ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 09, Issue, 07, pp. 29034-29039, July, 2019

RESEARCH ARTICLE OPEN ACCESS

PARAGOMINAS: FROM DEFORESTED CITY TO A MODEL OF SUSTAINABILITY IN THE AMAZON

***Erika Repolho Duarte[1], Victoria Miranda Machado[1], Glauce Vitor da Silva[2], Francisco Igo Leite Soares[2] and Aline Vitor da Silva de Almeida**

[1]Administration Student in the Alenquer University Campus, Federal University of the West of Pará, Alenquer-PA, Brazil

[2]Teacher in Alenquer University Campus, Federal University of the West of Pará, Alenquer-PA, Brazil

ARTICLE INFO

Article History:

Received 13th April, 2019
Received in revised form
06th May, 2019
Accepted 17th June, 2019
Published online 31st July, 2019

Key Words:

Deforestation, Forest Management, Green Municipalities, Sustainable Development.

ABSTRACT

Migration and the creation of highways directly interfered with the deforestation of the Amazon, which resulted in the expansion of agriculture and cattle raising, which is the region's largest source of economy. In fact, in 2008, Paragominas was named by the Ministry of the Environment as one of the most deforested cities. Thus, a city council met to create a Zero Deforestation Pact, which is in the creation and implementation of the Green Municipalities Program. Soon, the municipality was the pioneer to get off the dirty list of deforestation. Thus, a new phase, aid to public policies for socio-environmental development, began with the new practices of management of the local economy through forest management. The reforestation process was carried out with species native to the Amazon region such as cedar, mahogany, maçaranduba, paricá and eucalyptus (non native). The study was based on the bibliographical literature, gathering the subjects related to a thematic approach. In the discussion, observed the negative effects on the GCP result, on the economy, on the local political process, on reforestation with action and on eucalyptus and on the example and sustainability model. In order to achieve the reforestation project was driven by the most successful results due to deforestation, it was also the result of the participation of other organizations that resulted in non-success of the project, proving to be a balanced, environmental and socioeconomic project, resulting in the emergence of new scenarios of economic competitiveness, impact on local politics, promotion of the state of Pará and other services in the same situation of the program in Paragominas.

Citation: Erika Repolho Duarte *et al.* 2019. "Paragominas: from deforested city to a model of sustainability in the amazon", *International Journal of Development Research*, 09, (07), 29034-29039.

INTRODUCTION

The changes that occurred after the Industrial Revolution had an impact on the actions and interaction of man and the environment, but the results of these changes have received worrying attention since the middle of the last century (Zacarias and Higuchi 2017), as soon as natural resources are exhaustive sources, generating warnings about how they are used and the need to achieve equilibrium for the survival of the planet (Borges 2007). There are provisions in Law no. 12.727 / 2012 in the Brazilian Forest Code for the preservation of vegetation, soil and Legal Reserve areas, forest exploitation and control of the use of natural resources, although Brazil is committed to preserve nature and affirm the importance of agriculture and activities that manipulate vegetation for the economy and well-being of the Brazilian population. The Pará state government has the main programs focused on deforestation, the Green Municipalities Program and the Pará 2030 Program, which aim to promote environmental management and sustainable development (Diederichsen *et al*. 2017). The creation of highways built in the region that are intended to assist in the development and integration of other regions are responsible for deforestation in the Amazon, where rural owners used agricultural and livestock practices, contributing to the advancement of deforestation (Carvalho *et al*. 2016) and even with this economic environment, the result of regional development remains below the national average and expected (Moura *et al*, 2017). One of the challenges is the balance between activities and activities as a preconception of the environment, such as an agriculture and cattle ranch, one of the foundations of the Brazilian economy, a service that

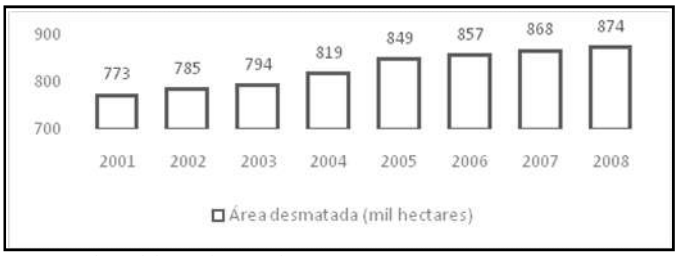
***Corresponding author: Erika Repolho Duarte,**
Administration Student in the Alenquer University Campus, Federal University of the West of Pará, Alenquer-PA, Brazil

requires a large percentage of pasture and discussions about the use of natural resources. At the United Nations Conference on Sustainable Development, Rio + 20, held in Brazil in June 2012, the importance of ensuring the right of all sectors of healthy food to support rural production was highlighted (Sambuichi *et al*., 2012), making it visible to economic development. Paragominas was on the list of the most deforested cities of the Legal Amazon, with imminent effects on the environment and the economy, as well as limits on credit for rural producers, a sector that is among the main economic sources, making essential partnerships among producers to change this scenario (Carneiro and Assis 2015).

This research aimed to present how Paragominas ceased to be a municipality with a high rate of deforestation for an example of environmental recovery and sustainability in the Amazon, its repercussions on the local economy and society, as well as the influence on policies in other cities for adopting sustainable activities.

Paragominas: Paragominas had its foundation different from other cities of Pará, since it was a planned city, while others suffered influence and Portuguese colonization. Its founder, the miner CélioResende de Miranda, in 1958 had obtained support and interest from President JuscelinoKubitschek (1956-1961 mandate) on the projects he had for a possible future city, with the cornerstone of the future municipality being placed in 1961, as reported on the website of the Paragominas City Hall. Célio Miranda's desire was to create a city with potential for growth and development in the Amazon through the Paragominas Plan, a plan for a perfect and more organized city in Brazil. In his death, in 1966, at the age of 46, however, one of his idealizations, preservation of 500 to 600 meters of strip of forested area around the municipality in order to improve the situation of the air and the climate, was fulfilled (Callou 2017). The opening of the BR-010 highway, known as Belém-Brasilia, benefited the municipality and people from other cities and states, culminating in population growth and economic activity, and an influence of migrants is present in the name of Paragominas. The factories are involved in the project (Pará, Goiás and Minas Gerais). During the first years, cattle raising was the focus, gaining strength because of BR-010, and agricultural activity was secondary, after logging took space of the 80's (Callou 2017). The economic source of the municipality comes from livestock, logging, coal, agriculture and bauxite mining (Santos *et al*. 2017).

Economic Development and Deforestation: Territorial occupation in the Amazon was encouraged during the period of the Military Dictatorship (1964-1985), since the military had an interest in the region, based on strategies to expand agriculture, tax incentives, construction of hydroelectric and highways and logging for of the National Integration Plan (NIP), a way of occupying "empty spaces". Paragominas was benefited by the BR-010, an important highway in the Amazon, and by public policies between the 60s and 80s, through incentive credit offers (PINTO *et al*, 2009). According to a study by the Institute of Man and the Environment in the 1990s, Paragominas was the largest timber producer in Brazil and in 2007, produced 653 thousand cubic meters of wood (Pinto *et al*, 2009). In addition to soybeans, Paragominas is a reference in cattle herds, since in mid-2007, the municipality had 419,430 head of cattle, being the sixth largest herd in the state (Pinto *et al* 2009), in 2010 it enjoyed 1.79% of participation in the Pará herd, reinforcing that this activity is also one of the main causes of deforestation (Castelo and Almeida 2015).In 58% of the area of the municipality with bauxite, 14% of aluminum, 0.7% of kaolin and 0.5% of silver and potential for mining, with a company Vale buying 20,000 hectares to extract and implant the enterprise in Paragominas in 2007, with a production capacity of 5.4 million tons per year (Pinto *et al*. 2009). In 2008, 45% of the territory of Paragominas was deforested or degraded, in the proportion of 874 thousand hectares (Santos *et al*., 2017). In the same year, Paragominas was included in the list of the most deforested municipalities, motivating the Brazilian Institute of the Environment and Renewable Natural Resources to carry out actions to combat deforestation, illegal timber production and coal production, causing some loggers burn the thirst The organ. (Barreto and Araújo 2012). Graph 1 indicates deforested areas from 2001 to 2008. The municipality of Paragominas was included in the list of 36 major deforestation of the Amazon biome by the Ministry of the Environment in January 2008, thus becoming a priority to combat illegal deforestation. Still in 2008, 748 thousand hectares, uniform to 38.7% of the forest municipality removed, would be enough to maintain the main economic activities in 2007 to 2008 (Pinto *et al*., 2009). The economic results that the BR-010 brought negative impacts to the environment with the growth of livestock, agriculture and wood in the municipality.



Source: Adapted from Pinto et al. (2009)

Graph 1. Deforested area 2001-2008

'Green' recovery of Paragominas: In January 2008, Paragominas was appointed by the Ministry of the Environment as one of the 14 largest examples characterized as deforestation in the Amazon biome (Santos *et al*., 2017). To the detriment of this, Guimarães *et al*. (2013, p.12) affirm that "the largest and most important companies and commercial images are negatively affected, being one of the main factors that drove the yearbook". After acquiring this stigma, there was a remodeling in this scenario that led the Paragominas prefecture to announce in 2008 the project "Green Municipality", which allowed one of the pioneer municipalities to leave the List of priority municipalities of the Amazon for prevention actions, monitoring and control of illegal deforestation, also called the Dirty List of Deforestation, which was launched by the Ministry of the Environment (Carneiro and Assis 2015). In order to define what a Green Municipality is, in specific terms, the following requirements are taken into account: i) it performs a municipal management of the environment in a transparent and participative way; ii) eliminates illegal deforestation and forest degradation; iii) follows forest management; iii) strengthens agriculture in open areas; iv) reforestation and / or restoration of degraded areas; and evolves Areas of Permanent Preservation and Legal Reserve Areas, in addition to promoting the inclusion of all rural producers in the Rural Environmental Registry and the Rural Environmental License, which consequently brings effectiveness the environmental management, therefore, these conduits provide an increase in

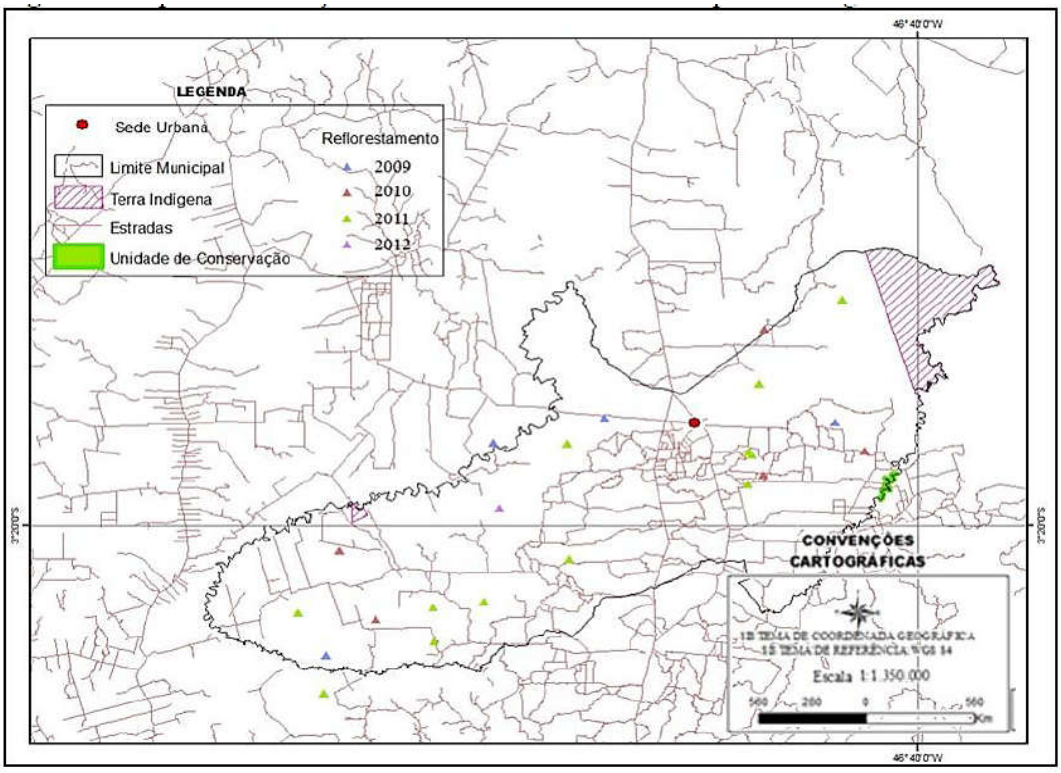
legal security, which enables investments with socio-environmental quality (Guimarães *et al*., 2013).

Thus, for the effectiveness of the action, the mayor of the city was able to register 51 local entities for the implementation of the Zero Deforestation Pact, which put environmental education in practice for 30 thousand students and regularize the land in the municipality (Alves *et al*., 2015), for which it was supported by several local productive sectors: the Paragominas Rural Producers 'Union, the ParagominasSerraria Industries Union, the Rice and Corn Producers Association, the Paragominas Merchants' Union, the Chamber of Commerce, the State Secretary. by the Environment, Institute of Man and Environment of the governmental organization of the Amazon The Nature Conservancy (Pinto *et al*., 2009). According to Decree No. 6,321 / 2007, in its art. 1, the actions to protect areas at risk of degradation and rationalization of land use, to prevent, monitor and control illegal deforestation (Brazil 2007) two strategies were implemented: deforestation and support to the registration of rural properties in the Environmental Registry . To this end, the Institute of Man and the Environment of the Amazon began sending monthly deforestation - originated by the Deforestation Alert System - to the Municipal Environment Secretariat (Barreto and Araújo, 2012).The experience of the Green Municipality Program can be considered as an initial stage of the process of ecological modernization (Mol *et al*., 2000). Initiatives to foster a technological transition process, in order to allow the large and medium-sized transport processes to be carried out more intensively, using more intensive land-based activities (Carneiro and Assis 2015).

2017). Thus, a new stage began in Paragominas, the development of a course that developed against public policies for socio-environmental development, in addition to the new management practices of a local economy, with the process of reforestation with native species of the region. Such as cedar, mahogany, darco, maçaranduba, timborana, paricá, samaúma and eucalyptus, which is a unique plant not native to the region. The bound, transmuted a situation of Paragominas and became an example of sustainability (Alves *et al*. 2015).In Figure. 01 Santos *et al*. (2017) demonstrate a location of the areas that were reforested in the municipality of Paragominas between 2009 and 2012. He reforestation process in question is considered as a result of a set of measures that are taken through the Modelo de Municipio Verde. In addition, it is worth mentioning that the main factors that influenced and promoted the situation were a "strategy to focus deforestation policy in the municipality and the strategy of decapitalization of rural producers as promoters of deforestation" (Carneiro *et al*. 2015 p.54). Moreover, "since the credit strategy in accounting is limited to credit. Especially in municipalities where livestock farming is a predominant activity, fewer resources respond to less deforestation "(Assunção *et al*. 2013 p.5).

MATERIALS AND METHODS

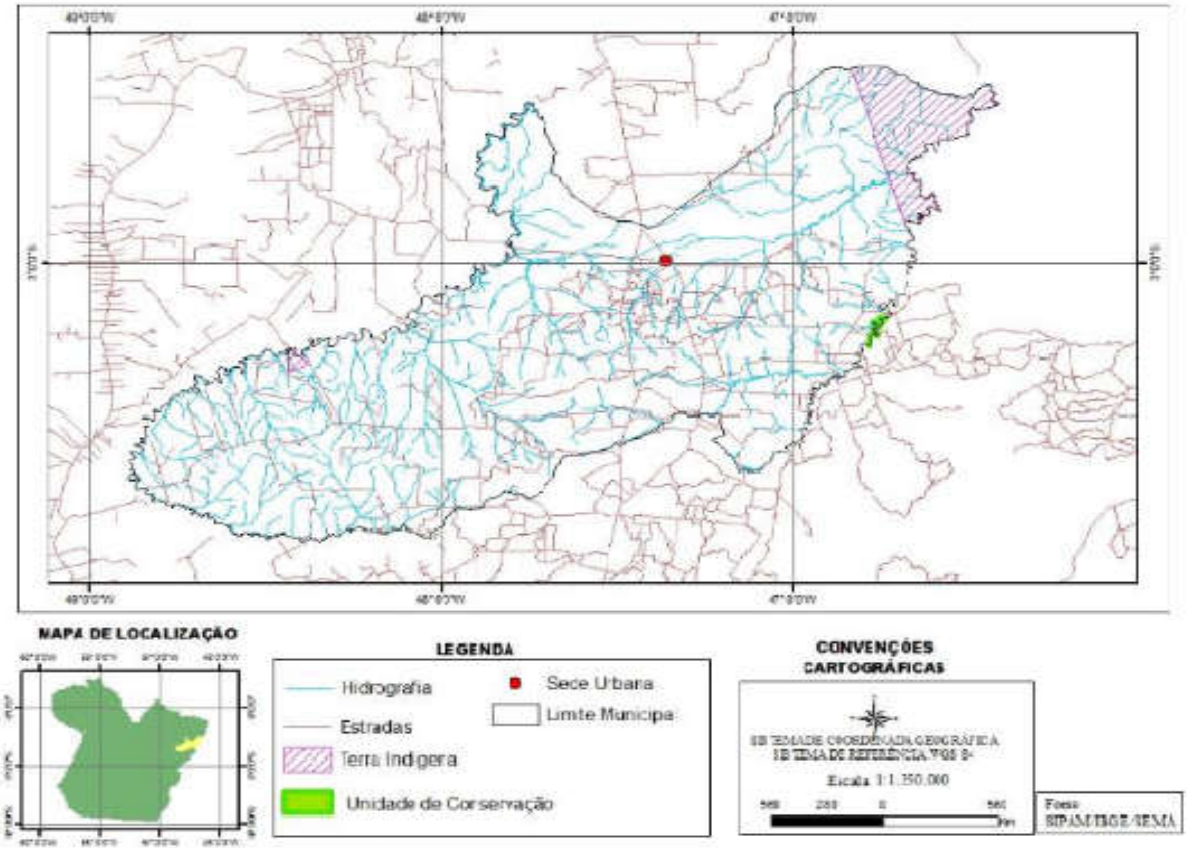
The present study is based on a review of the literature, in which periodicals, books, magazines, as well as dissertations and searches on websites are consulted. The bibliographical research, in the perspective of Martins and Pinto (2001), aims to clarify and debate a theme with its references as well as to



Source: Santos et al., (2017)

Figure 1. Map of location of reforestation in Paragominas

In fact, reforestation is a key factor for the municipality of Paragominas, because it is a member of the city and is capable of generating a series of profitable goals, more varied economic activities such as the paper industry, pulp and the lack as well as the impact on natural formations (Lima *et al*. know and to divulge scenarios on the theme. "In this sense, bibliographic research is not only a repetition of the literature on thematic dependence, but favors the analysis of a theme about the new perspective and the new goals" (Vechi and Magalhães Junior 2018 p 498).



Source: Santos et al., (2017)
Source: Santos et al. (2017)

Figure 2. Location map for Paragominas

Table 1. Comparison of 2006, 2008 and 2017 data

	2006	2017
Agropecuária	609.576 ha	856.018 ha
	2008	2017
Arroz	30. 750 t	9.570 t
Milho	100.245 t	47.355 t
Soja	35.160 t	439.326 t

Source: IBGE, 2019.

Study area: O município de Paragominas, localizado no nordeste do Estado do Pará (Fiigura 2), que em 4 de janeiro de 1965, sob a Lei Estadual nº 3.225, foi classificado como município e coberto por dados sobre sua população, estimado em 2018 de 111.764 mil habitantes (IBGE, 2018). According to Bastos *et al*. (1993), the soil of Paragominas is in the group Yellow Latosol, consists of being deep, drained, poor and clayey. The vegetation formed in dense tropical forest, with mesothermic and humid climate, temperature is 25º C annually and humidity around 85% (Martins *et al*. 2013).

RESULTS

According to Carneiro and Assis (2015), the factors that led Paragominas to leave the list of the most deforested municipalities in the Amazon are allusive to the inherent aspects of the social mobilization that occurred in that location, which involves: i) domination of the local political process , ii) the collaboration of the local economic elite with non-governmental organizations, and iii) financial assistance from some environmental funds, such as the Vale Fund, which underpinned the implementation of the Green City.

Still in consonance with the same authors, as previously seen was conducted by several entities, its main characters were the municipal public manager. As previously mentioned, the reforestation of the deforested areas of Paragominas was carried out with species native to the Amazon, with the exception ofeucalyptus. This origin of Australia, Tasmania and other islands of Oceania. According to Embrapa (2017), eucalyptus presents different physical and chemical properties that allow it to be used for various fins such as firewood, cuttings, moirões, dorado, charcoal, fibers and even furniture, energy generation, medicines etc. , even with the same degree of origin class, this country is part of income generation. Silva (2014) points out that it is one of the issues that most concerns the economies of the municipality of Paragominas, since an environmental recovery affects a direct economy, since the municipality can become involved in provocations by deforestation. Costa and Fleury (2015) cite that the Program, triggered by the Public Works Fund, the Federal Government and other programs to support the actions, however the success of the program should also make an acceptance of the participation of ranchers, farmers and loggers who observe the benefits that would bring the main measure for progress and adherence to embargoes because of deforestation. According

to information from Simões (2018), in 2012, after the actions of the Program, Paragominas reappeared in the list of the ten municipalities that contributed the most to the Gross Domestic Product of the State. In the current scenario, the consideration of the largest soybean producer in Pará, above the main pasture areas, the implementation of the Rural Environmental Training was fundamental for the planting of grains. Data such as this show that the reforestation does not negatively interfere in the agricultural and livestock production of Paragominas. Data from 2017 of IBGE include, among others, the main sources of economy of Paragominas, where 856,018 hectares of agriculture were exported. In the agricultural sector, 9,570 tons of rice, 47,355 maize and soybean were exported to 439,326 tons. In 2006, the agricultural sector occupied 609,576 hectares, and in 2008, the year with the entry of the most deforested fruits, the production of rice was 30,750, 100,245 for corn and soybean was 35,160 tons. Comparing the data in Table1 ,it is better that the process such as rice and what is new in production, unlike agriculture and livestock, has achieved more grazing and soybean production has increased.

The positive results obtained in Paragominas through the Green Municipalities Program and public policies of the municipality were satisfactory in reaching certain goals, becoming a state policy and example for those who want to apply the actions, bringing together, until 2017, 121 municipalities registered in the Municipality Program Verde and the Rural Environmental Registry covering 75.61% of the territory of Pará. The reforestation project is highlighted in social media outside of Pará, such as magazines and newspapers, being a model of sustainability in the Amazon, the Institute of Man and Environment of the Amazon reported that, in the year 2013 after observing the actions carried out in the municipality and its As a result, eleven cities have followed the example of Paragominas, which is based on maintaining economic activities, nevertheless maintains preserved areas. For the magazine Exame in 2011, just three years after being included in the list of most deforested, also highlighted the municipality, which was once marked by deforestation and violence, became a model city for sustainability and environmental management and resulted in the creation of the Program Green Municipalities.

Conclusions

As a basis all presented in this study, it is identified that the planning actions that Paragominas prefecture sought to implement in order to get out of the deforestation list occurred mainly due to the credit blockage followed by the impossibility of the rural producers to market their products , leading to a crisis. Thus, given that the main productive chains of this territory are the production of grains, pastures and wood extraction - activities that drive deforestation - it becomes mandatory environmental awareness. Therefore, the insertion of the municipality into the Green MunicipalityProgram led to environmental adjustments, in order to mitigate the negative impacts caused by nature. This was all possible thanks to the hard work of public management together with rural producers. In addition, the collaboration of The Nature Conservancy in encouraging the environmental registry and the Institute of Man and the Environment of the Amazon with support in monitoring provided land legality and control against deforestation, respectively, through mapping and diagnoses about that region, as well as the composition of projects focused on environmental education for the general population. In this sense, the Program contributed to the process of reforestation of degraded areas, in which the substitution of predatory extractivism was carried out. This reflects directly in the expansion of sources of income for the city, since the reforestation with the diverse species like eucalyptus, that can be used for the manufacture of furniture and charcoal and paricá with the strong appeal to the production of plywood, characterizing in the representation of new economic alternatives generating wealth in a sustainable way. It is also worth noting that Paragominas acquired the first MDF (wood-based fiber board) plant in the north and northeast.

From the political point of view, the legitimacy of the time management, together with its competence and commitment, helped to formalize laws concerning the defense of the native forest, stimulating and further stimulating the transformation of that negative scenario. However, through the experience of being a green municipality and the fact that the city of Paragominas has been a pioneer in getting off the dirty list of deforestation, it is evident that it is possible to increase productivity, keep the economy stable even with the reduced areas and still make the proper preservation of legal reserves. With this, attention is drawn to the other municipalities that are still on the dirty list, to review their environmental practices, making it clear that the 'green commitment' is viable and worth while recognizing its importance and adhering to a new model of survival, in order to make them a model of sustainable development for the Amazon.

REFERENCES

Alves, RL; Palheta, GC; Andrade, OF. 2015. “Paragominas se torna exemplo de sustentabilidade combatendo o desmatamento na Amazônia”.XI Fórum Ambiental da Alta Paulista, v. 11, n. 7, 2015, pp. 21-35. ISSN 1980-0827. Available in https://www.amigosdanatureza.org.br/publicacoes/index.php/forum_ambiental/article/view/1111/1134.

Assunção, J, Gandour, C, Rocha, R. 2013. “Crédito afeta desmatamento? Evidência de uma política de credito rural na Amazônia – Sumario Executivo”. Climate Policy Initiative/Núcleo de Avaliação de Politicas Climáticas/ PUC: Rio de Janeiro. Available in https://climatepolicyinitiative.org/wp-content/uploads/2013/01/Does-Credit-Affect-Deforestation-Executive-Summary-Portuguese.pdf

Barreto, P, Araújo, E. 2012. “O Brasil atingirá sua meta de redução do desmatamento?”Belém, PA: Imazon. Available in https://imazon.org.br/o-brasil-atingira-sua-meta-de-reducao-do-desmatamento/

Bastos, TX, Rocha, AMA, Pacheco, NA, Sampaio, SMN 1993.“Efeito da remoção da floresta ombrófila sobre o regime pluviométrico no município de Paragominas-Pa”. Comunicações. Rio Claro, vol. 23, p 45-46. Available in https://www.alice.cnptia.embrapa.br/alice/bitstream/doc/397241/1/0921.pdf

Borges, FH. 2007. “O meio ambiente e a organização: um estudo de caso baseado no posicionamento de uma empresa frente a uma nova perspectiva ambiental”. Masters dissertation – Post-Graduation Program and Area of Concentration: Production Engineering. School of Engineering of São Carlos, University of São Paulo.

Brasil. Lei nº 12.757, de 17 de outubro de 2012. Available in http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12727.htm

Callou, RNL. 2017. "O sonho de fundação de Paragominas-Pa e o Projeto Nacional-Desenvolvimentista na Amazônia: memórias, narrativas e identidades". Masters dissertation. Postgraduate Program in Languages and Knowledge in the Amazon, Federal University of Pará.

Carneiro, MS, Assis, WS. 2015. "O controle do desmatamento na Amazônia como um processo de modernização ecológica: A experiência do projeto município verde". Repocs, v.12, n.24. Available in http://www.periodicoseletronicos.ufma.br/index.php/rpcsoc/article/view/3640/1638

Carvalho, TS, Magalhães, AS, Domingues, EP. 2016. "Desmatamento e a contribuição econômica da floresta na Amazônia". Estud. Econ., São Paulo, vol.46, n.2, p. 499-531, abr.-jun. 2016. Available in http://www.scielo.br/pdf/ee/v46n2/0101-4161-ee-46-02-0499.pdf.

Castelo, TB, Almeida, OT. 2015. "Desmatamento e uso da terra no Pará". Revista de Política Agrícola, n1. Available inhttps://seer.sede.embrapa.br/index.php/RPA/article/view/970/861

Costa, JM, Fleury, M-F 2015. "O Programa Municípios Verdes: estratégias de revalorização do espaço em municípios paraenses". Ambiente & Sociedade. São Paulo v. XVIII, n. 2, p. 61-76. Available inhttp://www.scielo.br/pdf/asoc/v18n2/pt_1414-753X-asoc-18-02-00059.pdf

Diederichsen, A, Gatti, G, Nunes, S, Pinto, A. 2017. "Diagnóstico dos Fatores Chave de Sucesso para a Restauração da Paisagem Florestal". Curitiba/Belém: IMAZON. Available in https://imazon.org.br/PDFimazon/Portugues/livros/Diagn%C3%B3stico%20Restaura%C3%A7%C3%A3o%20Florestal_Paragominas%20e%20PA.pdf

Green Municipalities Program. Municípios participantes. Available in www.municipiosverdes.pa.gov.br/pages/municipios_participantes

Guimarães, J, Verìssimo, A, Amaral, P, Pinto, A, Demachki, A 2013. "MUNICIPIOS VERDES: caminhos para a sustentabilidade". Belém, PA: Imazon, 2013.Available in https://imazon.org.br/municipios-verdes-caminhos-para-a-sustentabilidade-2a-edicao/

IBGE. Instituto Brasileiro de Geografia e Estatística. Available in https://cidades.ibge.gov.br/brasil/pa/paragominas/historico

Lima, IV, Silva, MB, Adami, M, Pinheiro, AF, Barros, MNR, Narvaes, IS, Gomes, AR, Watrin, OS, Magno Júnior, PSL, Rocha, ES. 2017. "Dinâmica das áreas de reflorestamento no município de Paragominas, Estado do Pará, considerando dados temporais do projeto TerraClass". In: XVIII Simpósio Brasileiro de Sensoriamento Remoto-SBSR, Santos-SP. Anais... Santos-SP: INPE, Brasil. Available in https://seer.sede.embrapa.br/index.php/RPA/article/view/970

Martins, GA, Pinto, RL. 2001. Manual para elaboração de trabalhos acadêmicos. São Paulo: Atlas.

Martins, HD, Nunes, SS,Salomão, RR, Oliveira Jr, LA; Batista, RB, Martins, JR, Souza Jr, CM 2013. "Mapeamento da cobertura do solo de Paragominas-PA com imagens de satélite de alta resolução: aplicações para o Cadastro Ambiental Rural (CAR)". In Anais XVI Simpósio Brasileiro de Sensoriamento Remoto - SBSR, Foz do Iguaçu, PR, Brasil, INPE. Available in https://imazon.org.br/PDFimazon/Portugues/congressos%20e%20anais/p0598.pdf

Moura, R, Santos, D, Verrísimo, A, Nunes, S, Brito, B, Barreto, P, Martins, H, Celentano, D. 2017. Desmatamento Zero No Pará: Desafios E Oportunidades. Belém: IMAZON. Available in https://imazon.org.br/PDFimazon/Portugues/livros/Desmatamento%20Zero%20no%20Para.pdf

Pinto, A, Amaral, P, Souza Jr; C, Veríssimo, A, Salomão, R, Gomes, G, Balieiro, C 2009. "Diagnóstico Socioeconômico e Florestal do Município de Paragominas. Relatório Técnico". Belém/PA: IMAZON. Available in https://imazon.org.br/PDFimazon/ Portugues/outros/iagnostico-socioeconomico-e-florestal-do.pdf

Sambuichi, RHR, Oliveira, MAC, Silva, APM,Luedemann, G 2012. "Texto para discussão / Instituto de Pesquisa Econômica Aplicada – Brasília". Rio de Janeiro: Ipea, 2012.Available in http://repositorio.ipea.gov.br/bitstream/11058/1050/1/TD_1782.pdf

Santos, EM, Santos, FAA, Gomes, MVCN, Santos, VC, Neves, RR. 2017. "Análise espacial das ações do programa "municípios verdes: Estudo de caso no município de Paragominas- PA". Revista Brasileira de Gestão Ambiental, v. 11, n.1, p.21 – 35. Available inhttps://gvaa.com.br/revista/index.php/RBGA/article/view/4691

Silva, LCT 2014. "Avaliação do Projeto Público "Paragominas: Município Verde" sob a ótica das mudanças climáticas". Masters dissertation. Postgraduate Program in Sustainable Development of the Humid Tropics, Federal University of Pará.

Simões, IOPS 2018. "Análise da intensificação da pastagem no município de Paragominas - PA entre os anos de 2004 e 2017 Masters dissertation. Faculty of Agricultural Engineering. Campinas.

Vechi, A, Magalhães Júnior, CAO. 2018. "Aspectos positivos e negativos da cultura do eucalipto e os efeitos ambientais do seu cultivo". Revista Valore, Volta Redonda, n3, v1, p 495-507. Available in https://revistavalore.emnuvens.com.br/valore/article/view/101

Zacarias, EFJ, Higuchi, MIG. 2017. "Relação pessoa-ambiente: caminhos para uma vida sustentável". Interações, Campo Grande, MS, v. 18, n. 3, p. 121-129. Available in http://www.scielo.br/pdf/inter/v18n3/1518-7012-inter-18-03-0121.pdf.

****