Areas for Forest Management in Pará State[1]

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The State of Pará in the Eastern Brazilian Amazon is the largest producer of native timber in Brazil. However, a large part of this production is predatory. To ensure timber production on a managed approach[2], the forest sector needs approximately 225 thousand square kilometers of forest (18% of the State's territory). The potential area for forest management in the State is around 250 thousand square kilometers. However, only slightly more than a half of that area (130 thousand square kilometers) is destined for forest management — either as private community areas or public production forests[3]. Therefore, it is necessary to locate and legally designate at least 120 thousand square kilometers of area for forest management. In response to this demand, the federal and state governments have proposed creating public production forests in Pará. In this *The State of the Amazon*, we estimate the demand and supply of areas for forest management and suggest where new production forests might be created. To guarantee the sustainable use of those forests, we mainly recommend creation of State Forests (Flotas) in areas with low human pressure and Environmental Protection Areas (APAs) in the areas with greater human impact. Additionally, we suggest adoption of legal instruments to limit installation of industries according to the support capacity of the forest management areas.

Pará Timber Zones

Pará has forest with great stocks of timber and strategic localization to national and overseas market. Those factors have contributed to rapid expansion of logging activity in the State. In 2004, roundwood production in Pará reached 11.2 million cubic meters, which represented 46% of Brazilian Amazon production[4]. However this production is irregularly distributed among the State's timber zones. Most timber production (48%) occurs in the eastern zone of the State, where the timber production centers of Paragominas and Tailândia are situated. However, a drastic drop in timber production is imminent in that zone due to deforestation. In the southern portion— an old mahogany frontier during the 1970s and 90s—, roundwood production represents only 6%. In the estuary zone, whose main timber production center is Breves, roundwood production represents 26% of the State's production. In the western zone, production is still low, but is growing, reaching 12% of timber harvested in Pará. On the other hand, roundwood production is incipient in the central zone (influenced by the Transamazon highway), with only 6%, and extremely reduced in the northern zone (the *Calha Norte*), with only 2% (Figure 1 and Table 1).

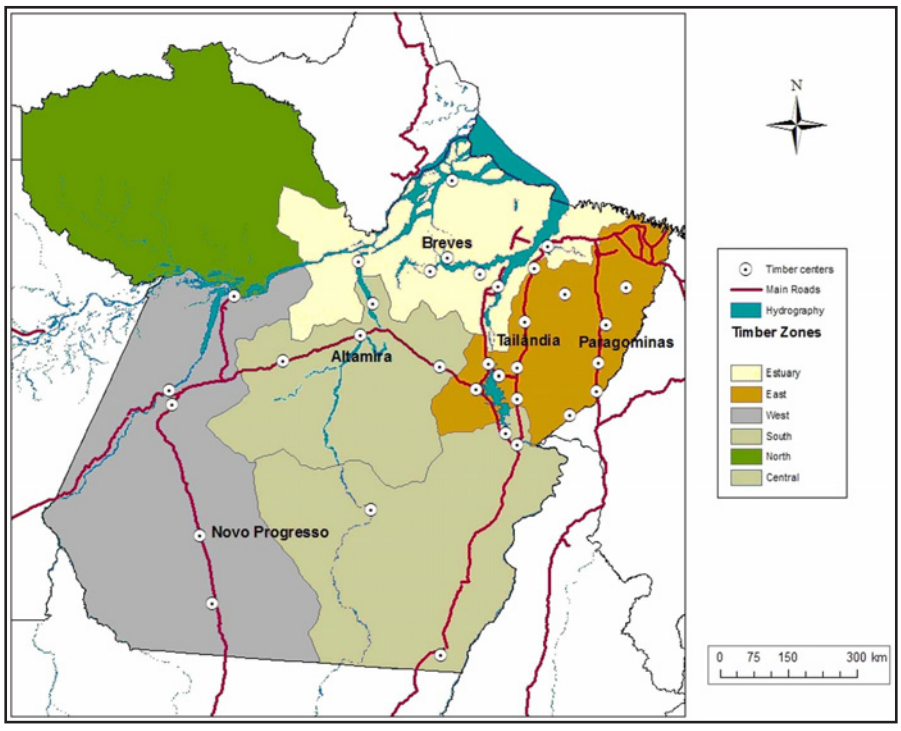

Figure 1. Timber zones in Pará.

Table 1. Roundwood production and demand for forest management in the timber zones of Pará in 2004.

Zones	Production (m³ log)[a]		Demand by Area (km²)[b]
	million m³	%	Growth 1% per year
Central	0.7	6	14.152
Estuary	2.86	26	57.823
East	5.38	48	108.771
West	1.36	12	27.496
South	0.7	6	13.344
North	0.2	2	3.841
Total Pará	**11,2**		**225.428**

[a] Based on timber production for 2004.
[b] Considering a cutting cycle of 30 years and logging intensity of 20 m³/ha. Total area necessary at end of cycle.

Table 2. Area for forest management in Pará.

Zones	Total Forest Area (km²)[a]	Potential Area for Forest Management (km²)[b]
Central	52.457	23,044
Estuary	83.519	59,611
East	34.243	7,533
West	128.099	86,003
South	47.727	6,682
North	86.141	67,190
Total Pará	**432.185**	**250,461**

[a] Areas identified by remote sensing.
[b] Excluding areas with no potential for economic use.

Demand of Areas for Forests Management

The timber industry installed in Pará needs approximately 225 thousand square kilometers (18% of Pará territory) of net forest area[5] on management pattern. This estimative consider an increase in demand for sawnwood of 1% per year in the next 30 years, based on the volume of 11.2 million cubic meters harvested in 2004 (Table 1). In this case, we assume that all the timber consumed by the industry come from forest management areas in a cutting cycle of 30 years, with a logging intensity of 20 cubic meters per hectare and with an industrial yield of 32% to 42%, depending on the timber zone[6].

Supply of Areas for Forests Management

Pará holds extensive forest areas, but most of them are not used for logging or are areas where this activity is prohibited such as Indigenous Lands and Full Protection Conservation Units (Parks, Biological Reserves and Ecological Stations). The total potential forest area for forestry activity in Pará adds up to approximately 432 thousand square kilometers (35% of the State) (Table 2). However, approximately 182 thousand square kilometers of this total are forests with no potential for forest management — for reasons such as low natural occurrence of commercially valuable timber, forests logged in a predatory manner, forests situated in areas with very irregular topography and forests located in Permanent Preservation Areas (APPs). However, the forests with potential for forest management in Pará add up to approximately 250 thousand square kilometers (20% of the State), an amount very close to the area necessary for guaranteeing sustained production in a conservative scenario with growth of 1% in the demand for sawnwood (225 thousand square kilometers).

Balance of Forests for Management in Pará

When we consider the demand for areas for forest management and the supply of potential areas for forest management, the balance is only 25 thousand square kilometers (Figure 2). However, there is a great variation between the timber zones in the State. We estimate a

Figure 2. Balance of forest management area in Pará, considering an increase of 1% per year in sawnwood production.

significant deficit in the east region, as evidenced by a strong reduction in timber activity in that zone. The central and estuary zones are in an intermediate situation (slightly positive balance) as is the southern zone (small deficit). On the other hand, there is a considerably higher positive balance in the west and north of the State, which will bring an ever greater demand for timber from those zones. In fact, a migration of timber companies is taking place, mainly towards the west zone of Pará. The timber deficit projected for the east zone can be mitigated by the supply of timber from plantations which could be used in manufacturing veneers and plywood, as well as timber employed in civil construction. In the same way, improvement in the mechanical processing yield could reduce the demand for forest areas and improve the balance of forests in Pará. On the other hand, the increase in demand for timber on the national and international market may reduce even more the balance of forests in the State and cancel out eventual gains obtained through improvement in yields and reforestation.

Potential Areas for Forest Management in Pará

Potential Forest areas for forest management in Pará (250 thousand square kilometers) may be divided into four categories (Figure 3 and Table 3)[7]. First, there are 83 thousand square kilometers (33%) of forest situated in existing Sustainable Use Conservation Units such as Flonas, APAs and Sustainable Development Reserves (RDS). Second, there are 7 thousand square kilometers (3%) of remain forests in land reform settlements. Third, there are 41 thousand square kilometers (16%) of dispersed forests in the State, such as private, community and unclaimed lands. Lastly, a study carried out by Imazon in 2006, identified the existence of approximately 120 thousand square kilometers (48%) of net potential forests for forest management in the State with no defined use. The Imazon study performed based in the Pará Ecological-Economic Macrozoning (State Law no. 6.745/05). This study recommended those areas exclusively for forest use, both in Sustainable Use Conservation Units (Flotas or Flonas and APAs) and outside of Conservation Units. Based on this study, the Government of Pará began the process of creating (preparing technical studies and holding public consultations) for five Flotas, totaling approximately 84 thousand square kilometers[8], and two APAs, totaling 25 thousand square kilometers[9].

Recommendations for Public Policies

Pará State faces a threshold situation between demand (225 thousand square kilometers) and supply (250 thousand square kilometers) of forest management areas. Additionally, around 120 thousand square kilometers of the forest management area (net supply)

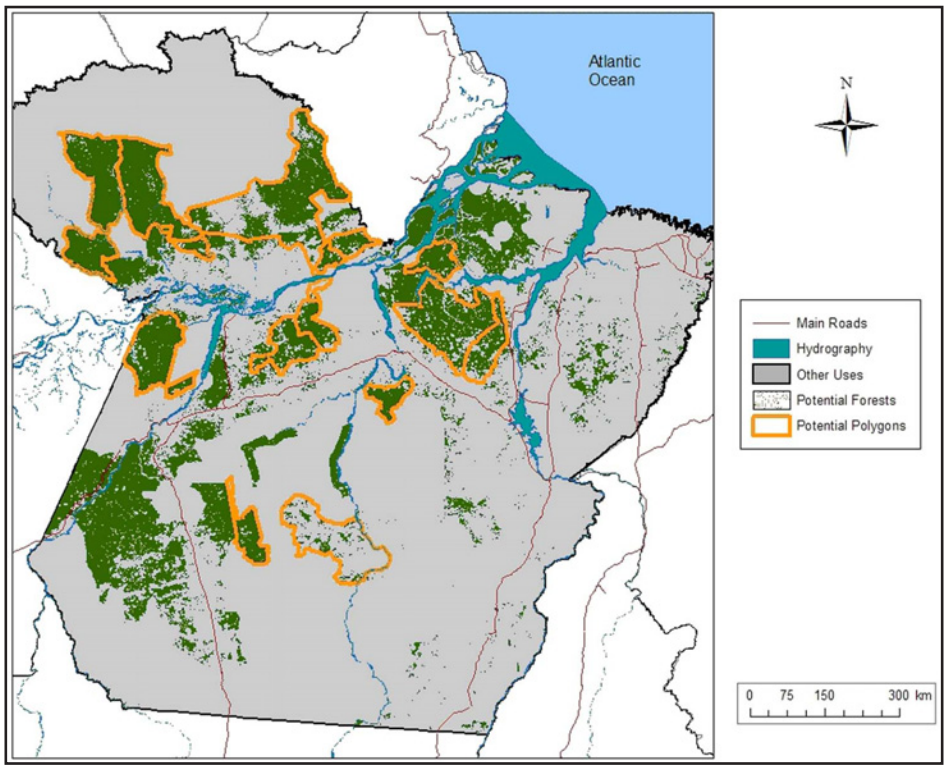

Figure 3. Net forest area for forest management in Pará.

Table 3. Areas for forest management in Pará, 2006.

Categories	Total Forest Area[2] (km²)	Area with Potential for Forest Management (km² and %)[3]	
Flonas	60,863	45,960	(18)
APAs	46,784	35,969	(14)
RDS	1,092	794	(0)
Rural Settlements	28,172	7,208	(3)
Dispersed Forests[1]	129,693	40,582	(16)
Potential Areas	165,581	119,948	(48)
Area total	**432,185**	**250,461**	

[1] Includes private, community and/or unclaimed lands;
[2] Areas with forests identified by remote sensing.
[4] Forest areas with potential for forest management. Excludes areas without commercial value, areas already logged, areas with irregular terrain and areas in APPs.

need to be legally destined for forestry use — both in Sustainable Use Conservation Units (Flotas, APAs, RDS etc.) or as forest concession areas outside of Conservation Units. To this end, it is essential to finalize the process of creating the Flotas (Paru, Trombetas, Faro, Amazônia and Iriri), whose total area will add up to approximately 84 thousand square kilometers. Additionally, it is important to establish APAs in the forest areas that have suffered the most human impact, as well as destine areas for forest concession outside of the Conservation Units. In addition to this we recommend:

More Rigor in Timber Companies Installation. Establish legal mechanisms that will define a maximum quota for roundwood consumption at the sawmills and limit the number of timber industries in Pará State according to the support capacity of the forest management areas. For example, to obtain an installation license, the timber company would have to prove the source of their projected roundwood needs. It is important to also assure negotiation mechanisms to allow a more efficient timber company to acquire a license from a less efficient sawmill. More detailed studies should be carried out to define the most appropriate legal instrument for establishing those mechanisms.

Replicate this Analysis in Other States. Zoning the forest management areas may provide crucial information for forest sector planning in the Brazilian Amazon. It will show the States where there has been a collapse between demand and supply of forest management areas. Also, these studies would be useful to guide the debate about the proportion of forests that can be destined for forest management, as well as what would be the most appropriate way to carry out this management.

References and Notes

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[1] This article summarizes part of the report *Áreas para a Produção Florestal Manejada: Detalhamento do Macrozoneamento Ecológico-Econômico do Estado do Pará* . Belém: Imazon. 2006. 82 p. Available at www.imazon.org.br (Portuguese only). This study had financial support from the Secretariat for Production of the State of Pará Government and the Gordon and Betty Moore Foundation. We would like to thank the collaboration of Denys Pereira and Cíntia Balieiro.

[2] Forest management consists of a 100% forest inventory of commercial trees; planning of roads, log decks and skidder trails; prior cutting of lianas; directed felling of trees and planned skidding. Additionally, the management plan should contain techniques for stimulating regeneration and growth of commercial trees and a defined cutting cycle (25 to 30 years). Source: Amaral, P.; Veríssimo, A.; Barreto, P. & Vidal, AND. 1998. *Floresta Para Sempre: um manual para a produção de madeira na Amazônia*. Belém, Imazon, WWF and Usaid. 137 p.

[3] Refers to a Sustainable Use Conservation Unit in which it is possible to harvest timber on a managed basis for commercial purposes, as National Forests (Flonas), State Forests (Flotas), Sustainable Development Reserves (RDS) and Environmental Protection Areas (APAs).

[4] Lentini, M.; Pereira, D.; Celentano, D. & Pereira, R. 2006. *Fatos florestais da Amazônia 2005*. Belém: Imazon. 138 p. (www.imazon.org.br)

[5] Refers to the forest area to be destined for managed timber harvesting. Areas without commercial value, inaccessible and inside Permanent Preservation Areas (APPs) are excluded.

[6] Average yields for processing (that is, breakdown of logwood for producing sawnwood) in the timber zones are: 39% (central), 38% (estuary), 44% (east), 41% (west), 42% (south) and 32% (north).

[7] Additionally, there are 21 thousand square kilometers of forest in Extractive Reserves (Resexs), which have restrictions for logging. In the Resexs, timber harvesting can occur only on a community basis (low intensity) and under specific conditions defined in the management plan for each unit.

[8] Flotas in thousand square kilometers: Iriri (4, 4), Amazônia (5, 3), Paru (36), Trombetas (32) and Faro (6, 3).

[9] APAs in thousand square kilometers: Triunfo do Xingu (17) and Santa Maria do Uruara (8)