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SOCIOSPATIAL SEGREGATION AND URBANIZATION IN PORTO VELHO, CANDEIAS DO JAMARI AND ARIQUEMES: A CRITICAL REVIEW

SEGREGAÇÃO SOCIOESPACIAL E URBANIZAÇÃO EM PORTO VELHO, CANDEIAS DO JAMARI E ARIQUEMES: UMA REVISÃO CRÍTICA

SEGREGACIÓN SOCIOESPACIAL Y URBANIZACIÓN EN PORTO VELHO, CANDEIAS DO JAMARI Y ARIQUEMES: UNA REVISIÓN CRÍTICA

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ABSTRACT

This article addresses socio-spatial inequalities and the challenges of urbanization in the city of Porto Velho, located in the Brazilian Amazon. The objective of this work is to conduct a literature review on urban expansion and socio-spatial inequality in the western Amazon, involving the municipalities of Porto Velho, Candeias do Jamari, and Ariquemes. The study was conducted through a literature review based on 16 studies published between 2015 and 2025 found in the Google Scholar and BDTD databases. The results indicate that urbanization in the municipalities occurred in a disorderly manner, driven by economic cycles and exogenous political decisions, resulting in irregular settlements, lack of infrastructure, and social exclusion. The study reinforces the importance of integrated public policies that are sensitive to regional specificities.

Keywords: Western Amazon. Irregular Occupation. Urban Planning.

RESUMO

O presente artigo aborda as desigualdades socioespaciais e os desafios da urbanização na cidade de Porto Velho, situada na Amazônia brasileira. O objetivo do trabalho é realizar uma revisão bibliográfica sobre a expansão urbana e a desigualdade socioespacial na Amazônia ocidental, envolvendo os municípios de Porto Velho, Candeias do Jamari e Ariquemes. O estudo foi realizado por meio de uma revisão bibliográfica, com base em 16 estudos publicados entre 2015 e 2025 encontrados nas bases de dados Google Acadêmico e BDTD. Os resultados indicam que a urbanização nos municípios ocorreu de forma desordenada, impulsionada por ciclos econômicos e decisões políticas exógenas, resultando em ocupações irregulares, ausência de infraestrutura e exclusão social. O estudo reforça a importância de políticas públicas integradas e sensíveis às especificidades regionais.

Palavras-chave: Amazônia Ocidental. Ocupação Irregular. Planejamento Urbano.

RESUMEN

Este artículo aborda las desigualdades socioespaciales y los desafíos de la urbanización en la ciudad de Porto Velho, ubicada en la Amazonia brasileña. El objetivo de este trabajo es realizar una revisión bibliográfica sobre la expansión urbana y la desigualdad socioespacial en la Amazonia occidental, involucrando los municipios de Porto Velho, Candeias do Jamari

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y Ariquemes. El estudio se realizó mediante una revisión bibliográfica basada en 16 estudios publicados entre 2015 y 2025, encontrados en las bases de datos de Google Scholar y BDTD. Los resultados indican que la urbanización en los municipios ocurrió de manera desordenada, impulsada por ciclos económicos y decisiones políticas exógenas, lo que resultó en asentamientos irregulares, falta de infraestructura y exclusión social. El estudio refuerza la importancia de políticas públicas integradas que tengan en cuenta las especificidades regionales.

Palabras clave: Amazonía Occidental. Ocupación Irregular. Planificación Urbana.

1 INTRODUCTION

The socio-spatial transformations that have marked the western Amazon in recent decades reveal a dynamic, complex and sometimes contradictory scenario. Among the most important processes is urban expansion in municipalities directly affected by occupation fronts, infrastructure projects and national integration policies. Rondônia, in particular, has experienced an accelerated growth of its urban areas, a fact resulting both from migratory flows and from the intensification of economic activities and the reconfiguration of relations between the countryside and the city (SILVA, 2023; FENZL et al., 2020).

In this context, municipalities such as Porto Velho, Candeias do Jamari and Ariquemes stand out for representing different scales and forms of urbanization in the region. Porto Velho, as the state capital and regional center B according to REGIC/2018, plays a main influencing role on the regional urban network, concentrating flows of goods, people, and services that overflow to neighboring cities and even to locations in Amazonas, such as Humaitá (SILVA, 2023). In turn, Candeias do Jamari illustrates an incipient urbanization process, often associated with anthropogenic pressure on protected areas, such as the Jamari National Forest (CASTRO DOS SANTOS et al., 2021 apud SILVA, 2023).

Ariquemes, on the other hand, emerges as a medium-sized city, originating from colonization projects and a growth trajectory based on agribusiness, presenting an increasingly decentralized urban expansion and connected to the dynamics of the agricultural frontier (GOBIRA; SOUSA, 2025; DIOGO, 2024).

However, urbanization in these cities does not occur in a homogeneous way. Several studies indicate that the configuration of urban space in the Amazon occurs under the strong influence of socio-spatial inequalities, which are manifested in the segregation of social groups, in the precariousness of basic infrastructure and in the absence of public policies that account for regional specificities (PENNA; FERREIRA, 2014; SILVA et al., 2016). The urban peripheries of these municipalities are marked by an unequal distribution of essential services, such as sanitation, transportation, and urban equipment, which intensifies processes of exclusion and social vulnerability (SILVA et al., 2016). In addition, as Jacarandá (2024) points out, inequality in Amazonian cities is also expressed in violence, in an articulation between poverty, informality, and the absence of the State.

Amazonian urban expansion, especially in recent decades, has been crossed by large infrastructure projects, such as highways, hydroelectric plants, and ports, which contribute to territorial reconfiguration, changing landscapes, ways of life, and scales of space organization

(FENZL et al., 2020). The progress of these works, although often legitimized by the discourse of progress, deepens social and ecological contradictions, impacting traditional populations, intensifying deforestation and accentuating imbalances in the distribution of resources and even opportunities.

Despite the relevance of the topic, there are still few studies that address in an integrated way the processes of urbanization and socio-spatial inequality in different types of Amazonian cities. Many studies focus on capitals or isolated case studies, making it difficult to understand how territorial dynamics are articulated between municipalities with different urban functions. As Gonçalves et al. (2013) point out, understanding the process of urbanization in the Amazon requires a careful look at its multiple scales, the heterogeneity of its territories and the complex relationships between urban and rural.

In view of this, this article aims to carry out a bibliographic review on urban expansion and socio-spatial inequality in the western Amazon, focusing on the municipalities of Porto Velho, Candeias do Jamari and Ariquemes. It seeks to understand how the literature has approached these processes at different urban scales, identifying the main focuses of analysis, the existing gaps and the possibilities of discussions about the situation of urbanization in the region.

2 METHODOLOGY

This article adopts as its main approach the qualitative bibliographic review, with the objective of gathering, analyzing and discussing the scientific production on urban expansion and socio-spatial inequality in municipalities of the western Amazon, with a specific focus on Porto Velho, Candeias do Jamari and Ariquemes.

The bibliographic review comprises a systematic process of reading, selecting and interpreting academic studies and technical documents, with a view to building a theoretical and empirical panorama on the proposed theme. According to Gil (2008), literature review is an important stage for scientific research, as it allows identifying the state of the art of knowledge, understanding how themes have been addressed by different authors and recognizing gaps and possibilities for deepening.

The selection of studies for the review considered publications in the period of the last ten years (2015 - 2025), prioritizing scientific articles in indexed journals, dissertations, theses and academic works that presented an empirical or theoretical approach focused on Amazonian urbanization, the processes of urban segregation, the unequal production of

space and territorial transformations in the study region. The following inclusion criteria were used: coherence with the proposed theme, methodological clarity and direct link with the municipalities of interest or with similar dynamics in the Amazonian context. Studies that did not cover the main theme of the review, as well as opinion articles without theoretical basis, were excluded.

The databases explored were: Google Scholar and the Brazilian Digital Library of Theses and Dissertations (BDTD). Keywords such as *urban expansion*, *socio-spatial inequality*, *urbanization in the Amazon*, *Porto Velho*, *Candeias do Jamari*, *Ariquemes* and *urban segregation were used*.

The analysis of the selected material was guided by the principles of content analysis, as proposed by Bardin (2011). This technique aims at the systematization and interpretation of information in order to highlight patterns, recurrences and meanings implicit in the texts. The process involves three main stages: (1) pre-analysis, dedicated to floating reading and organizing the documents; (2) the exploration of the material, in which the cutouts and categorization of the units of meaning are carried out; and (3) the treatment of the results and interpretation, when the data are critically analyzed, seeking to understand their articulations and contributions to the object of the research.

3 RESULTS AND DISCUSSION

The bibliographic survey was carried out in two main search databases: Google Scholar and Digital Library of Theses and Dissertations (BDTD). The search on Google Scholar returned 1,174 results in all, based on combinations of keywords such as *urban expansion*, *spatial segregation*, *socio-spatial inequality*, *urbanization in the Amazon*, *Porto Velho*, *Candeias do Jamari* and *Ariquemes*. Of these, 15 studies were selected after reading the titles, abstracts and thematic relevance. In the BDTD, searches were carried out with the terms *urban expansion*, *urbanization*, *Rondônia* and *Porto Velho*, resulting in 26 works, of which 1 were selected. Thus, the final corpus of the review was composed of 16 studies analyzed, respecting the criteria of thematic relevance and focus on the target municipalities.

3.1 URBANIZATION PROCESSES IN THE WESTERN AMAZON

Urbanization in the Western Amazon is marked by specificities that differentiate it from other Brazilian urban contexts. It is a process historically linked to the expansion of the agricultural frontier, the implementation of large infrastructure projects and the role of the

State as an inducer and mediator of population occupations. In this sense, Porto Velho, Ariquemes, and Candeias do Jamari share a common trait: urban growth strongly conditioned by developmental policies and the logistics of BR-364, a territorial articulation route that crosses the three municipalities (DA COSTA SILVA, 2023).

Throughout the 1970s and 1980s, urbanization in Rondônia was driven by official colonization projects, which generated an urban configuration that was often improvised, devoid of planning and aimed at the accelerated absorption of migrants (NASCIMENTO; SILVA, 2024). In Ariquemes, for example, the expansion of the urban perimeter directly reflected the migratory flows from other regions of the country, fostering a model of dispersed urbanization centered on popular allotments (MOURA, 2017).

In Candeias do Jamari, the proximity to Porto Velho and the installation of projects linked to the energy and forestry sector contributed to the emergence of urban centers in environmentally sensitive areas, such as the Jamari National Forest (MARQUES, 2018). In these contexts, urbanization was not accompanied by a structuring public policy, generating fragmented and socially unequal territories.

Silva (2023), when analyzing data from the 2022 Census, points out that the recent population growth in Porto Velho and Ariquemes remains above the regional average, showing the continuity of urban densification in central areas and the disorderly expansion towards urban extension areas. This growth, although expected, accentuates existing vulnerabilities, such as irregular occupations, lack of sanitation and housing deficit.

3.2 SOCIO-SPATIAL INEQUALITIES AND URBAN FRAGMENTATION

Urban inequality in the Western Amazon is manifested in the spatialization of deprivation, where peripheral neighborhoods concentrate the highest rates of housing precariousness, limited access to public services, and greater environmental vulnerability (FONSECA, 2017). Socio-spatial segregation, in this context, does not occur only by income, but by a combination of historical, ethnic, and environmental factors that structure the unequal occupation of urban space.

Studies on Porto Velho show a model of a segmented city, with great contrasts between the central areas, endowed with infrastructure, and the peripheral zones, marked by self-construction and the absence of the State (DE ABREU MONTEIRO; FILE; CRUZ, 2020). Alves (2023) reinforces this fact by demonstrating that the distribution of public facilities in

Candeias do Jamari follows a logic of exclusion, directing investments to the most valued areas and leaving entire regions on the margins of the formal urbanization process.

Augusto (2017), when studying the patterns of urban mobility in Porto Velho, identifies that peripheral populations face greater difficulties in commuting, which highlights the inequality in the city's daily life. Urbanization not only reflects inequality, but also reinforces it, by limiting opportunities for integration and access to urban rights.

3.3 PUBLIC POLICIES AND URBAN PLANNING: LIMITS AND CONTRADICTIONS

A recurrent aspect in the literature on the municipalities analyzed is the insufficiency or ineffectiveness of urban planning instruments. Even in cities with approved master plans, such as Porto Velho and Ariquemes, implementation is partial and disjointed, which compromises the social function of the city and property (DE OLIVEIRA et al., 2020). According to the authors, in many cases, the plans are not updated or become hostages of local political interests, which weakens the capacity of the public power to face the challenges of unequal urbanization.

Vasconcelos and Filho (2025) noted that housing policy in Rondônia has prioritized projects under the Minha Casa Minha Vida program, which, although it has expanded access to housing, has contributed to the expansion of housing complexes in areas far from urban centers, without the proper provision of infrastructure. This pattern favors the formation of new peripheries and hinders territorial integration.

In the case of Candeias do Jamari, Oliveira (2023) points out that the absence of specific policies aimed at urban planning compromises quality of life and deepens exclusion. Institutional fragility and low local administrative capacity are also factors that limit the effectiveness of public policies and increase spatial inequality.

The urbanization of the Amazon cannot be understood without considering the socio-environmental conflicts that emerge from the overlap between the interests of urban expansion and environmental preservation. In Candeias do Jamari, for example, the expansion of illegal allotments over the Jamari Flona area has generated territorial disputes and pressure on fragile ecosystems (MARQUES, 2018; SANTOS, 2021). Such processes are often accompanied by omission by the public authorities and weakness in inspection.

Moura (2017) reports that, in Ariquemes, urbanization in valley bottom areas has caused siltation of streams and increased risk of flooding. This expansion, often informal,

disrespects environmental legislation and shows the lack of articulation between urban and environmental policies.

3.4 INSTRUMENTS OF URBAN REGULATION AND THE ROLE OF THE STATE

The literature analyzed reveals a common pattern among the municipalities of the Western Amazon: the presence of formally constituted urban legislation, but little effective in practice. Master plans, when they exist, often need to be updated, are not applied in an integrated manner with housing and environmental policies and, above all, do not have intermunicipal articulation. Oliveira (2023) emphasizes that, in Porto Velho, urban zoning and occupation guidelines rarely consider the real dynamics of the city's expansion, which contributes to urban informality and housing precariousness.

Vasconcelos and Filho (2025) point out that the deficit of technical instruments and human capital in local administrations, added to the interference of political and economic interests, compromises the regulatory capacity of the State. In this context, the city is shaped less by urban governance and more by the logic of the real estate market and by the pressure of groups organized around allotments and occupations.

The case of Ariquemes is emblematic in this sense. Studies such as those by Moura (2017) and De Oliveira et al. (2020) show that urban expansion, although accelerated, occurs spontaneously, without land planning, resulting in occupations of environmentally sensitive areas, low infrastructure supply, and future difficulties in regularization. Therefore, the absence of a policy for the use and subdivision of land is both a cause and a consequence of the fragmentation of urban space.

3.5 INTERMUNICIPAL DYNAMICS AND REGIONAL URBAN NETWORK

Although regional studies on the Amazon often emphasize local aspects, the integrated analysis between the municipalities of Porto Velho, Ariquemes and Candeias do Jamari is scarce. However, Silva (2023) highlights the importance of understanding BR-364 not only as a route for the flow of production and mobility, but as an axis that can structure and influence territorial relations, configuring an urban network with material and symbolic flows.

In this context, Porto Velho exerts a functional centrality over Candeias do Jamari, which depends on the capital for access to medium and high complexity public services, economic activities and cultural equipment. Ariquemes, on the other hand, functions as an

intermediate regional hub, with relative autonomy, but still subordinated to the political and economic guidelines of the state capital.

This interdependence, according to Nascimento and Silva (2024), is crossed by historical inequalities, which are reflected in the investment capacity of each municipality, in the coverage of public services and in the presence of the State. The absence of articulation between municipal administrations compromises an integrated territorial approach and favors the reproduction of spatial inequalities within the urban network.

Silva (2023), when analyzing the data from the 2022 Census, reinforces this finding by showing the uneven growth of the population between municipalities, with faster expansion in peri-urban areas and on the fringes of Porto Velho and Ariquemes, which requires joint planning to face common challenges, such as transportation, housing, and basic infrastructure.

4 CONCLUSION

The literature review carried out allows us to affirm that the urbanization processes in Porto Velho, Ariquemes and Candeias do Jamari are part of a broader logic of occupation of the Western Amazon, strongly marked by contradictions between urban growth and the absence of structuring policies. The set of studies analyzed shows that urban expansion in the region is accompanied by deep socio-spatial inequalities, which are manifested both in the precariousness of urban infrastructure and in the segregation of the most vulnerable social groups.

The literature also points out that, despite the existence of legal instruments such as master plans and land use laws, there is a significant gap between the norm and its concrete application. Urban governance is limited by factors such as low institutional capacity, lack of intermunicipal articulation, and the influence of private interests in the organization of the territory. As a consequence, urban space develops in a fragmented way, reproducing and deepening historical inequalities.

Finally, it is found that the academic production on the municipalities studied, although growing, still lacks more integrated and comparative approaches. Most of the work focuses on isolated case studies. Thus, this review reinforces the relevance of future investigations that consider the Western Amazon as a complex field of territorial disputes, urban challenges, and opportunities for the construction of fairer and more sustainable cities.

REFERENCES

Akinade, O. O., Oyedele, L. O., Ajayi, A. O., Bilal, M., Alaka, H. A., & Owolabi, H. A. (2020). Machine learning for digital construction: A review. Automation in Construction, 119, Article 103331. https://doi.org/10.1016/j.autcon.2020.103331

Alves, R. F. de A. (2023). Arquitetura habitacional: Estudo preliminar para viabilidade da habitação de interesse social no município de Porto Velho-RO. Revista Ibero-Americana de Humanidades, Ciência e Educação - REASE, 9(5), 3194–3228.

Antonio, S. L. (2025). Technological innovations and geomechanical challenges in Midland Basin drilling. Brazilian Journal of Development, 11(3), Article e78097. https://doi.org/10.34117/bjdv11n3-005

Arayici, Y., Coates, P., Koskela, L., Kagioglou, M., Usher, C., & O'Reilly, K. (2017). Technology adoption in the BIM implementation for lean architectural practice. Automation in Construction, 20(2), 189–195.

Augusto, M. N. (2017). Aplicação de análise fatorial no estudo de vulnerabilidade socioespacial na cidade de Porto Velho-RO [Master's dissertation, Universidade Federal de Rondônia]. Programa de Pós-Graduação Mestrado e Doutorado em Geografia, UNIR.

Azhar, S. (2011). Building information modeling (BIM): Trends, benefits, risks, and challenges for the AEC industry. Leadership and Management in Engineering, 11(3), 241–252.

Aziz, Z., & Hafez, S. (2013). Construction monitoring using smartphone technology. Automation in Construction, 36, 17–27.

Badii, C., Bellini, P., Cenni, D., & Difino, A. (2020). A cloud-based system for smart construction site monitoring using IoT and AI technologies. Automation in Construction, 119, Article 103343. https://doi.org/10.1016/j.autcon.2020.103343

Bardin, L. (2011). Análise de conteúdo (1st rev. ed.). Edições 70.

Cheng, J. C. P., Teizer, J., Migliaccio, G. C., & Gatti, U. C. (2016). Automated workface monitoring using BIM and computer vision for labor productivity estimation. Automation in Construction, 67, 31–44.

da Costa Silva, R. G. (2023). Dinâmica populacional e recentralização urbana em Rondônia: Análise a partir do Censo Demográfico 2022. Acta Geográfica, 17(44), 1–21.

de Abreu Monteiro, M., Lima, J. J. F., & Cruz, A. G. (2020). Condição de moradia dos domicílios urbanos nos municípios da Amazônia Legal segundo redes infraestruturais (2000 e 2010). Novos Cadernos NAEA, 23(2).

de Oliveira, O. F., et al. (2018). Programa território da cidadania: Políticas públicas para desenvolvimento rural em Rondônia. Revista Brasileira de Gestão e Desenvolvimento Regional, 14(2).

Delci, C. A. M. (2025). The effectiveness of Last Planner System (LPS) in infrastructure project management. Revista Sistemática, 15(2), 133–139. https://doi.org/10.56238/rcsv15n2-009

Diogo, L. T. M. (2024). Amazônia Ocidental: Uma análise da expansão urbana nas regiões de fronteira agrícola [Undergraduate thesis, Universidade Federal de Rondônia]. Curso de Geografia, UNIR.

Ding, L., Zhong, B., Wu, S., Luo, H., & Luo, L. (2022). Smart construction: From smart technologies to systemic changes. Automation in Construction, 133, Article 104007. https://doi.org/10.1016/j.autcon.2021.104007

Elghaish, F., Hamzeh, F., & AbouRizk, S. (2019). Cloud-based mobile construction management systems: Enablers and challenges. Journal of Construction Engineering and Management, 145(9), Article 04019063. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001683

Fenzl, N., et al. (2020). Os grandes projetos e o processo de urbanização da Amazônia brasileira. Sociedade & Natureza, 32(1), 81–100. https://doi.org/10.14393/SN-v32n1-2020-3

Filho, W. L. R. (2025). The role of AI in enhancing identity and access management systems. International Seven Journal of Multidisciplinary, 1(2). https://doi.org/10.56238/isevmjv1n2-011

Filho, W. L. R. (2025). The role of zero trust architecture in modern cybersecurity: Integration with IAM and emerging technologies. Brazilian Journal of Development, 11(1), Article e76836. https://doi.org/10.34117/bjdv11n1-060

Flyvbjerg, B. (2014). What you should know about megaprojects and why: An overview. Project Management Journal, 45(2), 6–19. https://doi.org/10.1002/pmj.21409

Flyvbjerg, B. (Ed.). (2017). The Oxford handbook of megaproject management. Oxford University Press.

Fonseca, D. H. C. (2017). A cidade sem terras: Configuração e expansão da estrutura fundiária de Porto Velho, sob a ótica da urbanização informal e espontânea [Master's dissertation, Universidade Federal de Pernambuco]. Programa de Pós-Graduação em Desenvolvimento Urbano.

Freitas, G. B., Rabelo, E. M., & Pessoa, E. G. (2023). Projeto modular com reaproveitamento de container marítimo. Brazilian Journal of Development, 9(10), 28303–28339. https://doi.org/10.34117/bjdv9n10-057

Garcia, A. G. (2025). The impact of sustainable practices on employee well-being and organizational success. Brazilian Journal of Development, 11(3), Article e78599. https://doi.org/10.34117/bjdv11n3-054

Gil, A. C. (2008). Métodos e técnicas de pesquisa social (6th ed.). Atlas.

Gobira, G., & Sousa, I. (2025). Dinâmicas econômicas e crescimento urbano de Ariquemes-RO. Revista Aracê, 7(3), 10601–10613.

Goh, Y. M., & Loosemore, M. (2017). Barriers to implementing mobile technologies for construction health and safety. Safety Science, 92, 102–111.

Gonçalves, C. A. B., et al. (2013). Porto Velho na configuração urbana da Amazônia Ocidental. Revista Geográfica da Amazônia, 7(1), 35–49.

International Labour Organization. (2019). Safety and health at work. https://www.ilo.org/global/topics/safety-and-health-at-work/lang--en/index.htm

Kamat, V. R., & Martinez, J. C. (2001). Improving productivity of construction field workers with handheld computers: A case study. Journal of Construction Engineering and Management, 127(6), 491–498.

Li, H., Guo, H. L., Skitmore, M., Huang, T., & Chan, K. Y. (2018). Rethinking project management and exploring virtual design and construction as a potential solution. Automation in Construction, 87, 120–132. https://doi.org/10.1016/j.autcon.2017.12.015

Lu, W., Xue, F., & Zhao, R. (2020). Digital twin-enabled construction: Historical development, current status and future research directions. Automation in Construction, 112, Article 103122. https://doi.org/10.1016/j.autcon.2020.103122

Marques, R. D. (2018). A dinâmica da malária urbana em Porto Velho (RO) no período de 2005 a 2015 [Master's dissertation, Escola Nacional de Saúde Pública Sérgio Arouca, Fundação Oswaldo Cruz]. Programa de Pós-Graduação em Saúde Pública.

Moreira, C. A. (2025). Digital monitoring of heavy equipment: Advancing cost optimization and operational efficiency. Brazilian Journal of Development, 11(2), Article e77294. https://doi.org/10.34117/bjdv11n2-011

Moura, G. G. M. (2017). Manejo de mundos e gerenciamento costeiro na Amazônia: Reflexões a partir de um diálogo entre etnooceanografia e etnodesenvolvimento. In W. de M. Costa & J. M. Lopes (Eds.), Geografia e Amazônia: Entre debates e reflexões (pp. 157–174). EDUFRO.

Nascimento, C. P., & Silva, M. (2024). A cidade de Porto Velho e as transformações no espaço urbano: Uma análise a partir da sua formação socioespacial. Ateliê Geográfico, 18(2), 161–186.

Oliveira, C. E. C. de. (2025). Gentrification, urban revitalization, and social equity: Challenges and solutions. Brazilian Journal of Development, 11(2), Article e77293. https://doi.org/10.34117/bjdv11n2-010

Oliveira, H. de S. N. (2023). Implantação de ilhas digitais em projetos de cidades inteligentes: Uma inclusão tecnológica no complexo da inclusão social em Ariquemes/RO. Revista Foco, 16(6), Article e2178. https://doi.org/10.54751/Revistafoco.v16n6-003

Park, M., Peña-Mora, F., & Lee, S. (2011). Visualization techniques for construction management data. Automation in Construction, 20(7), 845–860.

Penna, F., & Ferreira, R. (2014). Desigualdades socioespaciais e fragmentação urbana na Amazônia brasileira. Revista Brasileira de Estudos Urbanos e Regionais, 16(2), 33–50.

Pessoa, E. G. (2024). Pavimentos permeáveis uma solução sustentável. Revista Sistemática, 14(3), 594–599. https://doi.org/10.56238/rcsv14n3-012

Pessoa, E. G. (2025). Optimizing helical pile foundations: A comprehensive study on displaced soil volume and group behavior. Brazilian Journal of Development, 11(4), Article e79278. https://doi.org/10.34117/bjdv11n4-047

Pessoa, E. G. (2025). Utilizing recycled construction and demolition waste in permeable pavements for sustainable urban infrastructure. Brazilian Journal of Development, 11(4), Article e79277. https://doi.org/10.34117/bjdv11n4-046

Pessoa, E. G., & Freitas, G. B. (2022). Análise comparativa entre resultados teóricos da deflexão de uma laje plana com carga distribuída pelo método de equação de diferencial de Lagrange por série de Fourier dupla e modelagem numérica pelo software SAP2000. Revistaft, 26(111), 43. https://doi.org/10.5281/zenodo.10019943

Pessoa, E. G., & Freitas, G. B. (2022). Análise de custo de pavimentos permeáveis em bloco de concreto utilizando BIM (Building Information Modeling). Revistaft, 26(111), 86. https://doi.org/10.5281/zenodo.10022486

Pessoa, E. G., Benittez, G. S. P. A., Oliveira, N. P. de, & Leite, V. B. F. (2022). Análise comparativa entre resultados experimentais e teóricos de uma estaca com carga horizontal aplicada no topo. Revistaft, 27(119), 67. https://doi.org/10.5281/zenodo.7626667

Pessoa, E. G., Feitosa, L. M., Padua, V. P., & Pereira, A. G. (2023). Estudo dos recalques primários em um aterro executado sobre a argila mole do Sarapuí. Brazilian Journal of Development, 9(10), 28352–28375. https://doi.org/10.34117/bjdv9n10-059

Pessoa, E. G., Feitosa, L. M., Pereira, A. G., & Padua, V. P. (2023). Efeitos de espécies de alna eficiência de coagulação, Al residual e propriedade dos flocos no tratamento de águas superficiais. Brazilian Journal of Health Review, 6(5), 24814–24826. https://doi.org/10.34119/bjhrv6n5-523

Rodrigues, I. (2025). Operations management in multicultural environments: Challenges and solutions in transnational mergers and acquisitions. Brazilian Journal of Development, 11(5), Article e80138. https://doi.org/10.34117/bjdv11n5-103

Sacks, R., Koskela, L., Dave, B. A., & Owen, R. (2013). Interaction of lean and building information modeling in construction. Journal of Construction Engineering and Management, 136(9), 968–980.

Santos, H., & Pessoa, E. G. (2024). Impacts of digitalization on the efficiency and quality of public services: A comprehensive analysis. Lumen et Virtus, 15(40), 4409–4414. https://doi.org/10.56238/levv15n40-024

Santos, S. C. dos, Guimarães, S. C. P., & Lira, H. M. de. (2021). Alteração da paisagem do município de Candeias do Jamari em Rondônia: Uma análise temporal dos anos de 2007 a 2020. Confins. Revue franco-brésilienne de géographie/Revista franco-brasilera de geografia, (51). https://doi.org/10.4000/confins.37307

Santos, S. M. dos, et al. (2016). Amazônia urbana: Exclusão e (re)produção da pobreza em Porto Velho. Revista da ABET, 15(2), 73–98.

Silva, J. F. (2024). Enhancing cybersecurity: A comprehensive approach to addressing the growing threat of cybercrime. Revista Sistemática, 14(5), 1199–1203. https://doi.org/10.56238/rcsv14n5-009

Silva, J. F. (2024). Sensory-focused footwear design: Merging art and well-being for individuals with autism. International Seven Journal of Multidisciplinary, 1(1). https://doi.org/10.56238/isevmjv1n1-016

Silva, M. C. da, et al. (2016). Segregação socioespacial nas cidades médias da Amazônia brasileira: Um estudo comparado. Cadernos Metrópole, 18(36), 389–412. https://doi.org/10.1590/2236-9996.2016-3605

Silva, R. G. da C. (2023). O Brasil e Rondônia no censo demográfico 2022: Apontamentos iniciais. Confins. Revue franco-brésilienne de géographie/Revista franco-brasilera de geografia, (61). https://doi.org/10.4000/confins.50990

Souza, R. M. S., & Maniesi, V. (2017). A estruturação de lugares intraurbanos e a vulnerabilidade social de Porto Velho, Rondônia. Caminhos de Geografia, 18(63), 30–56.

Tamboril, F. A. B., & Silva, R. G. da C. (2016). A cidade de Porto Velho e a questão fundiária. In Anais do XVIII Encontro Nacional de Geógrafos. São Luís.

Teizer, J., & Cheng, T. (2015). Wearable safety technology for workforce risk reduction. Construction Research Congress 2015, 2991–2999. https://doi.org/10.1061/9780784479360.294

Turatti, R. C. (2025). Application of artificial intelligence in forecasting consumer behavior and trends in e-commerce. Brazilian Journal of Development, 11(3), Article e78442. https://doi.org/10.34117/bjdv11n3-039

Vasconcelos, B. M. N., & de São Pedro Filho, F. (2025). Gentrificação na Amazônia: Uma sociocrítica das assimetrias na gestão de políticas públicas em Porto Velho, Rondônia. Revista de Gestão e Secretariado, 16(5), Article e4923. https://doi.org/10.7769/gesec.v16i5.4923

Venturini, R. E. (2025). Technological innovations in agriculture: The application of blockchain and artificial intelligence for grain traceability and protection. Brazilian Journal of Development, 11(3), Article e78100. https://doi.org/10.34117/bjdv11n3-007

Wang, X., Love, P. E. D., Kim, M. J., Park, C.-S., Sing, C.-P., & Hou, L. (2017). Integrating BIM and mobile technology for construction project management. Automation in Construction, 69, 44–53.

Zhang, C., Wu, I.-C., & Teizer, J. (2019). Data-driven productivity monitoring using IoT and BIM. Journal of Construction Engineering and Management, 145(12), Article 04019079. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001721

Zhang, S., Teizer, J., Lee, J.-K., Eastman, C. M., & Venugopal, M. (2021). Building information modeling (BIM) and safety: Automatic safety checking of construction models and schedules. Automation in Construction, 120, Article 103350. https://doi.org/10.1016/j.autcon.2020.103350