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Getting Greener by Going Black: The Priority Municipalities in Brazil

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August, 2014

A CPI Report

Acknowledgements

We thank the Brazilian Ministry of the Environment, and particularly Francisco Oliveira, for their continuous support. We are also grateful to Arthur Bragança, David Nelson, Dimitri Szerman, Elysha Rom-Povolo, Clarissa Gandour, Joana Chiavari, and Pedro Hemsley for helpful comments.

Descriptors

Sector	Land Use, Deforestation
Region	Brazil
Keywords	Deforestation, Priority Municipalities, monitoring;
Related CPI Reports	Production and Protection: A First Look at Key Challenges in Brazil (2013)
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Executive Summary

In 2007, 36 Brazilian municipalities were responsible for 45% of the deforestation in the Amazon Biome – an astonishing figure considering Brazil has 547 municipalities that transect the Biome. In 2008, the Brazilian Ministry of Environment set out to address this by blacklisting thirty-six municipalities, setting them as *Municípios Prioritários* (Priority Municipalities, or MPs). In following years, 14 more municipalities were added to the blacklist, seven in 2009 and another seven in 2011.

Because of the blacklist, the Brazilian Institute for the Environment and Renewable Natural Resources (Ibama), which operates as the national environmental police and law enforcement authority, focused law enforcement activities on MPs, issuing fines and embargoing farms who were caught deforesting illegally. These activities were complemented by a series of actions that were not explicit in the original government decree but included political commitments led by local governments, changes in the approval of subsidized credit contracts, the refusal of meatpacking plants to buy cattle from embargoed farms, and development of local plans for sustainable production. This project investigates the effect of the MPs policy on deforestation in the Amazon and the mechanisms through which the policy had effect.

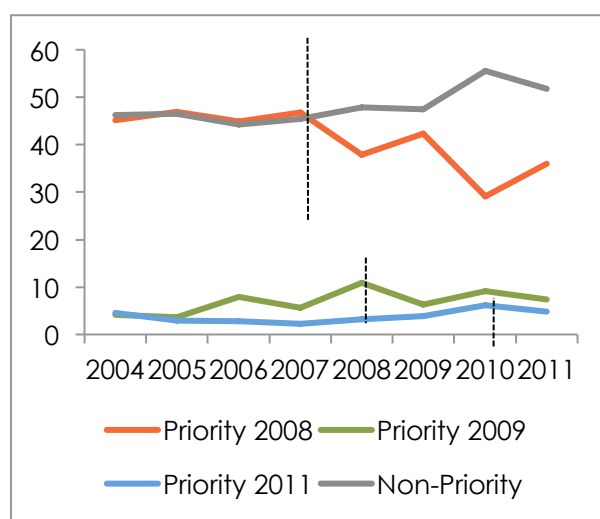
We find that the MPs policy avoided the clearing of 11,359 km² of Amazon forest area between 2008 and 2011. This area is roughly equivalent to the size of the country of Jamaica. Total deforestation observed between 2008 and 2011 was 20,689 km², 35% smaller than in the absence of the policy. In Figure 1, we

show the relative participation of the Priority Municipalities on total deforestation by year.

Total deforestation observed between 2008 and 2011 was 20,689 km², 35% smaller than in the absence of the policy.

While the blacklist made a clear difference, we also investigate what pieces of the policy had the most impact, finding that the mechanism through which the policy reduced deforestation was increased monitoring and better law enforcement activities in these municipalities. In contrast, the policy had no impact on credit concessions and other economic activities. This indicates that both preservation and economic growth can happen simultaneously in the Amazon.

Figure 1 – Relative Participation in Total Deforestation (%)



Methodology

We use an econometric model to compare how deforestation evolved in MPs with how deforestation evolved in non-listed municipalities. A key challenge with this method is that it requires relative homogeneity among listed and non-listed municipalities before the policy is enacted. In particular, deforestation paths are expected to be parallel before the policy.

As shown in Figure 2, the blacklisted municipalities are spatially concentrated – most of them are less than 300 km from the Amazon Biome border. Thus, to ensure the most comparable control group, we restrict our sample of both listed and non-listed municipalities to within 300 km of the Amazon biome frontier. These municipalities are more similar. A minor

drawback of this strategy is that a few listed municipalities are excluded from the analysis (see Figure 2 below).

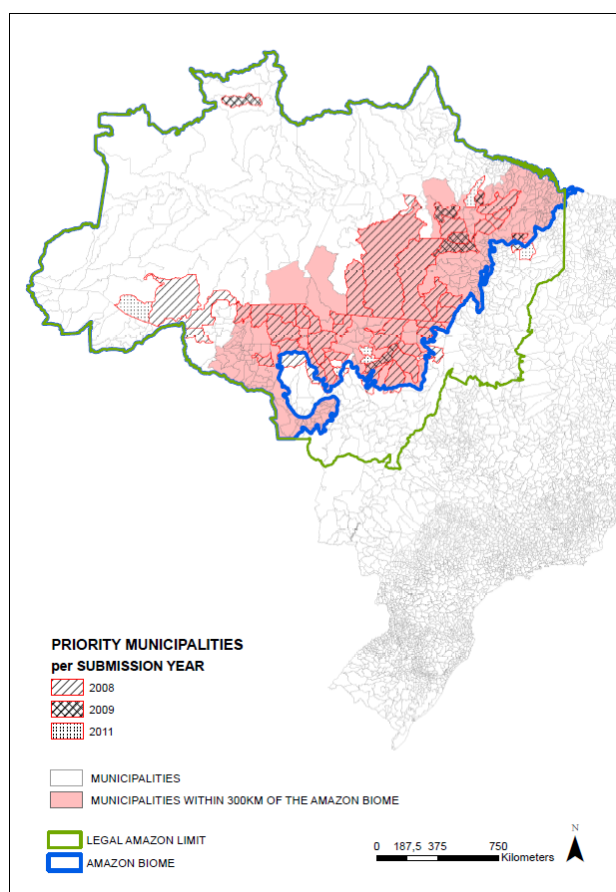
Results show that both the listed and non-listed groups had similar deforestation trends before the policy implementation, but, after policy implementation, the blacklisted group decreases deforestation more intensively than non-listed municipalities.

We also compare the evolution of other variables before and after policy implementation between groups. We compute the impact of MPs on agricultural GDP, crop production or credit (total, crops and livestock).

Institutional Context

Brazilian conservation policies were reformulated twice throughout the 2000s. The first change was made in 2004, with the launch of the PPCDAm (Action Plan for the Prevention and Control of Deforestation in the Legal Amazon), where satellite imagery and other efforts strengthened monitoring and law enforcement in the Amazon. The second change, which is our main focus, was in the creation of a blacklist to better target the efforts to combat illegal deforestation. The signing of Presidential Decree 6,321 in December 2007 established the legal basis for singling out municipalities with intense deforestation activity and taking differentiated action towards them. These municipalities, classified based on their recent deforestation history, were marked as in need of priority action to prevent, monitor, and combat illegal deforestation. Any Legal Amazon municipality could be added to what became known as the list of priority municipalities (MPs). Municipality-level

Figure 2: Priority Municipalities and Deforestation Arc



selection criteria for this list were: (i) total deforested area; (ii) total deforested area over the past three years; and (iii) increase in the deforestation rate in at least three of the past five years. Exiting the list of priority municipalities was conditioned upon significantly reducing deforestation. Issued in January 2008, MMA Ordinance 28 listed the first 36 priority municipalities. Seven municipalities were added to the list in 2009, and another seven in 2011.

Differential action taken in priority municipalities largely consisted of more rigorous environmental monitoring and law enforcement. Ibama monitored the municipalities more closely and dedicated a larger share of its resources to them. Licensing and geo-referencing requirements for rural establishments were harsher in MPs, and, in an effort to identify fraudulent documents and illegal occupations, private land titles were revised.

In addition to concentrating a large share of Ibama's attention and monitoring efforts, MPs also became subject to a series of other administrative measures that did not stem from Ibama. Although not officially established through legislation, these measures imposed an additional cost to being blacklisted. These actions included political commitments led by local governments, changes in the approval of subsidized credit contracts, the refusal of meatpacking plants to buy cattle from embargoed farms, and development of local plans for sustainable production.

As an example of how this set of policies played out on the ground, in Paragominas, a municipality in the State of Pará, the local government engaged

in reducing deforestation right after the list was published. The mayor's office, local producers associations and groups from the civil society signed a pact for zero deforestation. Under the new regime, the mayor's office started to support the monitoring and law enforcement implemented by the federal government, while the producers associations with support with NGOs organized a series of meetings and seminars to promote registry and titling, in order to improve property rights. As a consequence, the deforestation rates computed by the PRODES system was reduced from 64.1 km² in 2007/2008 to 18.2km² in the 2011/2012. In 2013, Paragominas became the first municipality to be excluded from the list.

The Impact of MPs on Deforestation and on Economic Activities

Our results indicate that the MPs policy significantly reduced deforestation. According to our estimates presented in Table 1, the policy avoided the clearing of 11,359 km² of forest area from 2008 through 2011. Total deforestation observed in the same period was 20,689 km², 35% smaller than in the absence of the policy.

We also study the relative importance of the monitoring and law enforcement portion of the policy, as measured by number of fines, in comparison to other political and economic actions that were enacted in conjunction. We show in Table 1 that the number of fines increases when municipalities are added to the list. There were 1,206 more fines between 2008 and 2011 than there would have been in the absence of the policy. The estimated number of fines in the absence of the policy in the period is 12,342, and the

Table 1: Deforestation and Number of Fines

	Deforestation in Square Kilometers			Number of fines		
	Estimated Deforestation	Observed Deforestation	Difference (Observed - Estimated)	Estimated Number of Fines	Observed Number of Fines	Difference (Observed - Estimated)
2008	12851	9580	-3271	3599	4149	550
2009	6573	4068	-2505	3063	3334	271
2010	6316	3690	-2626	2656	2864	208
2011	6310	3351	-2958	3023	3201	178
Total	32048	20689	-11359	12342	13548	1206

observed number of fines was 10% higher, at 13,548 fines.

Using the same database as for the case of the number of fines, we calculate the impact of MPs on agricultural GDP, crop production, and credit (total, crops, and livestock). Our estimates show that the MPs policy had no effect on these variables. These results suggest two important findings: 1. that the monitoring and law enforcement component was the primary driver of the deforestation slowdown determined by the blacklist policy; and 2. That combating deforestation in the Brazilian Amazon does not necessarily create obstacles for agricultural production, since the increased monitoring generated by the policy in listed municipalities reduced deforestation in the Amazon, but had no effect on economic activities in the region.

Policy Implications

Our analysis shows that the blacklist policy better targeting law enforcement activities effectively reduced deforestation in the Brazilian Amazon. This result yields two main policy implications.

1. Maintain targeted monitoring and law enforcement activities in the Brazilian Amazon. The MPs policy has successfully targeted law enforcement activities, thereby reducing deforestation in

municipalities that were responsible for an important part of deforestation in the Amazon Biome before the policy implementation. Additionally, our findings show that the policy change had no effect on agricultural production. This finding reinforces the case for relying on monitoring and law enforcement to protect the Amazon. Moreover, it indicates that, in the Amazon region, both preservation and economic growth can happen simultaneously, contrary to any perceived dichotomy between these two goals.

Our findings show that the policy change had no effect on agricultural production. This finding reinforces the case for relying on monitoring and law enforcement to protect the Amazon.

2. If the policy aims to change economic behavior, it must have more explicit methods of doing this – blacklisting alone does not achieve the goal. Our findings indicate that, if the government wants to change economic behavior, they should promote actions that directly affect the economic variables, as the blacklist policy has been shown to be not effective in changing these variables.