MATCH POINT: EMPIRICAL EVIDENCE FROM FOREST CONSERVATION LAW ENFORCEMENT IN THE BRAZILIAN AMAZON

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Regulatory enforcement of forest conservation laws is often dismissed as an ineffective approach to reducing tropical forest loss. Effective enforcement is, nonetheless, often a precondition for alternative conservation measures, such as payments for environmental services, to achieve desired outcomes. Fair and efficient policies to reducing emissions from deforestation and forest degradation (REDD) will thus crucially depend on understanding the determinants and requirements of enforcement effectiveness. Among potential REDD candidate countries, Brazil is considered to possess the most advanced deforestation monitoring and enforcement infrastructure. This study explores two unique datasets from Ibama (Brazilian Environmental Enforcement Agency). The first covers more than 20,000 spatially identified enforcement missions in the Brazilian Amazon from 2009 to 2011. The second has detailed information on each of the 1,000 most important of these missions, such as duration and coercion measure (e.g. fine and/or confiscation). The study aims at answering two fundamental questions: (1) have local deforestation patterns been significantly affected by field-based enforcement? And (2), which local and enforcement mission-specific factors are associated with observed changes in annual deforestation?

We organize our panel dataset in a spatial grid that links observed deforestation to interventions (enforcement missions) and local contextual factors, such as major land cover types, agricultural production indicators, accessibility, demographic, and broader economic as well as environmental variables. Grid cells with interventions are matched with grid cells that received no enforcement missions to answer our first research question. The second research question is addressed by linking outcomes to mission-specific and contextual indicators in a spatial econometric model.

Our results leave no doubt that field-based enforcement plays a major role in reducing deforestation over the observed time horizon. While deforestation in grid-cells without enforcement-missions also reduced over the observed time horizon, the effect was significantly stronger in cells, in which missions occurred. We also find that some intervention strategies were more effective than others, for example, missions that resulted in the confiscation of productive assets had a higher deterrence effect than missions that were limited to the issuing of fines. We do, however, also find location specific factors to have a significant impact on enforcement effectiveness, suggesting that a one-size-fits-all approach to enforcement is suboptimal.

Two policy implications of our findings arise: first, investments in improving the enforcement infrastructure and strategy after Amazonian deforestation rates peaked in 2004 paid off. Deforestation rates are, nonetheless, sensitive to enforcement frequency and intensity and reducing public spending for forest law enforcement is thus likely to result in rates picking up again. Second, although even field presence alone affects deforestation rates, enforcement effectiveness (but not necessarily costs) increase with pro-active in-situ coercive action, e.g. confiscation. The cost-effectiveness of field-based enforcement thus comes to crucially depend on mandates for immediate coercive action.