships between conservation investments and conservation outcomes (deforestation and fires) within CAZ using a linear fixed effects panel regression.

We created a new and unique dataset that represented the most comprehensive database of investments in CAZ for 2007-2014 by meticulously collecting timing and financial details on 600+ investments.

We derived annual changes in forest cover by digitizing forest change interpreted from 15-m panchromatic sharpened Landsat imagery. We used 1-km resolution thermal anomalies from MODerate resolution Imaging Spectroradiometer for annual fire counts.

Cumulative investments over the time period averaged 138 investments per year in CAZ. The lowest number of investments were between 2009 and 2013 when many investors withdrew funding from Madagascar immediately following the 2009 coup. (**Figure 1**).

Deforestation and fires varied both spatially and temporally over the time period, with most deforestation and fires occurring in the southeastern part of the corridor. Deforestation and fire incidence peaked during political election years (2007 and 2013) and during the aftermath of the 2009 coup (**Figure 2**).

We found a statistically significant correlation between conservation investments and reduced deforestation rates in 2010 and 2011 – years with accelerated deforestation in the study area – but not in other years. We found a stronger and significantly statistically relationship between investments and reduced fire occurrence in the region over the entire time period.

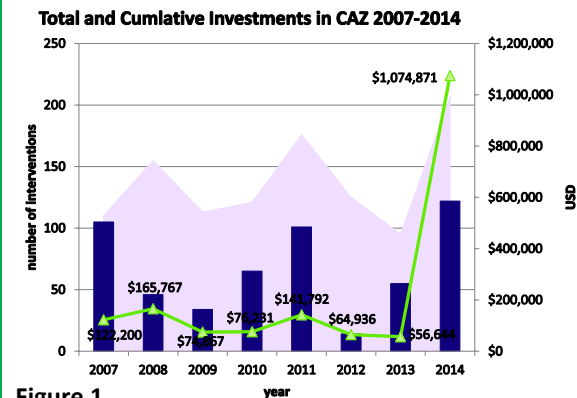


Figure 1

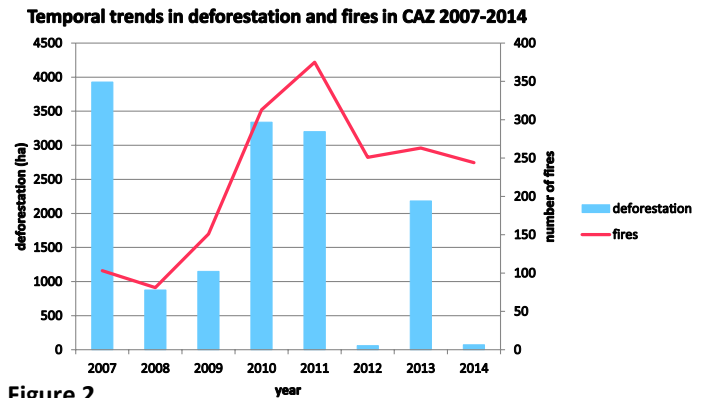


Figure 2

**Tabor, K., K. Jones, J. Hewson, A. Rasolohery, A. Rambeloson, T. Andrianjohaninarivo, and C. Harvey** (submitted). *Evaluating the Effectiveness of Conservation Investments in Reducing Deforestation and Fires in Ankeniheny-Zahemena Corridor, Madagascar.*

