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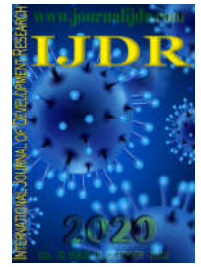
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RESEARCH ARTICLE

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## AGRIBUSINESS IN THE BRAZILIAN AMAZONIA: A GENERAL OVERVIEW

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### ABSTRACT

This work presents a study on agribusiness in the Brazilian Amazonia (Legal Amazonia) to characterize the use of land, production, and export agricultural and livestock of the member states. The results show that agribusiness applied sustainably reduces negative environmental impacts. However, the population's salary is still lower compared to the rest of Brazil. Finally, this work presents a proposal to create an Amazonian Observatory of Agronomic Knowledge (OBAMA) to promote social, economic, and environmental sustainability in the Legal Amazonia.

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## INTRODUCTION

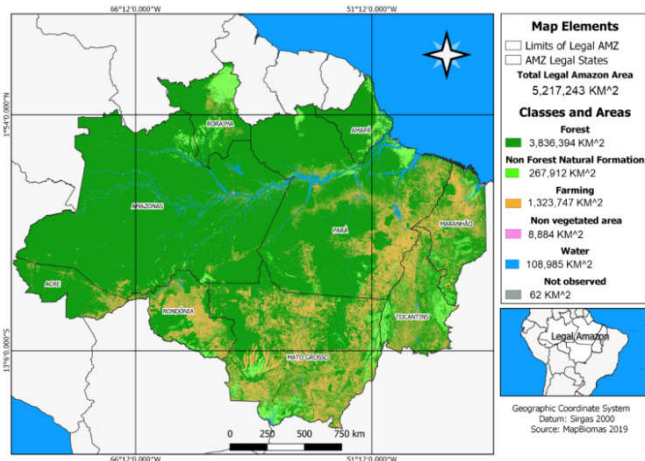
The Amazonian Rainforest is comprised of the immense Amazon River basin, the largest river basin on the planet. There are 25 thousand kilometers of navigable rivers. The area covers six countries: Brazil, Peru, Bolivia, Ecuador, Colombia, and Venezuela (BBC, 2009; CINDRA, 2020). Currently, the Brazilian Amazonia (or Legal Amazonia) is composed of the states of Acre, Amapá, Amazonas, Mato Grosso, Pará, Rondônia, Roraima and Tocantins and part of the state of Maranhão (west of the meridian of 44° west longitude) and comprises an area of approximately 5,217,423 km<sup>2</sup> corresponding to about 61% of the Brazilian territory (EMBRAPA, 2020), as shown in Figure 1.

Amazonia region is rich in natural resources and great territorial extension; therefore, it is seen as a viable area for agribusiness execution. The recent changes in the climate and the increasing world population have increased the importance of agribusiness, making it a highly active topic to sustainably supply society's demands in terms of agricultural resources (EMBRAPA, 2020). According to Figure 1, there is more than 132,374,688 ha of areas dedicated to agriculture and livestock. The Legal Amazonia is divided into:

- **Western Amazonia:** Amazonas, Acre, Rondônia, and Roraima.
- **Eastern Amazonia:** Tocantins, Pará, Amapá, Mato Grosso, and Maranhão.

Even occupying almost 61% of the Brazilian territory, the population residing in the Brazilian Amazonia, however, corresponds to 12.32% of the total population of Brazil, with an average growth of 1.64% per year since 2000 (CINDRA, 2020). In 2017, the Brazilian Amazonia contributed 8% to the Brazilian Gross Domestic Product – GDP (AMAZONIA.ORG, 2018; IBGE, 2017). In the Brazilian Amazonia, the agricultural expansion was contemplated by the II National Development Plan in the late 1970s (PND, 1980) and the II National Regional Development Plan for the legal Amazon in 2007 (PRDA, 2020), which enabled the production of oilseeds in the region (Nahum & Santos, 2015). The uncontrolled advance of agriculture and ranching in the legal Amazon results in fragmentation of endogenous territorial coherence, which favors large companies' global logic instead of local production systems, especially the Amazon ecosystem (Silva, 2015). The uncontrolled change in land use/management dynamics in the Amazon is reflected in agrarian conflicts, environmental impacts, deforestation, and

burning with periods extending each year (Costa et al., 2017; Silva, 2015; WWF, 2019). Such situations negatively compromise the sustainable development of the Brazilian Amazon.



**Figure 1. Land and use a map of the Legal Amazonia**

The 2017 agricultural Brazilian census shows that the number of agricultural establishments in the country with Internet access increased by 1,790.1% compared to the previous survey. In 2017, 1,425,323 producers declared access to the world computer network, and in 2006 this number was only 75,000 (IBGE, 2017). Even with the advance of information and communication technologies in the rural environment, the Legal Amazon is the most backward region concerning the rural area of Brazil connected to the Internet, and approximately 80% of these areas live isolated from the Internet, which limits the integration of producers, companies, and research/educational institutions (IBGE, 2017; Santana, 2020). The Agribusiness has a pillar of sustainability and technology to maintain the Amazonia fauna and flora through the scientific knowledge allied to recovery and reforestation practices. According to the Brazilian agricultural research company (EMBRAPA, 2019), the connected farmer will have access to knowledge and conservation practices through a set of digital and integrated technologies, such as software, systems, and equipment, with the capacity to optimize agricultural production, in all its phases. Technologies such as Drones, sensors, GPS, and data analysis software can, for example, verify the need for water or fertilizer on a plantation or to manage the property or to find pests and diseases on plants accurately (O. A. Chase et al., 2014, 2018; EMBRAPA, 2020; Soares et al., 2020). Because of the above. This work aims to identify the use of land, production, and exports of agricultural origin from the Legal Amazon in the context of Agribusiness. Besides this introduction, section two presents the Agribusiness in the Brazilian Amazonia, section three presents the discussion and proposal to the Legal Amazonia, and section four presents the conclusion of this work.

**Agribusiness in Brazilian Amazonia:** As seen in the introduction, in 2017, the Brazilian Amazon contributes 8% to the Brazilian GDP, but with an average salary of 20% lower than the average for Brazil (IBGE, 2017). The inferiority of the average salary reflects an economy based on vegetal and mineral extraction. The Brazilian Amazon may be the richest in natural biodiversity, but it is the least industrialized area. According to the economist Tatiana Pinheiro of the Santander bank, socio-economic indicators show that the current economic development policies have not yet been sufficient to bring the region closer to the average national income.

However, even in the face of industrial and socio-economic difficulties, the sustainable economy's capacity to attract investments is high (Pinheiro, 2018). The main constraints to development in the Brazilian Amazonia are uncontrolled deforestation and urban pressure (Staevie, 2018); the difficulty of access to communities in the Amazon, energy and information and communication technology deficiency - ICT (Ferreira et al., 2020; Pinheiro, 2018). Therefore, sustainable solutions to these limitations are necessary, such as the polycentric development of localities, land regularization, renewable energy generation, technological innovation, and waterways maintenance/creation (O. Chase et al., 2020). According to the Confederation of Agriculture and Livestock in Brazil - CNA, in 2019, the sum of commodities and services related to agribusiness reached R\$ 1.55 trillion or 21.4% of Brazil's GDP (CNA, 2020). The largest share corresponds to agriculture, with 68% of this value (R\$ 1.06 trillion), while agribusiness corresponds to 32% (R\$ 494.8 billion). Agriculture is responsible for one-fifth of Brazil's GDP, the only national economic activity to grow in 2020 amid the new coronavirus pandemic (ESTADAO, 2020; MAPA, 2020a). In a projection 2019-2030 of the Ministry of Agriculture and Livestock - MAPA, in Brazilian agriculture, the greatest demand items will be soybeans, cotton, cellulose, sugar, mango, grapes, melons, and papaya. In Brazilian livestock, beef, pork, chicken, and milk (MAPA, 2020b). Some products are highlighted in the agricultural production in the Legal Amazon and have expressive numbers in the exportation of the region, moving positively to the country's economy. In 2017, the first on the list in this ranking of exported products are: soybean complex (US\$ 13,487,695,928), meat (US\$ 2,439,513,620) and forest products (US\$ 1,543,744,381) (AGROSTAT, 2020; IBGE, 2017). Figure 2 shows the exports from the Legal Amazon in 2017 by agricultural activity.



**Figure 2. Legal Amazon exports in 2017 by agricultural activity (AGROSTAT, 2020; IBGE, 2017)**

In an analysis of data made available by the Brazilian Agribusiness Statistics System (AGROSTAT, 2020), this survey identified that in 2019 exports of agribusiness from the Legal Amazonia corresponded to approximately 25% (US\$ 23 billion) of national agribusiness (US\$ 92.8 billion), with the state of Mato Grosso being the first in the national export ranking, with a 17.4% share. In second place comes the state of São Paulo with 15.76%. Besides the state of Mato Grosso, the other states of the Legal Amazonia are in the following positions: Pará (10%), Maranhão (11%), Tocantins (11%), Rondônia (12%), Amazonas (17%), Roraima (22%), Amapá (24%) and Acre (26%). Table 1 presents the dimension of Agronomy in the Brazilian Amazonia according to the latest agricultural census.

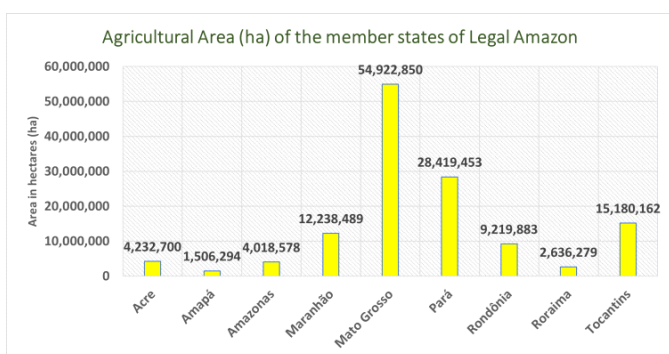
**Table 1. Panorama of Agronomy in the Legal Amazonia in 2017**

State	Number of producers	Number of Establishments	Agricultural Area (ha)	Exports (US\$)	Exports (%) and Ranking
Acre	126,514	37,356	4,232,700	20,171,636	0.1 (9°)
Amapá	31,098	8,507	1,506,294	95,782,079	0.474 (7°)
Amazonas	330,719	80,959	4,018,578	226,084,180	1.121 (6°)
Maranhão	692,870	219,765	12,238,489	1,559,489,142	7.732 (3°)
Mato Grosso	422,453	118,679	54,922,850	14,556,654,983	72.179 (1°)
Pará	979,648	281,699	28,419,453	1,692,504,584	8.392 (2°)
Rondônia	270,812	91,438	9,219,883	1,026,033,773	5.087 (4°)
Roraima	67,070	16,846	2,636,279	40,253,020	0.199 (8°)
Tocantins	204,430	63,808	15,180,162	950,247,484	4.711 (5°)
TOTAL	3,125,614	919,057	132,374,688	20,167,220,881	100%
Legal Amazonia	producers	establishments	hectares	(US\$ 20.1 billion)	

\* Font: Own elaboration, data extracted from (AGROSTAT, 2020; IBGE, 2017).

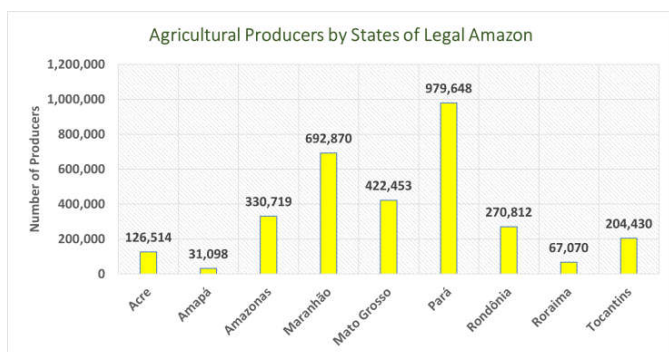
Mato Grosso is the largest producer of grains (soybeans) and cattle in Brazil, resulting from the larger agricultural area available, as shown in Figure 3.

Pará is the state with the largest number of producers (979,648) and agricultural establishments (281,699) in the Legal Amazon. Thirty-five thousand four hundred of these establishments are dedicated to Açaí production (IBGE, 2017). According to the former Minister of Agriculture Blairo Maggi: "Pará has the rivers to transport the grains and the proximity to the big seaports, besides having a larger extension than Mato Grosso. Therefore, Pará is the state of the future of agribusiness in Brazil" (BOGÉA, 2017). The Gross Production Value – GPV (VBP in Brazil) of Agricultural presents the evolution of crops and livestock's performance throughout the year and corresponds to the establishment's gross revenue. It is calculated based on crop and livestock production and producers' prices in the country's leading markets (MAPA, 2020c). Mato Grosso is the largest producer of soy, corn, and cotton plume complex. In September 2020, it reached a GPV of R\$145.8 billion, the largest in Brazil. The state of Paraná comes in second with R\$103.2 billion, while the state of São Paulo comes in third with a GPV of R\$ 97.6 billion. The state of Pará is in tenth place, with a GPV of R\$ 18 billion (COMEX BRASIL, 2020). In Pará, the soybean complex is already the main item on the agribusiness export agenda, representing about 25% of the sector (AGENCIAPARÁ, 2020; FAEPA, 2019). The soybean complex is currently the leading product on the Brazilian export agenda (AGROSTAT, 2020; Campos et al., 2017; Sardinha & Lopes, 2018).

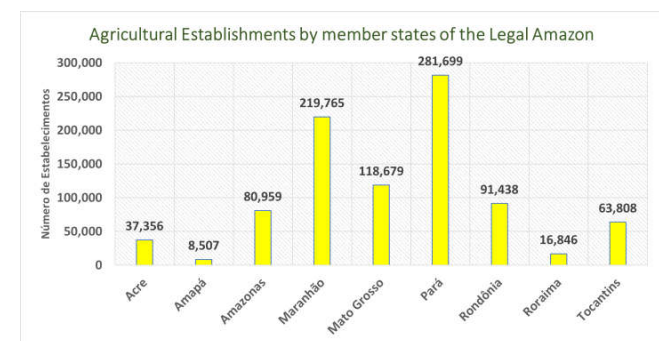


**Figure 3. Area occupied in hectares (ha) by agricultural establishments by states of legal Amazon**

However, Pará and Maranhão have more producers and agricultural establishments than the state of Mato Grosso, as shown in Figure 4.



(a)



(b)

**Figure 4. The number of producers (a) and agricultural establishments (b) in the Legal Amazon**

## DISCUSSION AND PROPOSAL

This research has identified that the lack of procedures, techniques, and low-cost technologies for capturing, processing, and visualizing information and generating knowledge of agricultural production in Brazilian Amazonia contributes to the entropy of sustainable land use and local production systems. Therefore, there is not yet a knowledge management mechanism existing in Amazonia's agricultural production that updates and integrates local producers and educational/research institutions in the face of regional, national, and international demands. According to the Brazilian Agribusiness Association – ABAG, the success of Brazilian agribusiness will only come through a strategic policy that is in line with the desires and trends of the new consumer society (transparency, sustainability, traceability), the new standards of innovation, technology, and health in production and consumption (ABAG, 2019). Therefore, solutions that promote agricultural sustainability must be created for the particularities of the Legal Amazon. The Amazon region and its continental territorial extension

congregate different natural, social, economic, and cultural ecosystems that coexist in an environment with great diversity. Although they coexist spatially, the tremendous physical distances make the actors' relations difficult when we think about the generation and transference of knowledge, it is noted that in this research, the types of knowledge worked are those recommended by Nonaka & Takeuchi (2019) in his work "Creation of Knowledge in the Enterprise" in which they call Tacit Knowledge being all knowledge challenging to explain, that which the individual acquires through his personal relations and abilities built through his interactions and which is difficult to extract and explain. Otherwise, the Explicit Knowledge comes to be the knowledge that is codified, printed, worked, and stored in the various media built by man as time goes by; this type of knowledge is easy to acquire for the individual to internalize. Based on Nonaka and Takeuchi's knowledge management, this research proposes to create an Observatory for Amazonian Knowledge of Agronomy (OBAMA) to integrate producers, companies, and research/education institutions. OBAMA should be a virtual platform (internet portal) to map and disseminate producers and agricultural solutions in the Brazilian Amazonia context. OBAMA's knowledge could guide the development of a sustainable agribusiness model and help in the decision-making society in the policies of preservation and sustainable use of the Amazon natural resources. UFRA is developing OBAMA, currently in the project phase, with implementation expected in 2021/2022. Figure 5 presents the OBAMA logo.



**Figure 5. Logotype of the Observatory for Amazonian Knowledge of Agronomy (OBAMA)**

The capacity to generate knowledge based on the integration of production, sustainability, and bio-economy will have a significant impact on Amazonian agricultural production, which should move from uncontrolled extractive and subsistence processes to production on a safe scale; reducing social and economic inequality with the rest of the country, and making the Brazilian Amazonia an example of agricultural potency to be followed.

## CONCLUSION

This work presented a study on Agribusiness in the Brazilian Amazonia. Potentialities and Weaknesses were presented, and the proposal to create an observatory in the context of knowledge management for sustainable agronomy in the Amazon (OBAMA). Since the year 2000, the Amazonian agricultural trade is migrating from uncontrolled extractive to sustainable and technological agribusiness. Therefore, proposals for solutions such as OBAMA are essential for the

particularities and demands of the Amazonian region, whose objective is to increase the speed of sustainable agricultural innovation and social welfare. The next steps of this work are developing an expanded study of agribusiness and Internet access feasibility for Amazonian communities; and implementing the OBAMA portal.

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## REFERENCES

- ABAG. (2019). Agronegócio vira campo fértil para empresas de TI. Abag. [http://www.abag.com.br/sala\\_imprensa/interna/abagti](http://www.abag.com.br/sala_imprensa/interna/abagti)
- AGENCIAPARÁ. (2020, August 27). Soja é o principal produto agro exportado pelo Pará. Agência Pará de Notícias. <https://agenciapara.com.br/noticia/21749/>
- AGROSTAT. (2020). MAPA Indicadores. <http://indicadores.agricultura.gov.br/agrostat/index.htm>
- AMAZONIA.ORG. (2018). Economia da Amazônia brasileira cresce mais que a média do país, mas rendimento na região continua menor, diz estudo – Amazônia.org. <https://amazonia.org.br/2018/09/economia-da-amazonia-brasileira-cresce-mais-que-a-media-do-pais-mas-rendimento-na-regiao-continua-menor-diz-estudo/>
- BBC. (2009, July 22). A Amazônia em números. BBC News Brasil. [https://www.bbc.com/portuguese/noticias/2009/07/090722\\_a\\_mazonia\\_numeros\\_fbd](https://www.bbc.com/portuguese/noticias/2009/07/090722_a_mazonia_numeros_fbd)
- Campos, M. A., Wander, A. E., Carvalho, C. R. R., & Costa Filho, B. A. da. (2017). Competitiveness of the soybean complex in Brazil: Enhancers and inhibitors. *Revista Sodebras*, 12(138), 70–76. <https://core.ac.uk/display/212583251>
- Chase, O. A., Carvalho, A. N., Andrade, E. S. S., Almeida, J. F., & Costa, C. T. (2018). Environmental Measurement Technology: An Approach to the Amazonian Environment. *IEEE Latin America Transactions*, 16(4), 1036–1041. <https://doi.org/10.1109/TLA.2018.8362134>
- Chase, O. A., Sousa de Almeida, J. F., Brito de Souza, J. R., & Tavares da Costa Junior, C. (2014). Sensory platform architecture for IN SITU monitoring the thermal comfort in rural environments – The case study at Federal Rural University of Amazonian, Brazil. *Measurement*, 58, 294–300. <https://doi.org/10.1016/j.measurement.2014.08.031>
- Chase, O., Tourinho, M., Marques, G., Cabral, R., & Alencar, E. (2020). INDICADOR DE PEGADA ECOLÓGICA (IPE) UM ESTUDO DE CORRELAÇÃO ENTRE A PRESSÃO URBANA E O NOVO CORONAVÍRUS NO ESTADO DO PARÁ: In *Extensão Rural em Foco* (Vol. 2, pp. 89–96). <https://doi.org/10.37885/200600482>
- CINDRA. (2020). Mais Informações sobre a Amazônia Legal. Portal da Câmara dos Deputados. <https://www2.camara.leg.br/atividade-legislativa/comissoes/comissoes-permanentes/cindra/amazonia-legal/mais-informacoes-sobre-a-amazonia-legal>
- CNA. (2020). Panorama do Agro. Confederação Da Agricultura e Pecuária Do Brasil (CNA). <https://www.cnabrazil.org.br/cna/panorama-do-agro>
- COMEX BRASIL. (2020, October 9). Valor Bruto da Produção Agropecuária deste ano cresce 11,5% e é atualizado para R\$ 806,6 bilhões. Comex do Brasil. <https://www.comexdobrasil.com/valor-bruto-da-producao-agropecuaria-deste-ano-cresce-115-e-e-atualizado-para-r-8066-bilhoes/>
- Costa, M. R. T., Homma, A. K. O., Rebello, F. K., Silva Souza Filho, A. P., Costa Fernandes, G. L., & Baleixe, W. (2017).

- Atividade Agropecuária no Estado do Pará. EMBRAPA Amazônia Oriental, 176.
- EMBRAPA. (2019, May 14). Especialistas debatem o futuro da pesquisa agropecuária na Amazônia. /busca-de-noticias/-/noticia/43280439/especialistas-debatem-o-futuro-da-pesquisa-agropecuaria-na-amazonia
- EMBRAPA. (2020). Sistema Interativo de Análise Geoespacial da Amazônia Legal—SIAGEO/EMBRAPA. [https://www.amazonia.cnptia.embrapa.br/registrado\\_siageo.html](https://www.amazonia.cnptia.embrapa.br/registrado_siageo.html)
- ESTADAO. (2020, August 20). Agronegócio pode crescer de forma sustentável e sem desmatar Amazônia. <https://www.bol.uol.com.br/noticias/2020/08/26/o-agronegocio-que-funciona-sem-desmatar.htm>
- FAEPA. (2019). Agronegócio Paraense. FAEPA | Federação da Agricultura e Pecuária do Pará. <http://sistemafaepa.com.br/faepa/agronegocio-paraense/>
- Ferreira, G., Barbosa, B., Melo, A., Lopes, C., Andrade, E., Marques, G., & Chase, O. (2020). SER RIBEIRINHO – ESCOLA RIBEIRINHA SUSTENTÁVEL UM ESTUDO DE CASO NA E.M.E.F. EDMAR BARBOSA NO RIO CURURU, MUNICÍPIO DE CHAVES-PA, ILHA DO MARAJÓ.: In *Extensão Rural em Foco* (Vol. 1, pp. 204–216). <https://doi.org/10.37885/200600473>
- IBGE. (2017). IBGE - Censo Agro 2017. IBGE - Censo Agro 2017. <https://censoagro2017.ibge.gov.br/>
- MAPA. (2020a, May 29). Agropecuária é único setor da economia com crescimento na pandemia, diz IBGE. Ministério da Agricultura, Pecuária e Abastecimento. <https://www.gov.br/agricultura/pt-br/assuntos/noticias/agropecuaria-e-unico-setor-com-crescimento-na-pandemia-diz-ibge>
- MAPA. (2020b, August 17). Projeções do Agronegócio 2019-2029-30—Português (Brasil). [https://www.gov.br/agricultura/pt-br/assuntos/politica-agricola/todas-publicacoes-de-politica-agricola/projecoes-do-agronegocio/projecoes-do-agronegocio\\_2019\\_20-a-2029\\_30.pdf/view](https://www.gov.br/agricultura/pt-br/assuntos/politica-agricola/todas-publicacoes-de-politica-agricola/projecoes-do-agronegocio/projecoes-do-agronegocio_2019_20-a-2029_30.pdf/view)
- MAPA. (2020c, September 10). Valor Bruto da Produção Agropecuária (VBP). Ministério da Agricultura, Pecuária e Abastecimento. <https://www.gov.br/agricultura/pt-br/assuntos/politica-agricola/valor-bruto-da-producao-agropecuaria-vbp>
- Nahum, J. S., & Santos, C. B. dos. (2015). Uma interpretação geográfica dadendeicultura na amazônia paraense. *Revista da ANPEGE*, 11(15), 309–331. <https://doi.org/10.5418/RA2015.1115.0012>
- Nonaka, I., & Takeuchi, H. (2019). *The Wise Company: How Companies Create Continuous Innovation*. OUP USA.
- Pinheiro, T. (2018). Brasil—Amazônia Legal. Santander. [https://cms.santander.com.br/sites/WPS/documentos/arq-estudos-macro-download-03-09-18/18-09-03\\_204721\\_180903-amazonia-legal.pdf](https://cms.santander.com.br/sites/WPS/documentos/arq-estudos-macro-download-03-09-18/18-09-03_204721_180903-amazonia-legal.pdf)
- PRDA. (2020). PRDA - Plano Regional de Desenvolvimento da Amazônia Legal. <http://prda.sudam.gov.br/>
- Santana, D. (2020, February 9). Só 5 dos 144 municípios do Pará têm metade da zona rural conectada. ZÉ DUDU. <https://www.zedudu.com.br/so-5-dos-144-municipios-do-para-tem-metade-da-zona-rural-conectada/>
- Sardinha, E., & Lopes, H. D. (2018, November 15). A evolução do agronegócio na Amazônia legal brasileira: Estudo aplicado à produção de soja e seus condicionantes. *ENEGEP 2018 - Encontro Nacional de Engenharia de Produção, MACEIO/AL - BRASIL*. [https://doi.org/10.14488/ENEGEP2018\\_TN\\_WIC\\_264\\_518\\_35121](https://doi.org/10.14488/ENEGEP2018_TN_WIC_264_518_35121)
- Silva, R. G. da C. (2015). Amazônia globalizada: Da fronteira agrícola ao território do agronegócio – o exemplo de Rondônia. *Confins. Revue franco-brésilienne de géographie / Revista franco-brasileira de geografia*, 23, Article 23. <https://doi.org/10.4000/confins.9949>
- Soares, J. A. C., Farias, P. R. S., & Moutinho, M. T. (2020). ESTIMATIVA DA PRODUTIVIDADE EM PLANTIOS JOVENS DE PALMA DE ÓLEO CONVENCIONAL POR SENSOR ORBITAL NO MUNICÍPIO DE TAILÂNDIA-PA. 10, 6.
- Staevie, P. M. (2018). UM BALANÇO DAS DISCUSSÕES SOBRE OS IMPACTOS DO AGRONEGÓCIO SOBRE A AMAZÔNIA BRASILEIRA/Stock of discussions on the impact of agribusiness on the Brazilian Amazon. *REVISTA NERA*, 0(42), 98–112. <https://revista.fct.unesp.br/index.php/nera/article/view/5684>
- WWF. (2019, September 6). Um em cada três focos de queimadas na Amazônia tem relação com o desmatamento | WWF Brasil. <https://www.wwf.org.br/?72843/amazonia-um-em-tres-queimadas-tem-relacao-com-desmatamento>

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