

Exploring land-use returns to deliver incentives for restoration in Mato Grosso, Brazil

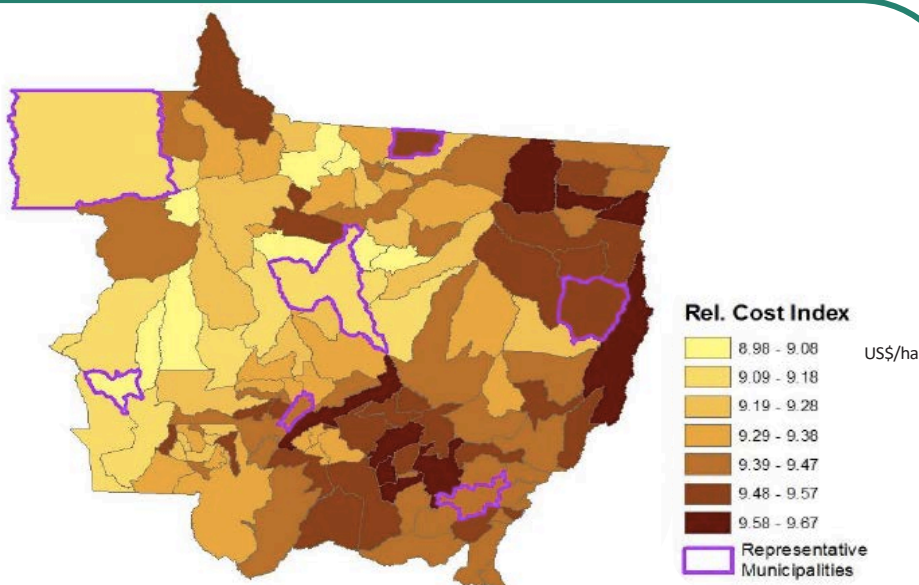


Figure: Lighter-colored, lower opportunity cost municipalities are concentrated in the central, western, and northwestern regions, while the eastern and southern regions contain the majority of especially high opportunity cost municipalities. Equally, these are the municipalities where restoration is more costly.

Source: LSE - London School of Economics

- › A new spatially explicit model of land use incentives under uncertain agricultural returns enables mapping the relative cost index of conserving forestland through Payment for Ecosystem Services (PES) for different municipalities in Mato Grosso, Brazil
- › In line with economic theory, the payment must be sufficient to outweigh the opportunity cost of the most attractive agricultural activity available to the landowner
- › Northwestern areas of Mato Grosso have a lower opportunity cost of standing forestland and thus represent a promising entry point for policymakers

Approach and aim

In the last fifteen years, the state of Mato Grosso has benefited from an increased level of enforcement of the environmental regulations which are in place and leads to a consequent significant decrease in deforestation rates. However, as agricultural production continues to represent an attractive land use in the state, there remains an important need for further policy development to help preserve forestland and minimize carbon emissions from deforestation.

If efforts to stem this forest loss are to succeed, it is critical to recognize that Mato Grosso's remaining forestland is heavily concentrated on large properties and private properties. Consequently, programs to reduce deforestation and promote restoration will need to incorporate incentives which are compatible with the decision-making of large private landowners.

In this context, it is important to identify the primary agricultural activities to which forestland is most frequently converted in Mato Grosso. The Instituto Brasileiro de Geografia e Estatística's (IBGE) 2015 Produção Agrícola Municipal (PAM), a survey of agricultural production at the municipal level, makes this clear – soy and corn production dominate cropland, together accounting for 88.7% of Mato Grosso's planted land area (IBGE, 2015). In addition, IBGE's parallel survey of livestock in 2014, the Produção da Pecuária Municipal (PPM), shows that cattle constitute 98.5% of the large-body animals raised in the state (IBGE, 2014). Taken together, soy, corn, and cattle production constitute around 90% of combined agricultural and livestock production in Mato Grosso.

Keeping these factors in mind, RESTORE+ has developed a data-

driven, spatially explicit model of land use incentives under uncertain agricultural returns and has further generated a relative cost index (RCI), representing the costs of land transformation, of conserving forestland through Payment for Ecosystem Services (PES) for different municipalities in Mato Grosso.

Main (interim) results

The figure above illustrates the RCI: for a PES scheme to incentivize a landowner not to convert their forestland to agricultural land, the payment must be sufficient to outweigh the net profits of the most attractive agricultural activity available to that landowner; this is the opportunity cost of standing forestland.

Next steps

The regional variations in our results are particularly relevant: as Mato Grosso lies in the southeastern region of the Amazon Basin, the outcomes are consistent with intuition that northwestern areas of Mato Grosso have a lower opportunity cost of standing forestland.

These areas of Mato Grosso are relatively more forested, which is consistent with the standard economic prediction that more easily exploitable resources will be used first. Thus, in the results of our model this correctly corresponds to a relatively low opportunity cost of forestland and thus a lower minimum payment for conservation.

More information and contacts:

Luca Taschini – LSE (L.Taschini1@lse.ac.uk)
www.restoreplus.org

Supported by:



based on a decision of the German Bundestag