The Increase in Deforestation in the Amazon in 2013: a point off the curve or out of control?

In 2012-2013, the deforestation rate in the Amazon increased significantly by 28% (INPE, 2013), a rate considered unacceptable, given that the government has the essential means for preventing such a result. Although the area deforested in that period (5,843 km^2) is the second lowest recording since the beginning of monitoring by Inpe (1988), that still represents a major waste, given that there is already a large deforested area in the Amazon that is completely underutilized. Embrapa and Inpe estimate that by 2010 the abandoned or underutilized area (covered by degraded pasture or pasture undergoing forest regeneration) in the region totaled approximately 12 million hectares (5.4 times the area of the State of Sergipe). If 25% of that area were appropriately utilized, besides avoiding deforestation, it would already be enough to meet the growing demand for beef up to 2022.

That deforestation, most of it illegal, resulted in the emission of around 253 million tons of CO_2, a volume equivalent to three times the annual emissions (2012) from the transportation sector in Brazil[1].

With the objective of reflecting on the causes that led to this deforestation and stimulating a reaction by the Brazilian Public Sector, the Amazon Institute for Environmental Research (IPAM), the Socioenvironmental Institute (ISA) and the Institute of People and the Environment of the Amazon (IMAZON), present in this document their reflections on the increase in deforestation that occurred in 2013 and put forth a series of recommendations for moving forward with reductions in rates of forest destruction in the Amazon.

Why did deforestation increase in 2013?

The increase in deforestation (Figure 1) coincided with several factors that have traditionally encouraged cutting of forests and affected forests situated in different land title categories (Figure 2). The increase in prices for agricultural products, for example, have historically spurred deforestation for both productive and speculative purposes. One deforests in order to "valorize" land and obtain gains as its price increases in the future. Additionally, major infrastructure works such as hydroelectric projects, paving of highways (BR-163, Transamazon) and construction of ports (Itaituba and Santarém) changes the dynamics in the region and may have contributed in part to the recent increase in felling of forests. In many cases works such as highways and ports attract those seeking to facilitate activities such as transporting agricultural products. However, socioenvironmental safeguards for mitigating the risks of deforestation associated to such major works are weak. Furthermore, there is a lack of pressure of the government and public investments for fulfilling such safeguards. The most emblematic example of this

[1] http://seeg.observatoriodoclima.eco.br/index.php/page/17-Emiss%25C3%25B5es-by-setor

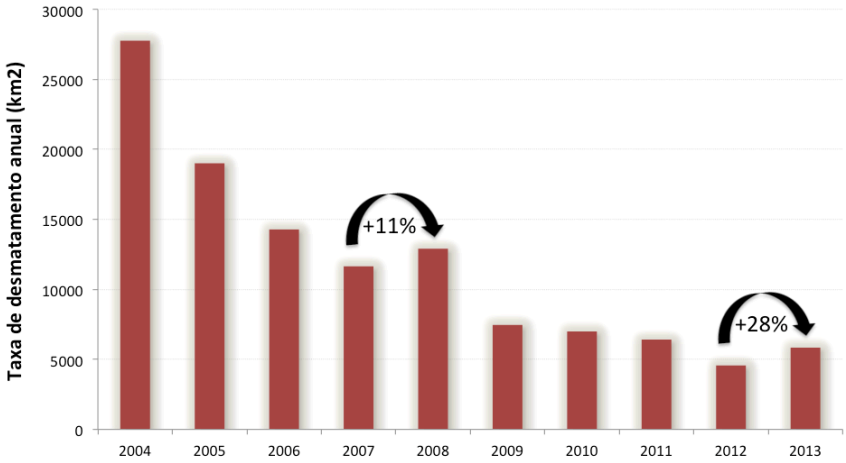

Figure 1. Evolution of the annual deforestation rate in the Amazon. Source: Prodes-Inpe (http://www.obt.inpe.br/prodes/index.php). The arrows indicate the percentage increases in the rates at two moments beginning in 2004: 2007-2008 and 2012-2013.

situation was when the recommendation made by the environmental impact report for the Belo Monte dam for creating approximately 15,000 square kilometers of Conservation Units was not followed. Moreover, work has continued at full steam, even after Ibama pointed out that the construction company responsible for the work has failed to meet several socioenvironmental requirements.

At the same time, the government has been weakening environmental regulations. The new Forest Code approved in 2012 allowed the consolidation of a significant portion of area illegally deforested in the past, which created expectations that new deforestation may be amnestied in the future. The government also reduced Conservation Units (responsible for only 3% of deforestation, although covering 25 % of Brazilian Amazon territory, Figure 2 and Table 1) and the National Congress (PEC 215) is threatening to weaken indigenous rights. Furthermore, the pattern of deforestation suggests that deforestation is increasing in public lands that are not designated for specific purposes and those for which land title information is lacking (Figure 2, Table 1). Around 37% of deforestation occurred in areas included in these two categories (Table 1).

Deforestation in land reform settlement areas has also been high, and is apparently associated with the concentration of land by non-settlers**.** For example, considering only deforestation in settlement areas (29% of the total - Figure 2 and Table1), 75% of deforestation events were greater than 10 hectares, a number inconsistent with the profile of land reform settlers, who deforest two hectares per year on average for subsistence purposes. Additionally, 55 settlements alone (out of more than 2,700) accounted for 50% of deforestation within this land title category.

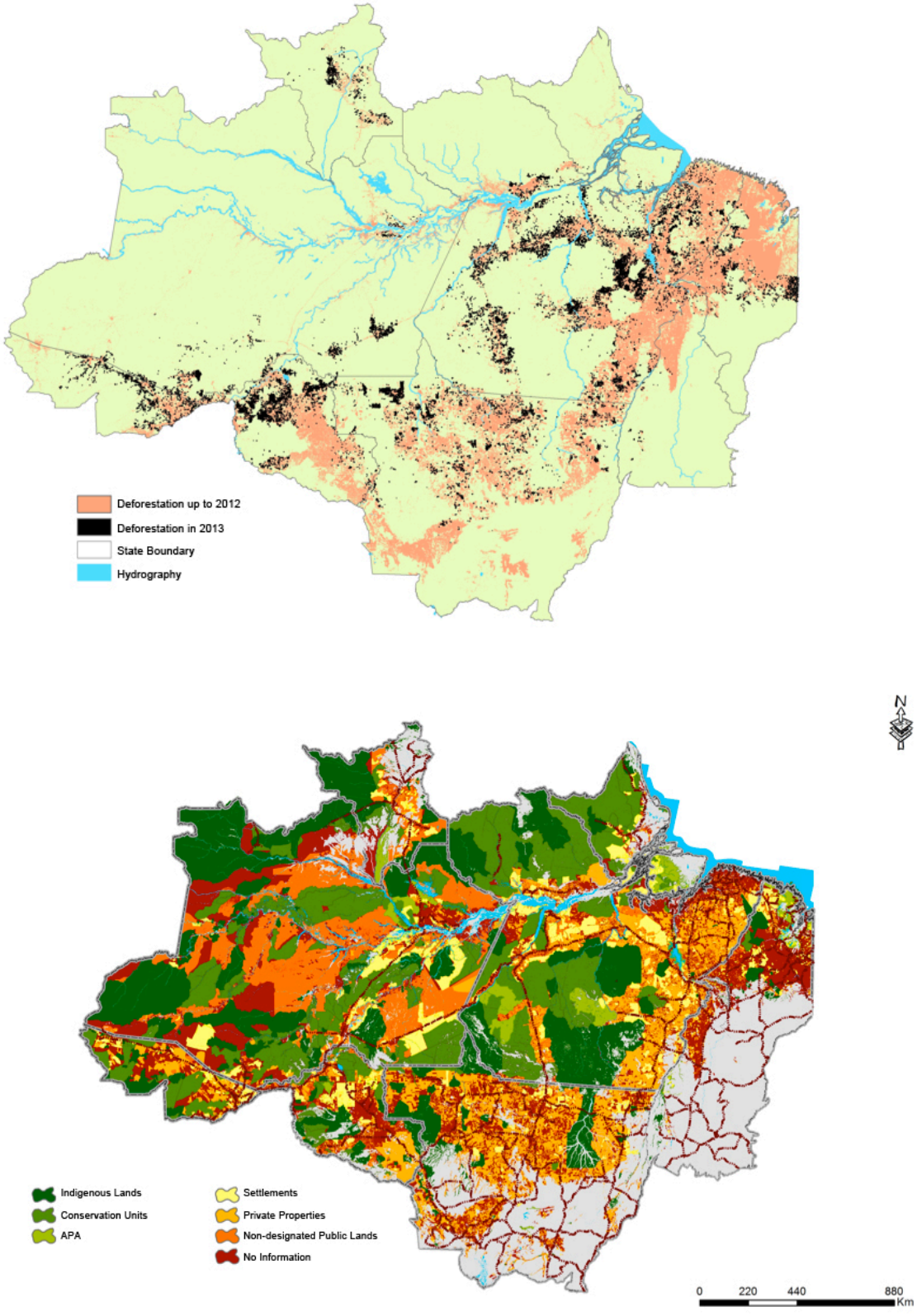

Figure 2. Area deforested in 2013 (upper map, points in black) and distribution of land title categories (lower map) in the Brazilian Amazon. Source: Deforestation - Prodes 2013; Land title categories - see Table 1.

Table 1. Deforestation in 2013 by land title category in the Brazilian Amazon.

Land title category	Area deforested in 2013 (km²)	% of the total deforested
Indigenous Land *	148.04	3
Conservation Unit *	312.18	6
Environmental Protection Area (APA) **	234.01	5
Settlement §	1,399.86	29
Private property ¥	994.02	20
Non-designated public land &	665.20	14
Land lacking land title information #	1,121.45	23
Total	**4,874.76 ‡**	

* Socioenvironmental Institute 2011 – Geographic database; ** Considered separately from the other UCs because it does not present restrictions on use - Socioenvironmental Institute 2011 – Geographical database; § Land Reform settlements - National Institute for Colonization and Agrarian Reform 2013 – Geographic database; ¥ Properties with boundaries identified, recorded or not; & Federal and State Lands with defined boundaries (SFB, 2011); # Group of public and private lands for which there is no land title information available, either because of the lack of a rural registry or lack of allocation by the government; ‡ The total area deforested is different (smaller) than that estimated by (5,843 km²), since accounting of deforestation by land title category in this paper was done only with raw data obtained from shapefile records provided by Prodes/2013, which do not include estimates of the deforested areas that are, for example, under cloud cover.

Lessons for fighting deforestation

In recent years Brazil has learned several lessons on fighting deforestation in the Amazon. For example, beginning in 2005, the rates at which the forest was being felled began to drop gradually as a result of several control measures. Among these were intensification of enforcement (including arrests of those involved in environmental crimes) and creation of Conservation Units[2] (Figure 1). Also contributing to this drop in the rates was the embargo on purchase of soy from areas that had been deforested. However, in 2008 the deforestation rate increased by 11 % (Figure 1). In response, the government rapidly implemented even stronger and more focused measures, among them:

[2] Soares-Filho B., Moutinho P., Nepstad D., Anderson A., Rodrigues H., Garcia R., Dietzsch L., Merry F., Bowman M., Hissa L., Silvestrinia R. and Maretti C. 2010. Role of Brazilian Amazon protected areas in Climate change mitigation. PNAS 107(24): 10821–10826. www.pnas.org/cgi/doi/10.1073/pnas.0913048107.

- concentrated enforcement focused on critical municipalities with the highest rates of deforestation;
- credit restriction for producers who have not begun environmental regularization of their properties;
- embargo of deforested areas and provision of maps of those areas on the internet, making those who buy products obtained from those areas liable for penalties.

Besides these actions by the Executive Branch, the Public Prosecution Service began legal action against companies buying cattle from illegally deforested areas.

Despite the success in deforestation in the Amazon achieved in the last few years, the government and society will need to be alert in order to avoid increases, even episodic ones. The persistence of such deforestation indicates that new measures combatting it need to be implemented. Such measures must act particularly in the area of economic incentives for conservation and reduction of speculative deforestation. After all, the final objective is the complete extinction of deforestation in the region, given that the area being felled at present is still unacceptable in environmental and climatic terms. The forest is a finite resource. To preserve it, it will be necessary to eradicate deforestation as quickly as possible. Thus, in order to continue having consistent reductions in deforestation rates over the next few years, it will be necessary to move forward with already established and proven measures for fighting deforestation and to implement other innovative ones. We present below several alternatives in this regard.

1) Enforce and punish rapidly

It is necessary to rapidly enforce legislation and punish environmental crimes with actions by both the Federal Police and Ibama. Enforcement must be more preventive than reactive. To that end, detection and action in areas degraded by logging must be prioritized as a strategy for anticipating deforestation. It is also necessary to guarantee that embargoed areas will stay embargoed. There is evidence that sale of products derived from these areas is occurring. To this end, it will be necessary to broaden confiscation of the cattle herd raised in embargoed areas and hold meat packing plants liable for buying those cattle. That can be done by crossing the data available on Animal Transportation Forms with information from the list of embargoed areas.

The moratorium on soy and actions by the Public Prosecution Service against illegal beef must be broadened and reinforced. Besides restricting the market for illegal producers, such measures should also reward those who produce in a sustainable manner.

Effective punishment of major illegal deforesters must also be a priority. Considering that to deforest one hectare of forest the cost is approximately R$ 1.5 thousand (information from the field), investigation into the financial movement involved in illegal destruction of the forest may be an innovative control action to be used. A task force made up of Ibama, Federal

Police and State and Federal Public Prosecution Services could hold responsible not only those who directly promote illegal felling of trees, but also those financing such activity.

2) Create economic incentives for conservation

Besides punishing offenders, it is essential to also support conservation. That can be done with immediate economic incentives, at the appropriate scale, for forest conservation, recomposition and forest regularization. Credit for agriculture and ranching activities in the Amazon has grown substantially, without adjustment to the Forest Code, even with all of the weakening involved in the new version of the law, being adopted as an example of a selective criterion for concession of financing.

Some of the incentives are already provided in Article 41 of the new forest law, such as sustainable public purchases, differentiated tax treatment, payment for environmental services, certification and credit for sustainable agriculture, ranching and forest production.

The incentives should be preferentially directed towards family agriculture, according to the new Forest Code, and could reinforcement initiatives such as the Incra Green Settlement Program and the proposal for payment for environmental services via the Food Acquisition Program (PAA).

Incentives could also involve taxation. For example, the government still collects only a fraction of the Rural Land Tax (ITR), which was created to curb speculative occupation and could be used as a resource for encouraging sustainable production. In 2002, the federal administration collected only 6% of the potential amount of ITR according to an analyst with the Federal Revenue system.

3) Combat land speculation

Land speculation or speculative deforestation appears to be one of the main reasons for the advance of deforestation, even if large already deforested areas are already available. Speculation certainly drives illegal deforestation. Felling of forest for undue appropriation ("possession") of public lands represents a historically consolidated stimulus, and is often reinforced by the public authority. Rarely does the government retake possession of those lands, even when they are clearly poorly utilized or nonproductive. In this regard, collecting the ITR is essential for discouraging speculation. This is especially true for municipalities with a concentration of underutilized areas, such as São Félix do Xingu, in Pará, and Aripuanã, in Mato Grosso[3].

[3] See the list of municipalities with the most underutilized lands in Barreto, P. & Silva, D. 2013. Como desenvolver a economia rural sem desmatar a Amazônia? Belém-PA: Imazon.

To avoid speculation the government must also resist pressures for reducing protected areas in the region. A recent study has demonstrated that the protected areas that are least effective against deforestation are those where land title conflicts already exist[4]. That is why it is not surprising that deforestation around the Flonas of Altamira and Jamanxim (Figure 3), as well as the Baú Indigenous Land in the area of influence of the BR-163 highway is associated with the expectation that the dimensions of those protected areas will be reduced. It is therefore necessary to halt the political process for revising those dimensions in Congress and demand less ambiguous signals from the government's congressional base on this issue.

4) Appropriately order and allocate use of territory

Deforestation continues to advance in non-designated public lands. There are millions of hectares of forested lands that are awaiting allocation[5] and are at the mercy of land-grabbers and speculators (Figure 2). The government must coordinate and focus the actions of several agencies responsible for the allocation and management of these territories, such as the Brazilian Forest Service, Ibama, ICMBio, Incra and Funai. Priority must be given for designating lands for conservation and sustainable use by peoples of the forest, who have been suffering pressures, including from new infrastructure works in the region.

In the already occupied areas, the government must accelerate the georeferenced Rural Environmental Registry (CAR) – accompanied by effective monitoring of it – something which is unfortunately still very faulty. For example, it has been reported that squatters in embargoed areas are receiving titles to land in western Pará.

These actions must be concentrated around major infrastructure Works of federal interest, including paving of the BR-163 (responsible for more than 50% of deforestation for 2013), the Transamazon and the area around the Hydroelectric Projects of Madeira and Belo Monte.

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[4] Nolte, C.; Agrawal, A. & Barreto, P. 2013. Setting priorities to avoid deforestation in Amazon protected areas: are we choosing the right indicators? *Environmental Research Letters*. 8 015039

[5] SFB. Brazilian Forest Service/Ipam. Institute for Environmental Research in the Amazon. 2011. Florestas Nativas de Produção Brasileiras. (Relatório). Brasília, DF. Available at: http://ipam.org.br/download/livro/Florestas-Nativas-de-Producao-Brasileiras/612.

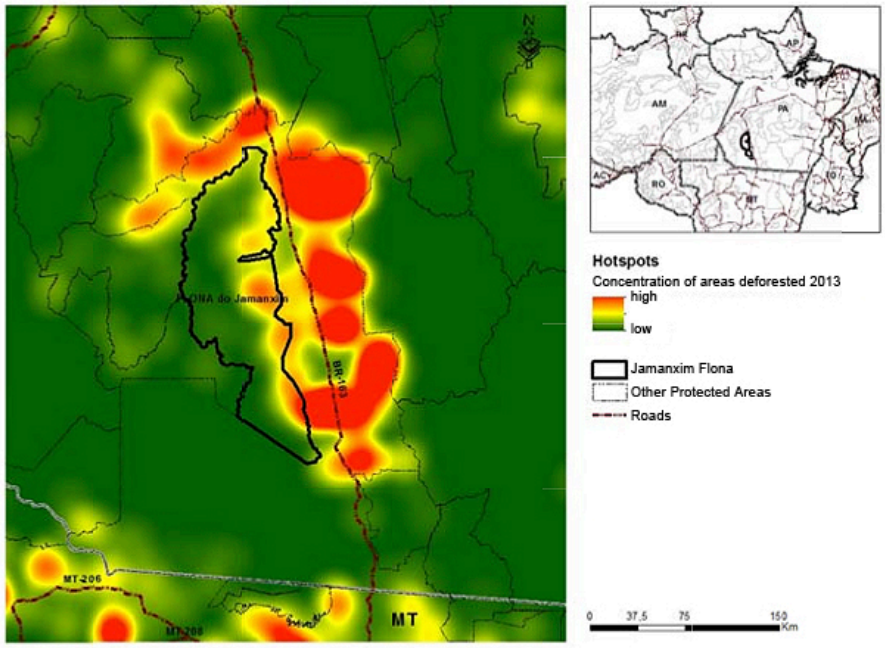

Figure 3. The "hotspots" of deforestation in 2013 in the region of BR-163/Flona do Jamanxim. Each hotspot is delineated using the calculation (Kernel Density Estimation) of the density of deforestation polygons of different sizes occurring throughout 2013.

Finally, recent history demonstrates that fighting deforestation must be taken on as a permanent mission, as is the case with fighting inflation. To that end, it is important to observe and pursue the goals for reducing inflation already established for the region. Considering the volume of lands already deforested and abandoned, this goal must be zero deforestation! With ceaseless and integrated application of policies that have already proven effective against deforestation, added to innovative policies, it would be perfectly possible to achieve such a goal.

In this sense, the institutions listed below offer this brief analysis of the deforestation recorded in 2013 and place themselves at the Government's disposition for an in-depth debate on the results and recommendations briefly presented herein. With a joint effort by society and the public sector, it is hoped that the significant increase of deforestation that has occurred in the Amazon will be only a point off of the curve and not a reversal of the trend towards a drop in forest destruction.

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