

The Role of Municipal Recycling Project in Supporting Cooperatives: Sustainability and Social Inclusion in Apucarana-PR

Sayonara Doraci da Silva^a, Fabricio Martins Lacerda^b, Cristina Dai Pra Martens^c

^aUnespar, Brazil, sayonaradoracisilva@gmail.com

^bUnespar, Brazil, fabriciomlacerda@gmail.com¹

^cUninove, Brazil, cristinadpmartens@gmail.com

ABSTRACT

Recycling cooperatives play a crucial role in environmental sustainability by reducing solid waste, promoting the recycling and reuse of materials, and fostering social inclusion. This study aims to investigate the role of a municipal recycling project in supporting cooperatives and fostering sustainability in Apucarana-PR. The research adopted a qualitative approach, combining bibliographic review and semi-structured interviews with key stakeholders, including representatives from the cooperative and the municipal government. The findings reveal that sustainability projects enhance the circular economy by increasing the demand for recyclable materials and generating employment for cooperative members. However, challenges persist, such as limited infrastructure, financial constraints, and the need for stronger public policies to support recycling initiatives. The theoretical contributions of this study provide insights into how municipal partnerships can effectively integrate cooperatives into sustainable waste management systems. The social contributions emphasize the role of cooperatives in providing dignified work opportunities and raising public awareness about responsible waste disposal. This study highlights the importance of municipal support in overcoming operational barriers, strengthening cooperatives, and advancing local sustainability efforts. Future research should explore the long-term socio-economic impacts of cooperative-led recycling programs and the effectiveness of public-private partnerships in fostering circular economy practices. The relevance of this study lies in its analysis of the challenges and opportunities in implementing these projects within a social and environmental context.

Keywords: Recycling, Cooperative, Sustainability, Social Inclusion, Municipal Project

INTRODUCTION

Waste recycling is considered a great source of energy savings and promotes CO² recovery. In addition, it generates jobs and promotes the income of many families. The paper recycling rate in Brazil, for example, is one of the highest in the world. In 2020, 66.7% of the paper produced in the country

¹ Corresponding author. Email addresses: fabriciomlacerda@gmail.com. We, authors of the current research paper, certify that the paper is an outcome of our independent and original work. We have duly acknowledged all the sources from which the ideas and extracts have been taken and we are responsible for any errors that may be discovered. We thank the editor of CYRUS Global Business Perspectives (CGBP), and anonymous reviewers for their careful reading of our manuscript and their many insightful comments and suggestions.

(about 5.02 million tons) returned to the production process (IBÁ, 2023). Currently, Brazil ranks fourth among the largest producers of plastic waste in the world, preceded by the United States (70.8 million tons), China (54.7 million tons) and India (19.3 million tons). Each Brazilian citizen generates about one kilogram of plastic waste per week, which places Brazil in second place in per capita waste production, occupying only one position behind the United States (Bolson et al., 2023; Gonçalves-Dias et al., 2023).

Recycling is considered a fundamental process for the transition to a Circular Economy, and it can make an important contribution to the mitigation of Greenhouse Gases (GHG), to the promotion of a more sustainable energy transition in many industrial sectors. Regarding Brazilian objectives in relation to the Sustainable Development Goals (SDGs), despite the mandatory implementation of selective collection systems for Urban Solid Waste (MSW) in municipalities by the National Solid Waste Policy (NSWP), only in 27.5% of the population in the cities has a door-to-door selective collection service (MC, 2023). Although this value is low, this is the most suitable operational model to increase MSW recycling rates (Eunomia, 2024; Cempre, 2023).

In this study, the importance of recycling cooperatives in the search for environmental sustainability and the various challenges and opportunities that are involved in the implementation of these kinds of projects will be discussed. In addition, we present some explanation about how this relationship occurs in the social and environmental sphere generated by these actions, which govern the performance of these cooperatives and the municipal sector.

The contextualization of sustainable work is extremely important for an understanding of the importance and impact of the municipal project on recycling cooperatives. A set of relevant information and data about the local reality will be presented, emphasizing the importance of the recycling cooperative for the municipality and emphasizing the importance of the partnership between the public sector and the cooperative for the success and effectiveness of these cooperation projects. Aspects such as some initiatives and concrete actions that strengthen this partnership will be addressed, affirming the need for joint and collaborative work for the effective advancement and sustainable development of Apucarana (Miquelim & Oliveira, 2019; Vieira, 2024).

In this context, this study aims to investigate the role of a municipal recycling project in supporting cooperatives and fostering sustainability in Apucarana-PR. Aspects involved in this process will be addressed, taking into account the fundamental and transformative role of the municipal project as an agent of sustainable development. In short, this study aims to present a substantial view on the management of municipal projects in recycling cooperatives, offering a compendium of factors acting under the proposed theme (Crovador, 2022).

To provide a comprehensive analysis, this study is structured as follows: Section 2 presents the

theoretical background, discussing the role of recycling cooperatives in environmental sustainability and their alignment with the Sustainable Development Goals (SDGs). Section 3 details the methodology adopted, including the qualitative approach and data collection methods used to analyze the cooperative-municipality relationship. Section 4 presents and discusses the results, highlighting the challenges, opportunities, and social and environmental impacts of recycling cooperatives in Apucarana. Finally, Section 5 provides the conclusions, summarizing the main findings and discussing implications for public policies, sustainability strategies, and future research directions.

THEORETICAL BACKGROUND

Recycling cooperatives play a key role in environmental sustainability, as they significantly contribute to reducing the volume of solid waste sent to landfills. Consequently, these organizations help minimize the environmental impact associated with waste disposal. Additionally, it is important to highlight that cooperatives actively promote selective waste collection, the careful separation of recyclable materials, and their subsequent recycling, granting these materials a new life and preventing unnecessary waste (Horizonte Ambiental, 2018).

Cooperatives play a crucial role in advancing the Sustainable Development Goals (SDGs) in vulnerable urban environments by providing opportunities for decent work, economic inclusion, and access to essential services such as education and healthcare. Aligned with the values and objectives of the SDGs, they contribute to strengthening local economies, reducing inequalities, and improving quality of life (Torres et al., 2024).

These actions by recycling cooperatives not only help preserve the finite natural resources we have available but also contribute to the reduction of pollution caused by the production of new materials. Therefore, by recycling and reusing existing resources, these cooperatives become direct agents in the fight against climate change and environmental degradation, helping to minimize negative impacts on the ecosystem (Araújo & Silva, 2011). Recycling cooperatives fit into this inclusive context, as their production process involves the correct disposal of solid waste, inclusive management, and job and income generation. In addition, recycling cooperatives have become more relevant with the NSWP, specified by Law No. 12,305 (2010), which establishes socio-environmental policies that establish the correct disposal of solid waste is an obligation shared by all members of the chain itself.

In addition to the environmental benefits, recycling cooperatives also generate several economic opportunities. We can cite self-management, which is achieved through continuous practices, subject to advances and setbacks from the generation of own subsidies to the promotion of sustainability (Lechat & Barcelos, 2008). Furthermore, by promoting jobs in the collection and sorting of recyclable materials, these cooperatives provide livelihoods for many families, thus contributing to the socioeconomic development of the communities where they operate. This job

creation is essential for promoting a more sustainable circular economy, which seeks to reduce dependence on natural resources and establish more conscious consumption and production practices (MC, 2023).

The importance of recycling cooperatives for environmental sustainability is linked to their comprehensive and multifaceted performance in reducing the negative environmental impact of improper waste disposal. Through the efficient and responsible recycling of diverse materials, such as paper, plastic, glass and metal, cooperatives play a vital role in preserving and conserving our planet's precious natural resources (Ribeiro et al., 2014).

In the same way, by reusing and transforming these materials into new products, cooperatives contribute to extending the life cycle of these resources, thus reducing the need to produce new items and the associated environmental impacts (Carvalho, 2023). Highlighting the importance of recycling, encouraging the reduction of unnecessary consumption, promoting reuse and teaching correct disposal techniques, partnerships with local municipalities create a collective awareness in relation to the protection of the environment.

In this way, there is an awareness of citizens to become agents of transformation and to adopt sustainable practices in their daily lives. Efficient recycling of the materials mentioned above results in a decrease in energy demand during the production process, since recycling tends to be less energy-intensive compared to production from virgin raw materials (Carvalho, 2023; Lima, 2024; Yoshiyasse et al., 2017). Therefore, recycling cooperatives have an important role in promoting sustainable practices and preserving the environment.

We point out that its positive impact is important, both in terms of waste reduction, rational consumption of natural resources, pollution reduction, and job creation (Bazanini et al, 2021; Sanitary & Junior, 2024; Saueressig et al., 2021; Silva & Mello, 2024). Additionally, municipal projects in recycling cooperatives can bring several social and economic impacts to the local community. In economic terms, job creation is one of the main benefits, as recycling cooperatives usually hire more fragile local residents, contributing to the economic development of the region. In addition, the generation of income for waste pickers and employees of cooperatives is also a significant economic impact, as it allows the improvement of the living conditions of these people and their families (Souza et al, 2012).

Sustainable actions in this bias place the environment at the center of economic activity, valuing the available resources, while strengthening economic and social relations based on the structuring, classification, storage and proper disposal of waste (Senger et al., 2010). On the other hand, the emergence of new business opportunities and the diversification of the local economy are additional benefits brought by these projects.

In social terms, awareness of the importance of recycling and the preservation of the environment are one of the impacts, since cooperatives usually promote environmental education and community awareness actions (Souza et al, 2012). These actions include awareness campaigns, lectures in schools, distribution of informational materials, participation in community events, and training programs. These initiatives aim not only to inform people about the importance of recycling, but also to actively engage them in the environmental cause (Sema, 2024). In this way, municipal projects in recycling cooperatives can strengthen community ties, promoting greater cooperation and solidarity among community members.

This collective awareness of sustainability is key to building a more balanced and resilient society. Regarding social impacts, recycling cooperatives can promote social inclusion, offering job opportunities and personal development for people who face difficulties in the traditional labor market (Souza, Silva & Barbosa, 2014). We stress that frequently recyclable material collectors are in a situation of social vulnerability, and working in cooperatives not only provides them with a source of income but also strengthens their self-esteem and sense of belonging to the community.

The economic benefits for the local community arising from municipal projects in recycling cooperatives are expressive. The generation of direct and indirect jobs, the improvement of the family income of waste pickers and employees, the expansion of the recyclables market and the reduction of the costs of final disposal of solid waste are some of the main economic gains. Furthermore, the performance of cooperatives can generate revenue for the municipality through cooperation agreements, tax incentives and external fundraising. These economic benefits contribute significantly to local development, the reduction of social inequality, and the promotion of economic sustainability in the community (Souza et al., 2012; Batista et al., 2015; Silva & Sauka, 2024).

In summary, municipal projects in recycling cooperatives have the potential to bring a range of positive impacts to the local community. These benefits can be evidenced by creating jobs, generating income, promoting environmental and social awareness, improving quality of life and social inclusion. Thus, projects related to recycling cooperatives can contribute to sustainable development and the construction of a more just, supportive and environmentally responsible community.

MATERIALS AND METHODS

To achieve this, the study adopted a qualitative and descriptive approach (Gil, 2011), focusing on the characteristics of specific groups. The research was conducted through interviews and document analysis (Dias & Silva, 2010) to understand behaviors in different contexts. The Cooperative of Collectors and Separators of Recyclable Materials of Apucarana (COCAP) was selected due to its regional prominence in the recycling sector. Additionally, a bibliographic review was conducted to examine existing literature on sustainable practices, the role of municipalities,

and the contribution of cooperatives to this process.

The study used a qualitative approach to analyze the implementation, impact and challenges faced in municipal projects aimed at recycling cooperatives and how this relationship can be beneficial from the perspective of social inclusion and sustainable development. The methodology included a bibliographic review based on the existing literature on sustainable practices and the role of municipalities in this locus, the role played by cooperatives and the importance of such a relationship.

In order to bring relevant data about the relationship between COCAP and the municipal government of Apucarana, interviews were conducted with the Secretary of the Environment (SEMA) and the current manager of the cooperative. The interviews followed an informal and open-ended format, allowing flexibility in the discussions and revealing key insights related to the cooperation between the municipality and COCAP. The interview with the Secretary of the Environment addressed topics such as the main challenges in implementing sustainability projects, legal and regulatory frameworks, community participation, and waste management policies (see Table 1 for a summary of the responses).

The interview with the secretary of the environment was held in person, at the SEMA secretary with an open and informal conversation, which provided relevant data on the relationship between the municipal government of Apucarana and COCAP. Topics were addressed such as how the mutually beneficial relationship between both parties occurs, whether there is a mandatory law for this partnership to occur, the benefits and challenges for social inclusion and sustainable development. The interview with the manager of the cooperative was informal and open, questioning facts and data related to the emergence of the cooperative in question, its achievements, challenges and asking about its importance through this scenario proposed by the above. The data from the interviews were analyzed in order to characterize the activities carried out by COCAP, considering the environmental management project of the municipality of Apucarana.

RESULTS PRESENTATION AND DISCUSSION

The Cooperative of Collectors and Separators of Recyclable Materials of Apucarana has a history marked by perseverance and dedication to sustainability and social inclusion. Founded in 1999 on the initiative of the local Catholic Church, the cooperative emerged as a response to the theme of that year's Fraternity Campaign: "No work... Why?". The objective was to offer employment opportunities and dignity to recyclable material collectors who, before the formation of the cooperative, worked in a precarious way with individual carts, collecting in open dumps, often incinerating waste.

Currently, the cooperative collects approximately 2,500 tons of waste per month from landfills, of

which 50% is recyclable and 35% is utilizable. The land on which the cooperative operates, situated in Apucarana, was acquired through a private-sector initiative. Local entrepreneurs contributed to the donation at the site, thereby establishing the cooperative's operational base.

However, after its creation, the cooperative faced a period of corruption, which led to the intervention of the city hall and the Public Prosecutor's Office to guarantee the rights of workers and solve problems of default. During this process, the leaders involved were removed and an intervenor was appointed to deal with bureaucratic issues. It is worth noting that, despite the challenges, the president of the cooperative is always a cooperative member.

The image below (Figure 1) shows the entrance to the Cooperative, symbolizing the dedication and joint effort of the community to promote sustainability and social inclusion through recycling.



Figure 1. COCAP

Currently, COCAP is directed by an intervenor appointed by the Public Prosecutor's Office, who is a specialist in agroecology and a technician in agriculture. Until then, this professional actively directed the Family Farming Program, where he was responsible for the management of family farming. He took over in 2016, where he made improvements and has led COCAP to the extent possible since then. During an interview, the intervenor states that: “(...) *I managed to grow as a human being, I thought I knew the history of human beings, of people. He was used to dealing with the rural environment, but not the urban one! I am moved by the love of the cooperative! (...) At first, they opened the lunchbox, there was only rice, there was no food. From the moment there was food, the absences decreased (...)*”.

At present, COCAP maintains its own cafeteria, current dividends, and up-to-date deposits of its

contribution from the National Institute of Social Security. The Cooperative assists employees in this collection process, as many individuals lack the necessary understanding due to limited educational backgrounds. The Cooperative's efforts to assist employees with their social security contributions demonstrate its commitment to supporting its workforce beyond just providing employment. This assistance is particularly valuable given the challenges many employees face due to limited educational backgrounds. By offering this support, COCAP not only helps ensure its employees' financial security but also contributes to their overall well-being and understanding of important administrative processes.

At this moment, the Cooperative of Collectors and Separators of Recyclable Materials of Apucarana (COCAP) is directed by an intervenor appointed by the Public Prosecutor's Office. This intervenor is a specialist in agroecology and a technician in agriculture. Before taking over COCAP, he actively coordinated the Family Farming Program, being responsible for its management. He took over the leadership of the cooperative in 2016, implementing several improvements and leading COCAP within the possibilities since then. In an interview, the intervenor shared his experiences: *“I managed to grow as a human being, I thought I knew the history of being human, of people. He was used to dealing with the rural environment, but not the urban one! I am moved by the love of the cooperative! At first, they opened the lunchbox, there was only rice, there was no food. From the moment there was food, the absences decreased”*.

Currently, the COCAP has its own cafeteria and continues its dividends. The cooperative also ensures regular deposits for its contribution to the National Institute of Social Security. Owing to the low education of many cooperative members, the cooperative assists in the process of collecting these contributions, ensuring that all employees understand and comply with their social security obligations.

COCAP's history is marked by challenges and achievements, with a constant focus on sustainability and social inclusion. The dedication of the intervenor and the collaboration of the cooperative members have been fundamental to the success and continuous growth of the cooperative. Together, they work to ensure better working conditions, social inclusion and protection of the environment through recycling. The cooperative's commitment to these principles

has led to significant improvements in the lives of its members and the broader community. COCAP's innovative approach to waste management has not only created employment opportunities but also raised awareness about environmental issues in the region. As the cooperative continues to evolve, it faces new challenges and opportunities, including expanding its operations and adapting to changing market demands for recycled materials.

The collaborative partnership between the Municipality of Apucarana and COCAP has proven to be extremely productive and beneficial for the local community. Since the beginning of this partnership, important transformations have been observed, creating a positive and lasting impact in the region. One of the main achievements of this partnership was the significant reduction in the amount of solid waste sent to landfills. Consequently, thanks to joint initiatives, such as awareness campaigns and encouraging waste separation, it has been possible to boost the implementation of effective recycling programs. These programs directly involve local residents, bringing direct and indirect benefits to the community in terms of environmental conservation and quality of life.

Awareness of the importance of waste separation and recycling has reached satisfactory levels among the population. Through environmental education programs and awareness-raising actions, citizens are increasingly engaged in sustainable practices, contributing to a cleaner and healthier environment. This positive change in behavior is leaving an important legacy for future generations, ensuring a continuous improvement in the quality of life and the preservation of natural resources. The results achieved so far prove the direct and significant impact of this partnership on the community of Apucarana.

Following the contextualization of COCAP's activities and physical space, Table 1 presents a summary of the key points from the interview conducted with the Secretary of the Environment of Apucarana.

Table 1. Interview about the relationship of the municipal government of Apucarana-PR with recycling

Question	Response from the Secretary of the Environment
1. What are the main challenges faced by the city when implementing its sustainable projects?	<i>Many citizens still do not have the habit of separating garbage and do not even know the benefits of recycling. The population needs to be constantly informed about the importance of recycling, the materials that can be recycled and how to separate correctly.</i>
2. How do sustainability projects impact citizens' quality of life?	<i>It reduces the volume of waste sent to landfills, generates jobs and saves natural resources. By promoting more sustainable practices, these projects contribute to a healthier environment, a stronger economy, and a fairer and more conscious society.</i>
3. How is community participation and awareness promoted in sustainability projects?	<i>Carrying out educational campaigns to inform the population about the importance of recycling. There is a project of door-to-door selective collection, facilitating the participation of citizens, strengthening the partnership with COCAP in order to ensure the proper disposal of recyclable materials. The integration of environmental education in schools and other spaces in the city. And an efficient inspection of compliance with environmental laws.</i>
4. What are the legal and regulatory instruments that guide sustainable projects in the municipal government of Apucarana?	<i>The National Solid Waste Policy Law that regulates the integrated and adequate management of solid waste, encouraging recycling and reducing waste generation. And the Reverse Logistics law, which establishes shared responsibility between manufacturers, importers, distributors, traders, consumers and the government regarding the collection and proper final disposal of products and packaging after use by the consumer.</i>
5. How does the city government deal with waste management and conscious disposal?	<i>Apucarana has a PGIRS (Integrated Solid Waste Management Plan), a document that details the actions and goals for the proper management of solid waste in the municipality.</i>

Source: research data, 2025.

The role of the municipal project in the management of recycling cooperatives in Apucarana is of paramount importance for the sustainable development of the region. Through consistent support, as well as providing technical and logistical support, the project effectively seeks to strengthen the local cooperative, fostering social inclusion and boosting the creation of jobs and income for cooperative members. In addition, the municipal project has as its main objective to promote an even more comprehensive environmental awareness, encouraging the practice of selective collection and contributing to the improvement of the quality of life of the entire community in question.

The objectives of the municipal project in Apucarana include: significantly improving the partnership with the recycling cooperative, aiming at efficiency and effectiveness in internal and external processes. It seeks to promote environmental education and awareness of the population, with comprehensive and high-impact educational actions and programs. To this end, innovative and creative communication strategies were developed in the municipal school network, aiming to sensitize and engage the community in relation to the importance of recycling and preservation of the environment. Successful public-private partnerships were established, which enabled considerable investments in sustainable infrastructure and technologies, thus ensuring greater efficiency and use of available resources.

The methodology adopted by the project involves participatory diagnoses, through a holistic and integrated approach, the municipal project aims to achieve positive and sustainable results in the management of recycling cooperatives. Thus, it seeks not only the improvement of operational processes, but also the appreciation of cooperative members and the promotion of a sustainable mentality, which lasts for many years and contributes to the preservation of the environment and local socioeconomic development.

With the implementation of strategic actions and a participatory management model, the municipal project aims to ensure the operational efficiency of cooperatives, ensuring the proper disposal of solid waste and, at the same time, promoting the generation of economic and social value for all those involved in this process. This is fundamental for the creation of a virtuous cycle in which the community as a whole, benefits from cooperative members who find a decent job opportunity to consumers who have access to high-quality recycled products.

In this sense, the municipal project has an essential role in acting as a facilitating agent, contributing to the articulation between recycling cooperatives, public and private entities, as well as the general population. Thus, the management of the municipal project becomes a fundamental pillar for the sustainable development not only of Apucarana, but of the entire region, enabling a more prosperous, inclusive and environmentally responsible future.

CONCLUSION

This study aimed to investigate the role of a municipal recycling project in supporting cooperatives and fostering sustainability in Apucarana-PR. In conclusion, the partnership established between the Municipality of Apucarana and COCAP proved to be extremely beneficial, promoting remarkable results for the proper management and handling of solid waste in the municipality. However, project associated with these aims must obtain continuous investments in training and infrastructure in order to promote even more expressive and effective advances in relation to this important task.

In addition, it is recommended that strategically designed public policies be implemented, aiming to encourage both the reduction of excessive consumption and the adoption of sustainable recycling practices. These measures aim not only to meet global environmental goals, but also to ensure long-term sustainability, ensuring a more balanced and promising future for future generations.

It is essential to emphasize that through the synergy between the government, civil society and the private sector, it will be possible to consolidate effective changes in solid waste management. In this way, it will be possible to achieve even more expressive results in relation to the preservation of the environment and the improvement of the quality of life of the citizens of Apucarana. Based in these ideas, a joint commitment is necessary among all those involved, ensuring the active engagement and participation of the local community. It is essential to promote educational campaigns, specialized consultancy and incentive programs that encourage sustainable practices in the daily lives of citizens.

Therefore, awareness and behavior change are essential to achieve a greater environmental balance, and the construction of a more resilient society committed to the future of the next generations, since the cooperative members have no dimension of the importance of the service provided to the local community and in a way about the impact caused positively.

Additionally, it would be interesting to have municipal social programs aimed at this class of people, so that there would be an awareness of the preciousness of the good provided to the local society. In view of this factor, the low level of education of the cooperative stands out, and it is interesting and necessary to have literacy support for the cooperative members, which could be implemented by the city hall and also by the universities and local colleges. In this partner predisposition, the extension practice would be of great value, so that the academic community would have access to the reality experienced by this sector that is so essential for the environment and society.

It is relevant to emphasize that the development of adequate infrastructure for the final disposal of waste, such as the construction of modern and efficient landfills, as well as the implementation of comprehensive and effective selective collection programs, and essential measures to promote

sustainable solid waste management. Thus, the integration of advanced and innovative technologies, combined with the adoption of international best practices, will contribute to optimizing processes and maximizing efficiency in the reduction, recycling and reuse of waste, in favor of a cleaner, healthier and more sustainable Apucarana. Through the awareness, engagement and joint work of all those involved, it will be possible to ensure an even more significant impact on the preservation of the environment and the improvement of the quality of life of the citizens of Apucarana, contributing to a more sustainable and promising future.

REFERENCES

- Batista, C. K. L. Souza, & Araújo, D. A. C. (2015). Comprometimento organizacional e gestão de bens materiais e patrimoniais em um empreendimento econômico solidário: um estudo em uma cooperativa de reciclagem. *Rev. Adm. Mackenzie*, 16 (4).
<https://doi.org/10.1590/1678-69712015/administracao.v16n4p15-42>
- Bazanini, C. K. L., Barroso, J. A. R., et al (2021). Empreendedorismo social e desenvolvimento sustentável: Construção de alternativas educacionais junto às cooperativas de reciclagem de resíduos sólidos. *Cadernos de Gestão e Empreendedorismo*, 9(2), 1-13.
<https://doi.org/10.32888/cge.v9i2.51415>
- Bolson, C. (2023). A organização territorial da cadeia de valor dos resíduos plásticos: uma avaliação dos processos socioeconômicos de produção das cooperativas e associações de Curitiba. Instituto Venturi. <https://www.institutoventuri.org/ojs/index.php/FIRS>
- Carvalho, J. M. A. (2023). A reciclagem de resíduos da construção civil e a geração de créditos de carbono: revisão teórica, atualidades e perspectivas. *Repositório Institucional UFRN*, 1-39. <https://repositorio.ufrn.br/handle/123456789/56184>
- Cempre. (2023). Resumo executivo. Ciclossoft. <https://ciclossoft.cempre.org.br/resumo-executivo>
- Crovador, C. C. (2022). Análise de planos municipais de gestão integrada de resíduos sólidos urbanos em municípios de pequeno e médio porte do Paraná. Programa de Pós-Graduação em Engenharia Sanitária e Ambiental.
<https://tede.unicentro.br/jspui/handle/jspui/1971>
- Dias, D. S., & Silva, M. F. (2010). Como escrever uma monografia: manual de elaboração com exemplos e exercícios. São Paulo: Atlas.
- Eunomia. (2024). Impact Report 2023-2024. Eunomia, 1-33. <https://eunomia.eco/wp-content/uploads/2024/06/Impact-Report-2023-2024-Final.pdf>
- Gil, A. C. (2011). Métodos e técnicas de pesquisa social. (6 ed.) São Paulo: Atlas.
- Gonçalves-Dias, Sylmara Lopes Francelino et al. (2023). Plástico de uso único no Brasil: contexto e impactos ambientais. Universidade de São Paulo. Escola de Artes, Ciências e Humanidades. DOI: <https://doi.org/10.11606/9786588503461>

- Horizonte Ambiental. (2018). O que são Cooperativas de Reciclagem e a Gestão de Resíduos Sólidos? <https://horizonteambiental.com.br/cooperativas-de-reciclagem-e-a-gestao-de-residuos-solidos/>
- Ibá - Indústria Brasileira de Árvores. (2023). Reciclagem. Ibá. <https://www.iba.org/reciclagem>
- Lechat, N. M. P., & Barcelos, E. S. (2008). Autogestão: desafios políticos e metodológicos na incubação de empreendimentos econômicos solidários. Revista Katalysis, 11(1), 96-104. <https://www.scielo.br/j/rk/a/bkC35nr8pjTjcj4TZ9PMpbn/>
- Lima, I. A. S. (2024). Economia circular: um panorama brasileiro. Repositório Digital da UFPE.
- MC - Ministério das Cidades. (2023). Sistema Nacional de Informações sobre Saneamento (SNIS). Governo do Brasil. <https://www.gov.br/cidades/pt-br/aceso-a-informacao/acoes-e-programas/saneamento/snis>
- Miquelim, L. L. R. & Oliveira, M. A. (2019). Responsabilidade socioambiental: estudo com a cooperativa de catadores de papel de Apucarana–COCAP. Unicentro, 1-13. https://sguweb.unicentro.br/app/webroot/arquivos/atsubmissao/TCC_Tecno_769_logo_Reciclagem_Final_pdf.pdf
- Ribeiro, L. C. S. et al. (2014). Aspectos econômicos e ambientais da reciclagem: um estudo exploratório nas cooperativas de catadores de material reciclável do Estado do Rio de Janeiro. Nova Economia. 24(1), 191-214. <https://doi.org/10.1590/103-6351/1390>
- Sanitary, C. D. E. E. A. E., & Júnior, A. B. D. E. Q. (2024). Proposta de cenários de gerenciamento de resíduos sólidos urbanos na cidade de Ereré-CE. Repositório Ufersa. <https://repositorio.ufersa.edu.br/server/api/core/bitstreams/43d1fd73-903a-446a-a481-43947233bca9/content>
- Saueressig, G. G., Sellitto, M. A., & KADEL, J. (2021). Papel das cooperativas de reciclagem no retorno de Resíduos Sólidos Urbanos à indústria. Revista em Agronegócio e Meio Ambiente, 14(2), 355-366. <https://doi.org/10.17765/2176-9168.2021v14n2e6537>
- Sema – Secretaria de Meio Ambiente (2024). Prefeitura Municipal de Apucarana. <https://www.apucarana.pr.gov.br/site/orgaos-da-administracao/meio-ambiente/>
- Senger, C. M., Cassandre, M. P., De Souza Venter, S. A., Bossato, M. E. F., Fenato, R., Camargo, C., & De Mello, T. F. (2010). Conscientização empresarial quanto a correta destinação de resíduos sólidos da confecção de bonés na cidade de Apucarana. ETIC - Encontro de Iniciação Científica ISSN 21-76-8498. <https://dlwqtxts1xzle7.cloudfront.net/86523107/2529-5375-1-PB>
- Silva, L. M. & Mello, M. A. G. (2024). Impactos e importância da coleta seletiva na limpeza urbana e na consciência ambiental da comunidade. Revista Engenharia, Meio Ambiente e

- Inovação, 12(1). https://unignet.com.br/wp-content/uploads/Revista-Engenharia-Meio-Ambiente-e-Inovacao-V_12_Jan_2024.pdf#page=31
- Silva, C. L. da , & Sauka, J. E. (2024). Desenvolvimento local e possibilidades de uma economia circular a partir de uma cooperativa de catadores de materiais recicláveis. *Interações (Campo Grande)*, 25(2), e2524030. <https://doi.org/10.20435/inter.v25i2.4030>
- Souza, M. A. de, Silva, M. M. P. da, & Barbosa, M. de F. N. (2014). Os catadores de materiais recicláveis e sua luta pela inclusão e reconhecimento social no período de 1980 a 2013. *Revista Monografias Ambientais*, 13(5), 3998–4010. <https://doi.org/10.5902/2236130815145>
- Souza, M. T. S., Paula, M. B., & Souza-Pinto (2012). O papel das cooperativas de reciclagem nos canais reversos pós-consumo. *Revista De Administração De Empresas*, 52(2), 246–262. <https://doi.org/10.1590/S0034-75902012000200010>
- Torres, V. P., Cazane, A. L., Deróbio, R. S., & da Cruz, L. A. O. (2024). A proeminência das Cooperativas para o avanço dos objetivos de desenvolvimento sustentável. *Revista Multidisciplinar do Nordeste Mineiro*, 2(1). <https://doi.org/10.61164/rmnm.v2i1.2129>
- Vieira, R. (2024). Contrabando de sucatas de baterias: desafios no combate a este crime transfronteiriço frente as legislações existentes. *Revista (RE)definições das fronteiras*, 2(6), 162–205. <https://doi.org/10.59731/rdf.v2i6.96>
- Yoshiyasse C., Andrade B., Matos E., Franieck E., Hernández F. D. M., Becker R., Bosch T. A. (2017). Estudo da Matriz das práticas de ecodesign e políticas públicas de destinação de resíduos, no caso do impacto da “Economia Compartilhada” na “Economia Circular” diante do cenário de mudanças na base fóssil da mobilidade. *XXV Simpósio Internacional de Engenharia Automotiva, Blucher Engineering Proceedings*, 4, 477-496. <https://dx.doi.org/10.5151/engpro-simea2017-36>