Supplemental Materials

# **Text S1: Description of land boundary datasets.**

1. The Rural Environmental Registry (CAR, in Portuguese) was established in Mato Grosso in 2009 and is one of the inspirations for the national CAR (Sicar). It consists of a registry in which rural properties have their perimeter, legal reserve (LR) and permanent protection areas (PPA) geo-referenced. This dataset was used as the primary source of property spatial data.
2. The Unified Environmental License (LAU) was established in Mato Grosso prior to CAR and, initially, its objective was to be a complete registry with all information about a rural property for the purpose of environmental licensing. This registry is more complete and accurate than CAR, but it was soon replaced by CAR and it no longer operates. This dataset was used because some properties registered in LAU did not need to register again in CAR. When we conducted our analysis, these datasets were not yet integrated. Therefore we needed to aggregate them.
3. INCRA’s Certified Rural Private Lands is a dataset with the geo-referencing of rural properties. This dataset has the most accurate boundaries as this geo-referencing is validated and certified, thus decreasing overlaps and inaccuracy. INCRA’s dataset is not as comprehensive as CAR, but we used it in this analysis due to its enhanced geographical accuracy and because some properties in INCRA were not registered in CAR when this analysis was carried out.
4. The Terra Legal program is a federal government initiative to register and regularize consolidated land occupations of public areas without legal designation. Recently occupied lands cannot adhere to the program. It presumes that lack of land-tenure regularization fosters deforestation and poor environmental land-use as consolidated land-occupiers tend to abandon previously cleared areas and advance on forests when the former land’s productivity runs out. Thus, the program aims to legalize land invasions of up to fifteen fiscal modules in all the nine states of the Legal Amazon, recognizing family rights over land and applying all public instruments and policies for sustainable rural production and environmental compliance.