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VOUCHERS FOR RELEASING FORESTRY CREDIT (CLCF) FOR SINOP, MATO GROSSO, BRAZIL

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ABSTRACT: The analysis and information ordering on the forest sector generate data that may assist both strategic decisions making and new public policies development. Thus, the analyze of Vouchers for Releasing Forestry Credit (*Comprovantes de Liberação de Crédito Florestal - CLCF*) is essential, which is currently one of the main tools utilized by Mato Grosso State for control and inspection released areas to legal obtaining the tropical timber, either through Sustainable Forest Management Plans (*Planos de Manejo Florestal Sustentável - PMFS*) or through the Forest Exploration Plans (*Planos de Exploração Florestal - PEF*). The study aimed to evaluate the Authorizations for Forest Exploration (*Autorizações de Exploração Florestal - AUTEX and AEF*) and their respective CLCF concerning PMFS and PEF from 2006 to 2013 at Sinop, Mato Grosso, Brazil. The documents were obtained from the State Department of Environment of Mato Grosso State (S*ecretaria Estadual do Meio Ambiente do Estado de Mato Grosso - SEMA*). We analyzed 20 CLCFs, 4 related to PEF and 16 related to PMFS. The evaluated area totalized 4566.78 hectares, approximately 95% of that intended for management (PMFS) and the remaining, just over 5%, for the deforestation (PEF). The commercial species variety released for exploration was 66 in PMFS and 30 in PEF. The Cambará (*Qualea paraensis*) was the most represented species in CLCF with higher volumetric participation in areas intended for PMFS (21.17%) and for PEF (22.65%).
Keywords: Amazon Forest, Forest Exploration, Forest Management.

COMPROVANTES DE LIBERAÇÃO DE CRÉDITO FLORESTAL (CLCF) PARA O MUNICÍPIO DE SINOP, MATO GROSSO, BRASIL

RESUMO: *A análise e o ordenamento de informações sobre o setor florestal geram dados que podem auxiliar tanto na tomada de decisões estratégicas, quanto na elaboração de novas políticas públicas. Deste modo, torna-se essencial a análise dos Comprovantes de Liberação de Crédito Florestal (CLCF), que é atualmente uma das principais ferramentas utilizadas pelo Estado de Mato Grosso para controle e fiscalização de áreas liberadas para obtenção legal de madeira tropical, seja por meio dos Planos de Manejo Florestal Sustentável (PMFS) ou ainda, por intermédio dos Planos de Exploração Florestal (PEF). O estudo teve por objetivo avaliar as Autorizações de Exploração Florestal (AUTEX e AEF) e seus respectivos CLCF referentes aos PMFS e aos PEF entre os anos de 2006 a 2013 no município de Sinop-MT. Os documentos foram obtidos junto a Secretaria Estadual do Meio Ambiente do Estado de Mato Grosso (SEMA). Foram analisados um total de 20 CLCF, sendo quatro deles referentes à PEF e outros 16 referentes à PMFS. A área avaliada totalizou 4.566,78 hectares, sendo aproximadamente 95% desta destinada ao manejo (PMFS) e o restante, pouco mais de 5%, destinada ao desmate (PEF). A variedade de espécies comerciais liberadas para exploração foi de 66 em PMFS e 30 em PEF. O Cambará (Qualea paraensis) foi à espécie mais representada nos CLCF, com maior participação volumétrica tanto em áreas destinadas aos PMFS (21,17%) quanto em áreas destinadas aos PEF (22,65%).*
Palavras-chave: *Floresta Amazônica, Exploração Florestal, Manejo Florestal.*

1. INTRODUTION

Wood has always attracted large commercial interest, due to its features, as its high mechanical strength (tensile and compressive), good elasticity, low thermal conductivity, low electrical conductivity (when dry), easily cut to required size, among others. Its utilization is extremely diverse, especially the timber industry and the construction sector. Although it is not intensively used as a structural material, as in other countries, the wood in the Brazilian construction is used in many types of applications, such as roof structures, window frames, floors, decorative structures, among others. This use

diversity makes the wood a raw material largely consumed and appreciated. The Brazilian forest sector has significant participation in the Gross National Product – GNP (Produto Interno Bruto – PIB) represented by 3.4% of the National GNP, which is equal to approximately US$ 44.6 billion. It is estimated that the jobs generated by the entire forestry production chain are around 8.6 million, with 4.0 million coming from raw material from native forests (SOCIEDADE BRASILEIRA DE SILVICULTURA - SBS, 2008). Approximately 25.31 million cubic meters of tropical timber logs are processed in the country, and of this total, almost 12 million (48.3%) intended for export, remaining more than half for domestic consumption, which makes the country a world leader in the sector, both in production and consumption (ÂNGELO et al, 2004).

The Amazon region is highlighted as one of the main tropical timber producers in the world. Allied to this, is growing the concern about the sustainability of this ecosystem increasingly targeted and threatened. The fact of being a renewable resource makes the wood an important and competitive material. However, its rise shall not be ignored, since the timber from illegal extraction or poorly developed management ceases to be a versatile raw material, generating income and renewable, to become a villain to the Amazon ecosystem. Many tropical timber processing companies in the Amazon region are small and rudimentary and operate with lower production of 5,000 m³/year. The wooden abundant supply is directly linked to the large number of timber companies in the region. However, some sites have been under increasing difficulties of obtaining raw material, which causes numerous industries cease to operate and migrate to new frontiers, thus featuring an exploratory profile of a significant sector portion (ÂNGELO et al, 2004). In this context, Sinop, located in legal Amazon, is reference center in northern of Mato Grosso due to the practiced economic activities that are basically services provision and, with great emphasis, the agricultural and timber sector. The region native forests present numerous timber species as Itaúba, Amescla, Angelim, Cedro and Cambará, for example. Such features make Sinop a city with large potential for timber extraction of economic interest. This exploitation, legalized, occurs basically in two manners; one is by Sustainable Forest Management Plan (Plano de Manejo Florestal Sustentável - PMFS) which it is a technical document elaborated by forest engineer that provides guidelines and procedures for the timber resources exploration or not, in the legal land of rural property. The PMFS is designed mainly to promote environmental, economic and social benefits respecting the ecosystem support mechanisms.

Another manner is through the Forest Exploration Plan (Plano de Exploração Florestal - PEF) that achieves the same objectives as the PMFS, however occurs in areas of forest cover suppression, i.e., outside the legal reserve. PEF is characterized by culling all trees of commercial interest present in the area that will further be destined to agriculture or livestock. Thus, the forestry exploitation required to be licensed and monitored by the environmental body, which for the study area it is the State Department of the Environment of the Mato Grosso State (Secretaria Estadual do Meio Ambiente do Estado de Mato Grosso - SEMA-MT). These actions incurred in the documents issuance denominated Vouchers for Releasing Forestry Credit (Comprovantes de Liberação de Crédito Florestal - CLCF). Therefore, the document between CLCF and PMFS / PEF is called Authorization for Forest Exploration (AUTEX and AEF acronyms, respectively).

Information ordering on the forest sector generates data that may assist both in strategic decision making (in the technical level), as in the new public policies development (in the political level), as forest management, besides being a technical- scientific activity, is also a political, administrative, management and commercial strategy, which uses principles and forestry techniques, then, the information unavailability and the inconsistency, further complicates this important activity in the Amazon region. Thus, it is essential to analyze the Vouchers for Releasing Forestry Credit (Comprovantes de Liberação de Crédito Florestal - CLCF), which constitute an important mechanism for controlling and monitoring released areas to tropical timber legal exploitation, whether through PMFS or PEF.

2. MATERIALS AND METHODS

2.1. Characterization of Study Area

Located on the Cuiabá highway edges - Santarém (BR-163), at 500 km from Mato Grosso State capital (Cuiabá), between 55°W and 46ºW meridians, Sinop (Figure 1) has 3,942.231 km² area and a population of 113,099 inhabitants, approximately (INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA - IBGE, 2014). It is among the five largest cities in the State and nowadays is the third largest collector of state taxes. The timber industry is a major source of the city resources, jointly with agricultural sector and providing services.

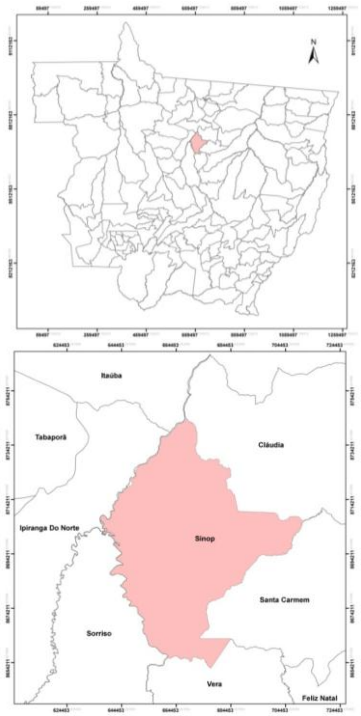

Figure 1. Representative maps of Sinop municipality's disposal within the State of Mato Grosso border municipalities (RIBEIRO, 2011).

2.2. Data Collection

All information utilized in this study was obtained directly from the virtual database of the State Department of Environment (Secretaria Estadual de Meio Ambiente - SEMA-MT) of Mato Grosso State, through the Public Integrated System of Environmental Monitoring and Licensing (Sistema Integrado de Monitoramento e Licenciamento Ambiental – SIMLAM). Data relating to Vouchers for Releasing Forestry Credit (Comprovantes de Liberação de Crédito Florestal - CLCF) issued was utilized to the execution of Sustainable Forest Management Plans (Planos de Manejo Florestal Sustentável - PMFS) and Forest Exploration Plans (Planos de Exploração Florestal - PEF) from 2006 to 2013. Permits issued, exploitable areas, number, diversity and species volume released for exploration were utilized as parameters for each exploration modality mentioned.

2.3. Data analysis

The year 2006 was considered as initial period for data analysis, because it is the landmark of the inspection powers and monitoring transfer in PMFS and PEF of the Brazilian Institute of Environment (Instituto Brasileiro do Meio Ambiente - IBAMA) to SEMA-MT (ROSETTI, 2013). Thus, it was possible to perform a comparison between the different types of CLCF granted by SEMA-MT, i.e. those destined to the PMFS implementation and those who granted release to the PEF. Number of rural real estate, the dimension of areas released for exploration, the species diversity and volume to be exploited in each of these areas were not considered for the analysis.

3. RESULTS AND DISCUSSION

In total, 20 CLCF were issued, 16 related to Sustainable Forest Management Plans (PMFS) and 4 regarding to Forest Exploration Plan (PEF). The areas destined for exploration in all PMFS totalized 4329.66 ha, but for PEF was 237.12 ha (Table 1). The small number of CLCF for PEF suggests that large rural real state of Sinop have 20% of the property already, remaining few areas subject to PEF. The number of commercial species released for exploration was 66 species for PMFS and 30 species for PEF. The difference observed for the species number may be explained by the area dimension released for exploration, being PMFS almost 20 times higher than PEF.

Table 1. Summary of the data obtained.

Modality	CLCF (N°)	Area (ha)	Average Area (ha)	Species of Variety
PMFS	16	4.329,60	270,60	66
PEF	4	237,12	59,28	30
Total	20	4.556,72	-	70

Another reason for PEF present lower species variability is due to the fact that the forest inventory 100% or forestry census is carried out only in PMFS, but the species survey to PEF performing can be carried out by sampling. The species released for exploration in Sinop - MT, from 2006 to 2013, listed in CLCF concerning to PMFS and PEF are in Table 2. We observed 70 species of commercial interest released for exploration, for the evaluated areas. According to Barros; Veríssimo (2002) around 350 wood species are explored for timber purposes throughout the Amazon region, therefore, PMFS and PEF are lacking in Sinop, whereas there is large species diversity with exploration potential, opening possibility to optimize the use of forest resources. However, this is not a new or single fact in Sinop, because Araujo (2002) states that in the Brazilian Amazon there is a low use of timber species and one of the main causes is the constant selective exploration occurring in this region and the technological ignorance around most species.

Thus, the author recommends, as an improvement manner for this scenario, the variability study of tropical timber in order to have more and better utilization of its forest potential.

Any species was present in all PMFS, though some had great participation and were present in 93.75% (15 of 16 PMFS), being them the Cambará, Cedrinho, Cumaru and Itaúba, which also had the highest volumetric (Table 3). The Amescla de cheiro, Angico branco, Bálsamo and twenty species appear only once in PMFS, representing 6.25% of participation. These results are similar to Machado (2008) studies who states that some Amazon region species have small populations and are sensitive to any changes in their habitat. According to the same author, some Amazon region species are non-widely distributed, appearing restricted in their distribution.

This feature may also explain the Vermelhinho (*Eugenia* sp.) behavior that had the 7th largest volumetric in PEF (4.94%), but only occurred in one of them.

Figures 2 and 3 show the main species distribution observed in PMFS and PEF, respectively. Although there is a large diversity of species with timber potential in the Amazon region, most of the volume explored in the city is represented by a few forest species. In PMFS only seven species represent 61.67% of the total volume of the wood found and the other 59 sum jointly only 38.33% of the exploitable volume (Figure 2). But in areas submitted to PEF, seven species sum jointly 75.57% and the remaining 23 species were approximately 24% (Figure 3).

In a study conducted by Lopes (2010), among other results, it was observed that seven species most exploited in volumetric percentage in Mato Grosso State, from 2006 to 2010, represented 58.89% of the total volume, were: Cedrinho (17.58%); Cambará (14.46%); Angelim (7.74%); Amescla (6.39%); Itaúba (5.88%); Angelim Pedra (3.5%); and Jatobá (3.34%). In comparison with the present study, Cedrinho, Camabará, Amescla and Itaúba were also the most exploited in volumetric terms.

The Cambará (*Qualea paraensis*) was the species with higher volumetric participation in both PMFS (21.17%) and PEF (22.65%) areas. The Mato Grosso State is characterized by the large occurrence of this species (SOUZA et al, 1997) extending along Northern Brazil mainly in high floodplain and upland forests in Amazonas, Pará, Acre, Rondônia and Mato Grosso States (BIASI, 2005).

Table 2. Commercial species released for exploration in PMFS and PEF area at Sinop-MT (2006 a 2013).

N°	Name	Scientific name	PMFS	PEF
1	Amarelinho	*Bagassa guianensis*	X	
2	Amescla	*Trattinickia burseraefolia*	X	X
3	Amescla-de-cheiro	*Protium heptaphyllum*	X	
4	Amesclão	*Trattinnickia rhoifolia*		X
5	Angelim	*Vatairea sp.*	X	X
6	Angelim-doce	*Pithecellobium sp.*	X	
7	Angelim-pedra	*Hymenolobium modestum*	X	X
8	Angelim-saia	*Parkia sp.*	X	X
9	Angico-branco	*Albizia niopoides*	X	
10	Bálsamo	*Copaifera langsdorffii*	X	
11	Barriguda	*Bombax sp.*	X	
12	Breu-curuba	*Trattinickia sp.*	X	
13	Cajueiro	*Anacardium sp.*	X	
14	Camará	*Vochysia divergens*	X	
15	Cambará	*Qualea paraensis*	X	X
16	Cambará-rosa	*Vochysia sp.*	X	
17	Canela	*Ocotea corymbosa*	X	X
18	Canela-amarela	*Ocotea velutina*	X	
19	Canelão	*Ocotea sp.*	X	
20	Caroba	*Jacaranda copaia*	X	X
21	Carobão	*Jacaranda macrantha*	X	
22	Catanudo	*Micropholis sp.*	X	X
23	Cedrinho	*Erisma uncinatum*	X	X
24	Cedro	*Cedrela sp.*	X	
25	Cedro-do-amazonas	*Cedrela odorata*	X	
26	Cedro-marinheiro	*Guarea sp.*	X	
27	Copaíba	*Copaifera multijuga* Hayne	X	X
28	Cumaru	*Dipteryx odorata (Aubl.) Wild*	X	X
29	Cupiúba	*Goupia glabra* Aubl.	X	X
30	Embira-cheirosa	*Sterculia sp.*	X	
31	Farinha-seca	*Lindackeria paraensis* Kuhlm.	X	
32	Faveiro	*Dinizia excelsa* Ducke	X	
33	Figueira	*Ficus sp.*	X	
34	Garapeira	*Apuleia leiocarpa*	X	X
35	Guanandi	*Calophylum brasiliensis* Cambess.	X	X
36	Guarantã	*Esenbeckiasp.*	X	X
37	Guaritá	*Astroniumsp.*	X	
38	Ingá	*Ingasp.*	X	X
39	Ipê	*Tabebuia sp.*	X	
40	Itaúba	*Mezilaurus itauba*	X	
41	Jatobá	*Hymenaea coubaril*	X	X
42	Leiteiro	*Brosimum lactescens*	X	X
43	Louro-preto	*Nectandra cuspidata*		X
44	Louro-rajado	*Cordia gerascanthus*	X	
45	Maçaranduba	*Manilkara sp.*	X	
46	Mandiocão	*Didymopanax macrocarpum*	X	
47	Marfim	*Chrysophyllum sp.*	X	
48	Marmelada	*Amaioua sp.*	X	
49	Marupá	*Simarouba amara*	X	
50	Mirindiba	*Buchenavia sp.*	X	X
51	Morcegueira	*Trattinnickia lawrencei*	X	X
52	Paineira	*Chorisia speciosa*	X	
53	Pariri	*Pouteria sp.*	X	
54	Pata-de-vaca	*Bauhinia sp.*		X
55	Pente-de-macaco	*Apeiba echinata*	X	X
56	Peroba-cascuda	*Aspidosperma sp.*	X	
57	Peroba-mica	*Aspidosperma polyneuron*	X	X
58	Rosinha	*Vochysia rufescens*	X	X
59	Roxinho	*Peltogyne sp.*	X	
60	Sorveira	*Couma sp.*	X	
61	Sucupira	*Bowdichia racemosa*	X	X
62	Sucupira-amarela	*Enterolobium schomburgkii*	X	
63	Sucupira-branca	*Pterodon pubescens*	X	
64	Sucupirana	*Ferreirea spectabilis*	X	
65	Sucupira-preta	*Diplotropis sp.*	X	
66	Sumauma	*Ceiba pentandra*	X	
67	Tachi	*Sclerolobium sp.*	X	
68	Tamboril	*Enterolobium contortisiliquum*	X	
69	Tauari	*Couratari sp.*	X	
70	Vermelhinho	*Eugenia sp.*		X

Table 3. Occurrence (%) e volume (m³) of the species in PMFS and PEF.

Specie	Occurence (%)		Volume (m³)	
	PMSF	PEF	PMFS	PEF
Amarelinho	18,75	_	395,35	_
Amescla	81,25	75	10.035,99	1.316,65
Amescla-de-cheiro	6,25	_	1.276,64	_
Amesclão	_	25	_	16,70
Angelim	12,50	25	231,27	131,83
Angelim-doce	12,50	_	66,90	_
Angelim-pedra	81,25	75	1.995,44	207,00
Angelim-saia	62,50	25	1.784,93	165,73
Angico-branco	6,25	_	67,86	_
Bálsamo	6,25	_	399,02	_
Barriguda	18,75	_	178,10	_
Breu-curuba	6,25	_	258,64	_
Cajueiro	12,50	_	45,85	_
Camará	6,25	_	1.821,07	_
Cambará	93,75	50	22.428,69	2.804,63
Cambará-rosa	37,50	_	407,10	_
Canela	25,00	75	689,37	130,37
Canela-amarela	6,25	_	350,23	_
Canelão	62,50	_	2.202,44	_
Caroba	81,25	100	1.067,84	102,22
Carobão	6,25	_	51,92	_
Catanudo	43,75	25	4.063,98	54,01
Cedrinho	93,75	100	12.735,78	1.109,45
Cedro	6,25	_	113,14	_
Cedro-do-amazonas	6,25	_	1.369,07	_
Cedro-marinheiro	6,25	_	353,73	_
Copaíba	50,00	75	957,97	37,72
Cumaru	93,75	25	3.355,66	723,46
Cupiúba	62,50	50	4.056,21	665,58
Embira-cheirosa	31,25	_	239,54	_
Farinha-seca	56,25	_	1.185,06	_
Faveiro	6,25	25	128,29	36,26
Figueira	18,75	_	313,32	_
Garapeira	87,50	25	6.995,90	529,95
Guanandi	62,50	25	722,06	134,64
Guarantã	18,75	75	769,51	104,31
Guaritá	12,50	_	66,27	_
Ingá	18,75	50	186,44	124,37
Ipê	25,00	_	106,77	_
Itaúba	93,75	50	5.001,35	2.126,77
Jatobá	56,25	25	878,78	168,01
Leiteiro	25,00	25	1.214,24	290,89
Louro-preto	_	25	_	41,69
Louro-rajado	6,25	_	86,70	_
Maçaranduba	12,50	_	129,28	_
Mandiocão	6,25	_	66,88	_
Marfim	6,25	_	11,33	_
Marmelada	6,25	_	198,38	_
Marupá	12,50	_	58,64	_
Mirindiba	31,25	25	791,28	442,36
Morcegueira	6,25	25	2.262,79	45,46
Paineira	18,75	_	163,90	_
Pariri	6,25	_	380,06	_
Pata-de-vaca	_	25	_	49,65
Pente-de-macaco	56,25	25	2.780,98	114,92
Peroba-cascuda	6,25	_	221,22	_
Peroba-mica	50,00	25	2.038,75	13,08
Rosinha	6,25	50	46,77	10,70
Roxinho	25,00	_	373,64	_
Sorveira	6,25	_	413,03	_
Sucupira	25,00	50	215,74	73,86
Sucupira-amarela	31,25	_	739,24	_
Sucupira-branca	6,25	_	126,08	_
Sucupirana	6,25	_	126,58	_
Sucupira-preta	31,25	_	757,20	_
Sumauma	12,50	_	92,64	_
Tachi	50,00	_	2.889,84	_
Tamboril	6,25	_	78,45	_
Tauari	6,25	_	305,43	_
Vermelhinho	_	25	_	612,17

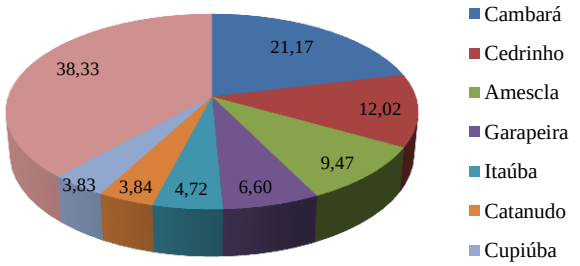

Figure 2. Volumetric percentage of the commercial species in PMFS.

According to Rosetti (2013), in general, the variety of forest species exploited in a region reflects a historical context, which may be justified in terms of factors as: purchase and sale agreement of timber, market requirements, as well as wooden stock of natural tropical forest. The species of lower commercial value, in most of the cases, are not meant to exploitation, since the PMFS and PEF directs its inventory in accordance with the selling future interests of forest amount. For this reason most of the species that represented the largest volumetric in PMFS and PEF are species of high commercial value (Figure 3).

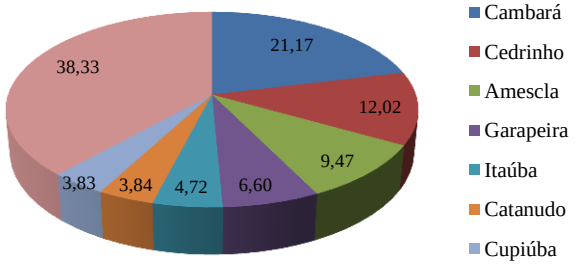

Figure 2. Volumetric percentage of the commercial species in PEF.

The commercial species variability of each CLCF is shown in (Figure 4). This variation does not reflect the forest diversity present in a certain area, because is presented only the species listed as of commercial interest at the plan preparation moment, whether it is PMFS or PEF, and mainly, which are of commercial interest of that owner in question.

This occurs because some plans holders prefer to trade some lower commercial value species even with lower profitability, while others have non-interest. There are some reasons leading to this lack of interest in forest total utilization potential of an area, for example, some properties are more distant from the center of timber industries and the infrastructure precariousness as roads in bad conditions. These factors end up burdening the transport and consequently some species are no longer economically viable to its trading.

It may be observed in this study that the identified species were those that had a circumference at breast height (CBH) large than 94 cm, in accordance with legislation.

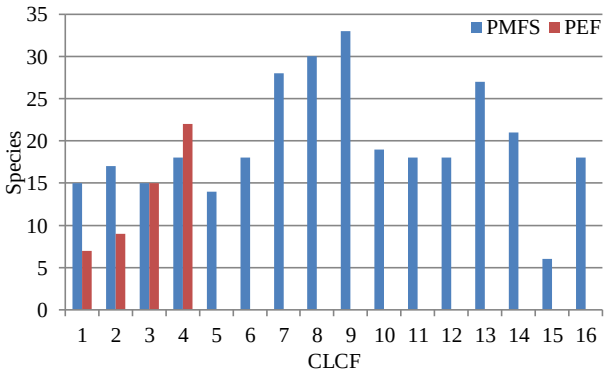

Figure 4. Variability of commercial species in each PMFS and PEF.

The PMFS and PEF contain other species in categories that not appear in CLCF because they are non-trade. In PMFS, the trees that does not appear in CLCF, are the species prohibited of cut (protected by law), the seed holder (responsible for the species existence), the remaining trees (below 50 cm of DBH), those who non-plenty to be sufficient for cutting, and also species not included due to owner area request. The species inclusion with high economic value occur most often adjusting to the demand of buyer market seeking large profitability. As for the PEF, species may be not listed by non-express exploitable character.

The commercial species variability authorized for exploitation (Figure 5) was less than one species per hectare, an extremely low number compared to what was observed by Souza (1997) who states that plants diversity producing wood in the Amazon may reach 300 species per hectare. This information allowed inferring that species exploited for trading is well below to the forest potential, besides the species existence that have non-timber potential known.

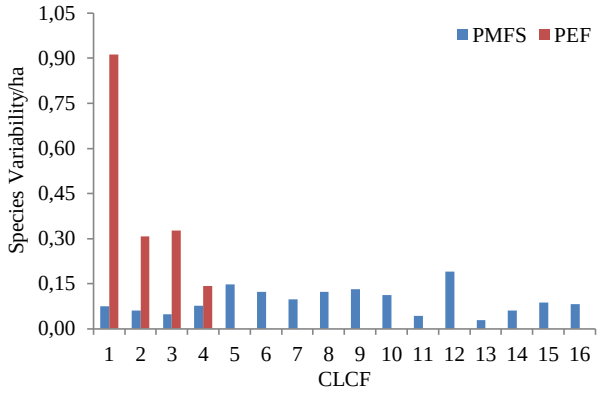

Figura 5. Variability per hectare of commercial species in each PMFS and PEF.

In addition, Araújo (2002) explains that in case of Amazon forest potential, the forest heterogeneity is responsible for the immense species diversity occurring in the region reaffirming the importance of the forest hold great species variety per hectare, since this richness enables an appropriate species grouping for the diverse categories and its end uses.

Thus, the larger species variability per hectare present in PEF when compared to PMFS is explained by comparing the areas size being PEF significantly lower

than those of PMFS (Table 4). The total CLCF analyzed regarding to PMFS and PEF were 16 and 4, respectively, from 2006 to 2013, whereas the PMFS had issued in all years covering the analyzed period, and PEF had issued in 2008, 2010 and 2012. From 2006 to 2009 there was a significant increase in the CLCF emissions regarding to PMFS (Figure 6), being 2009 with the highest emission (5 licenses). However, from 2009 to 2010 there was a decrease of CLCF concerning to PMFS issued, which can be explained by the involvement of the city in repressive operations against environmental crimes.

Table 4. Area for each CLCF studied.

Number	Area (ha)	
	PMFS	PEF
1	203,0309	7,6743
2	283,1545	29,3000
3	313,8705	46,0214
4	235,2986	154,1239
5	95,1863	-
6	146,9300	-
7	286,7870	-
8	243,8599	-
9	250,5630	-
10	169,3702	-
11	419,1455	-
12	95,1310	-
13	950,0317	-
14	349,9318	-
15	68,8886	-
16	217,8032	-

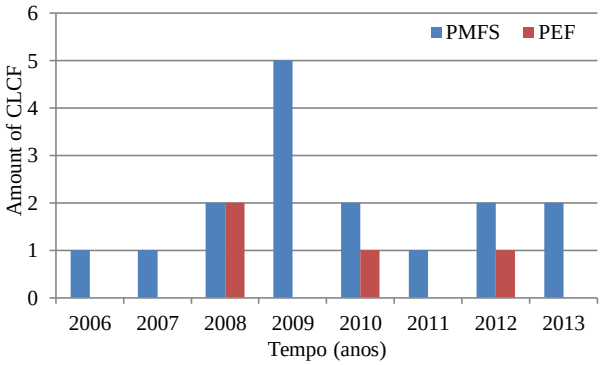

Figure 6. Amount of CLCF between the years 2006 to 2013 at Sinop-MT.

The significant reduction in the PMFS number observed from 2010 may also be a result of strong global financial and economic crisis, which began in the United States in 2008. As a result of this crisis, Mato Grosso State presented a decrease of 50% in sales volume in the first quarter of 2008 resulting in the closure of many companies working exclusively with export. The demand for wood products was affected and had reduced its economic activities, especially investments in construction. As a result, orders and sales of products were reduced and prices of wood products decreased (RIBEIRO et al, 2011). As there is slowness in environmental body to release projects, CLCF released in 2010 were registered a year or two earlier, therefore the crisis occurring in 2008 was evident only in the following years.

In Figure 7, we observe the volume released for exploration in each CLCF (not shelled volume of commercial species). The not shelled volume species was considered as volume found in forest inventory decreased of 10%. This value was standardized to restrict a volumetric intensity to be authorized per hectare, which over the years was being suppressed in cases of PMFS. In PEF there is non-restriction volumetric intensity to be explored. The amount found in the area may be removed, regardless of its value. This fact may be observed for PEF number 4, which presented a volumetric higher than 60 m³/ha per hectare.

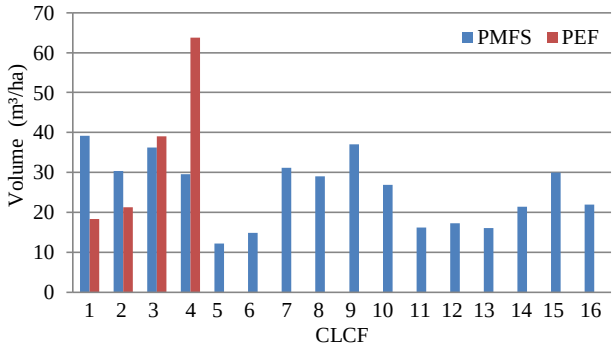

Figure 7. Volumetric released for exploration (m³/ha) in each CLCF.

The volumetric released for exploration in PMFS is always below 40 m³/ha. The exploration intensity for PMFS is up to 30 m³/ha and may be changed based on technical studies properly analyzed and approved by the Technical of Forest Management (Decree Nº. 2152, of February 12, 2014). In some cases when the volume exceeded 30 m³/ha allowed by law, for possibly been presented to the responsible body the proper technical study to prove that the area besides having a large volumetric, supports exploitation above the allowed volume. The CLCF concerning to PEF presented areas considerably smaller than those relating to PMFS (Figure 8). This result is due to the fact that PEF was carried out in smaller areas of the properties, corresponding to 20% which may be destined for alternative land use. According to Law nº 12651, of May 25, 2012, all rural real estate located in the Amazon Forest, which has vegetation with forest phytophysiognomy, shall keep area with native vegetation cover, as a Legal Reserve (RL). This RL must have 80% of the total area (in Amazon Forest case), and this is where the practice of forest management is applied. The remaining 20% of the area may be joined to RL and perform the management in 100% of the area or may be converted, by law, to alternative land use, since there is a project approved by SEMA.

Although Sinop has 142,436.03 hectares of native forest (44.85% of its total area) (RIBEIRO, 2011) and possibly, most of these lands are suitable for forest management practice, it is observed that the PMFS areas carried out annually (around 541.20 ha) is still small when compared to the potential for the development of this activity. Rosetti (2013) after performing research study in the timber industry of Sinop concludes that there are diverse reasons for dissatisfaction and little interest of local entrepreneurs to invest in PMFS in the city. Among

these, the author highlighted the following: the delay in approval the plan; analysis and approval time of PMFS (bureaucracy); the excessive burden (high cost of management); the uncertainty of the application possibility to be denied or delayed by the authorities; the absence of clear and lasting standards; the low-skilled personnel; the little investment in forest development; the lack of incentives as duty-free, among other factors.

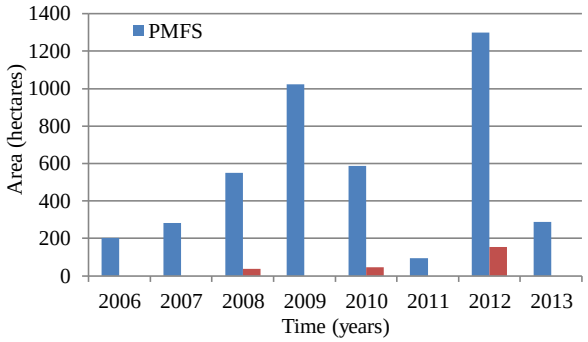

Figure 8. Total area cleared for logging at Sinop between the years 2006-2013.

However, the main obstacles to forest management are the high costs of its implementation in relation to the profits of most of the timber-man, and especially the lack of basic and applied scientific research to assure the regeneration of tree species removed by selective cutting. Public policies have not prioritized scientific studies aimed at supporting the exploitation of the vast Amazon resources (GARRIDO FILHA, 2002).

According to Ribeiro (2013), in 2009, Mato Grosso State had an area of 2.3 million hectares authorized for forest management action. Of these, only 135 hectares are being exploited annually. In 2009, the existing timber areas in the State housed 20 timber poles according to study performed by Pereira et al (2010). It is possible to stipulate with this, an average of 115,000.00 ha of released areas for exploration and 6,750.00 ha of explored areas through PMFS in each State pole. Even Sinop with 2009 as the second year with the largest area released for exploitation, presented only 1,023.00 ha of released areas that year, a number still below the overall average in the state. Another major obstacle to exploitation forestry is because the exploratory activity is the most costly within the management phases (TIMOFEICZYK JUNIOR et al, 2005).

4. CONCLUSIONS

Despite the large species diversity present in the Amazon region, the most part of the exploited volume at Sinop for both Sustainable Forest Management Plans (PMFS) and Forestry Exploration Plans (PEF) is represented by a few forest species, which suggests that forest resources need to be better utilized. The Cambará (*Qualea paraensis*) was the species with the highest volumetric participation for the two forestry exploration modality. Most of the wood exploited in Sinop is from areas submitted to PMFS. Both area released for exploration, as the issued number of Forestry Credit Release Vouchers (CLCF), were much higher for areas submitted to PMFS than those relating to the PEF, since Sinop has most part of its territory with areas already consolidated. Most rural proprieties deforested the portion to which it is entitled, i.e. 20% of the rural property, remaining then few areas susceptible to PEF.

The volumetry explored in 8 years is still very small compared to the large city potential in forestry industrialization, which suggests that much of the wood processed in the Sinop industrial pole comes from other neighboring cities. Although Sinop still has almost half of its area preserved (native forest), only 4,329.60 ha were submitted to PMFS practices in 8 years. This fact may be mainly explained by the high transport costs; the lack of research and technical information; the lack of credit facilities; the gap between productive activities and regulatory official bodies; the forestry sector slowness; the high costs in conducting PMFS; the bureaucracy in licensing phase; the delay of the plan approval ; the analysis and approval time of PMFS; the burden (high cost of management); the uncertainty from the possibility that the application be denied or delayed by the authorities; the lack of clear and lasting standards; the low-skilled personnel; the little investment in forest development; the lack of incentives as duty-free; and finally the time consuming financial return. Thus, the improvement of public policies in the sector is essential, so that the forest potential of the Sinop and of Mato Grosso State, are better used.

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