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Analysis of the challenges of a private cardboard recycling company to fulfill its mission in the city of Manaus, Amazonas

Análise dos desafios de uma empresa privada de reciclagem de papelão para cumprir a sua missão na cidade de Manaus, Amazonas

Análisis de los desafíos de una empresa privada de reciclaje de cartón para cumplir su misión en la ciudad de Manaus, Amazonas

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Abstract
The trade in materials of cellulosic origin, such as paper, cardboard and others, has shown significant growth in many countries, mainly because they are used as packaging coatings and other forms of reuse, fundamentals of reverse logistics. In this sense, this work aimed to analyze the challenges that a private cardboard recycling company faces to fulfill its organizational mission in the city of Manaus, capital of the state of Amazonas. For this, it followed the steps foreseen in the scientific-technological method. Data were collected through a script of interviews and an observation protocol, organized and analyzed with the help of semantic analysis techniques, identifying central terms of the responses collected by interviews and compared with the observed data; the results were generated with triangulation techniques of the answers obtained with the two instruments and interpreted in a comparative way with the theoretical framework of reference. The results showed that a) the company contributes to environmental preservation through the correct destination of materials and cleaning of public places, b) these contributions are made through obedience to legal procedures, c) its challenges are to have access to all customers industrial and residential areas and make the population aware of the importance of environmental preservation; d) population and governments are the agents that can help overcome these challenges through e) awareness of the importance of sustainability (population) empowering and making the population put sustainability into practice (government). The conclusion shows that, albeit slowly, there is a tendency to increase this desired awareness.
Keywords: Recycling; Reverse logistic; Cardboard recycling; Environmental sustainability; Environmental management.

Resumo
O comércio de materiais de origem celulósica, como papel, papelão e outros, tem apresentado crescimento significativo em muitos países, principalmente por serem utilizados como revestimentos de embalagens e outras formas de reaproveitamento, fundamentos da logística reversa. Neste sentido, este trabalho teve como objetivo analisar os desafios que uma empresa privada de reciclagem de papelão enfrenta para cumprir a sua missão organizacional na cidade de Manaus, capital do estado do Amazonas. Para isso, seguiu as etapas previstas no método científico-tecnológico. Os dados foram coletados através de um roteiro de entrevistas e um protocolo de observação, organizados e analisados com o auxílio de técnicas de análise semântica, identificando-se termos centrais das respostas coletadas por entrevistas e comparadas com os dados observados; os resultados foram gerados com técnicas de triangulação das respostas obtidas com os dois instrumentos e interpretados de forma comparativa com o quadro teórico de referência. Os resultados mostraram que a) a empresa contribui para com a preservação ambiental através da destinação correta de materiais e limpeza dos locais públicos, b) essas contribuições são feitas através de obediência aos procedimentos legais, c) seus desafios são ter acesso a todos os clientes industriais e residenciais e conscientizar a população sobre a importância da preservação ambiental; d) população e governos são os agentes que podem ajudar a superar esses desafios através de e) conscientização da importância da sustentabilidade (população) capacitar e fazer a população colocar em prática a sustentabilidade (governo). A conclusão mostra que, ainda que lentamente, há tendência de aumento dessa conscientização desejada.
Palavras-chave: Reciclagem; Logística reversa; Reciclagem de papelão; Sustentabilidade ambiental; Gestão ambiental.

Resumen
El comercio de materiales de origen celulósico, como papel, cartón y otros, ha mostrado un importante crecimiento en muchos países, principalmente porque se utilizan como revestimientos de envases y otras formas de reutilización, fundamentos de la logística inversa. En ese sentido, este trabajo tuvo como objetivo analizar los desafíos que enfrenta una empresa privada de reciclaje de cartón para cumplir su misión organizacional en la ciudad de Manaus, capital del estado de Amazonas. Para ello, siguió los pasos previstos en el método científico-tecnológico. Los datos fueron recolectados a través de un guión de entrevistas y un protocolo de observación, organizados y analizados con la ayuda de técnicas de análisis semántico, identificando términos centrales de las respuestas recolectadas por las entrevistas y comparadas con los datos observados; los resultados fueron generados con técnicas de triangulación de las respuestas obtenidas con los dos instrumentos e interpretados de forma comparativa con el marco teórico de referencia. Los resultados mostraron que a) la empresa contribuye a la preservación del medio ambiente a través del destino correcto de los materiales y la limpieza de los lugares públicos, b) estos aportes se realizan a través del cumplimiento de los procedimientos legales, c) sus desafíos son tener acceso a todos los clientes industriales y residenciales áreas y sensibilizar a la población sobre la importancia de la preservación del medio ambiente; d) la población y los gobiernos son los agentes que pueden ayudar a superar estos desafíos a través de e) la conciencia de la importancia de la sostenibilidad (población) empoderando y haciendo que la población ponga en práctica la sostenibilidad (gobierno). La conclusión muestra que, aunque lentamente, hay una tendencia a aumentar esta conciencia deseada.
Palabras clave: Reciclaje; Logística inversa; Reciclaje de cartón; Sostenibilidad del medio ambiente; Gestión ambiental.

1. Introduction

Globalization was a determining factor in changing the life of society as a whole. From the instantaneous transfer of information, companies had to adapt to the new needs and demands of the population, since the economic, social and legal pressures, soon after, the environmental appeal appears, as a way of drawing the attention of the companies for the conscious use of raw materials, the disposal of production residues and as an object of environmental preservation, sustainability. Therefore, the traditional system that for decades was used to extract raw materials from nature, produce and consume products, in addition to improper disposal, is being eliminated, giving way to a system that defends new production cycles, which must adopt a sustainable posture. before, during and after consumption of the product, which, even after the end of its usefulness, will undergo a recycling process, becoming useful again (Leite, 2009).

Reverse logistics plays a fundamental role in the post-consumption period, where it has directly contributed to enable the optimization of companies' resources, whether in terms of costs or even compliance with environmental legislation, as well as favoring the practice of recycling for numerous products. Based on current legislation, the National Solid Waste Policy, established by Law No. 12,305 of August 2, 2010 (Brasil, 2010; Cardoso et al., 2014). In this bias, paper, as an object of study of this production, demands from companies investments in logistics and recycling processes, since the disposal has been carried out in large proportions, directly harming the environment. Paper, or even paper trimmings, can be considered one of the largest volume of production and post-consumption waste, as a factor in this proportion, in 2013 Brazil recycled about 4,481 tons of paper (Bracelpa, 2014; Cardoso et al., al., 2014; Brazil, 2013).

This work is justified by the concern about the sensitization of grievances to the environment that companies exercise in front of their activities. Therefore, it has the general objective of analyzing the challenges that a private cardboard recycling company faces to fulfill its organizational mission in the city of Manaus, capital of the state of Amazonas. For this, it followed the steps foreseen in the scientific-technological method developed by Nascimento-e-Silva (2012; 2020a; 2020b; 2021a; 2021b; 2021c), which consists of formulating a research problem, collecting and organizing empirical data to generating the answer to the research question.

2. Reverse Logistics and Sustainability

Reverse logistics refers to the various processes and components of a supply chain intended to support the removal of products classified as returns, complaints, defects. In a commercial context, Govidan, Khodaverdi and Jafarian (2012) state that reverse logistics typically starts with the end user, with used (returned) products collected by intermediaries and efforts to manage the end-of-life of these products, including recycling (obtaining raw materials and components), remanufacturing and final disposal of parts that are no longer used. According to Leite (2009), the reverse distribution channel is the branch of logistics that deals with the flow of post-consumer and post-sale goods from the point of consumption to the place of origin, in order to return them to the production cycle for a period of time. through reverse processes. In repeated use, each product has a predetermined shelf life after which it will no longer be used (Caixeta Filho, 2011). The opposite of logistics is understood as a very important activity for the development of a country, for the proper reuse of its waste and for the proper disposal of ecologically correct waste.

2.1 Reverse logistics: political and legal aspects

In Brazil, basic sanitation services include urban solid waste management and urban cleaning, in addition to water supply, sewage collection and treatment and urban drainage. These topics are interdisciplinary and require management across sectors as they are closely related to development, education, health, environment, water resources, commodity production and consumption. Table 1 summarizes the three main legislations in Brazil on urban solid waste management rules. These federal laws and their respective regulatory statutes create a convergent relationship and, at the same time, complement each other. Reverse logistics, although regulated by Law 12,305/2010, needs to rely on the other two, especially with regard to the interface of the municipal collection system Selectivity with reverse logistics for packaging in general. Therefore, until 2010, there was no legal instrument at the national level to regulate and regulate the requirements and procedures to be adopted for the management of post-consumer products and packaging. According to the resolution of the National Environment Council, the reverse logistics systems in operation even before n° 12.305/2010 are pesticide packaging (resolution 334/2003), waste tires (Resolution 416/2009), OLUC (Resolution 362/2005), and batteries (Resolutions 401/2008 and 424/2010).

Table 1 - Federal laws governing solid waste management in Brazil.

Law	Decree	Goals
12,305/2010	7,404/2010	Establishes the National Solid Waste Policy and defines specific rules for its management, which, in turn, is linked to the execution of urban cleaning services, under the responsibility of the generator and the government. They bring detailed rules on urban solid waste.
11,445/2007	7,217/2010	It legitimized the integration of water supply and sanitary sewage services with those of rainwater drainage, as well as urban cleaning and urban solid waste management services, providing an intersectoral aspect to basic sanitation planning.
11,107/2005	6,017/2005	Provides for associated management, with an emphasis on public consortia, ensuring legal certainty, with a view to achieving scale gains by reducing costs for the management of its public services, within these possibilities, urban solid waste.

Source: Couto and Lange (2017).

The National Solid Waste Policy also stipulates that reverse logistics must be extended to products sold in plastic, metal or glass packaging, and other products and packaging, prioritizing the extent and magnitude of the impact on health. and the environment of the waste generated (Brasil, 2010a; 2010b). In this sense, the federal government has also made packaging in general and unusable medicines a priority for the implementation of reverse logistics through sectoral agreements. The new concepts contained in the law raise a very important issue: sharing responsibility for the life cycle of products, individualization of each link in the production system, ownership of chains and responsibility towards consumers and the

public authorities. Another aspect that deserves to be highlighted in the urban solid waste policy is the regulatory model of reverse logistics through sectoral agreements, commitment clauses or regulations. The study by Richey et al. (2005) and Autry (2005) show that reverse logistics is highly innovative in creating systems and procedures and in finding solutions for handling returned products and materials. The diversity of products and materials requires a high degree of coordination in management and the involvement of multiple waste treatment and final disposal companies (Sheu, 2007).

The interaction between the different aspects of reverse logistics management, in most cases in Brazil, refers to the implementation of reverse logistics in an associative way to obtain external incentives, according to Law 12.305/2010, to bring the different links together of the production chain. Management follows governance, there is the presence of the commercial sector, gathered around a management entity, and the public sector, actively participating in regulation. Management has shown to be mostly shared by manufacturers and importers, with a relationship with the market that is both monopolistic and competitive. In the flow of relationships between the phases of reverse logistics, the consumer is the first agent, in which he acts as a generator, which isolates and packs the material so that it can be collected later.

2.2 Reverse logistics and competitive advantage

Until recently, logistics was limited to the delivery of products to customers, and manufacturers were not responsible for the after-sales of their products. That way, manufacturers don't have to worry about proper collection after the sale. Currently, logistics is a very important area for companies, as it aims to reduce the time between order, production and demand, allowing customers to receive their goods or services at a certain time, place and price. Think of logistics as the process of controlling materials, services and information from origin to point of consumption. Reverse logistics is the reverse flow from the point of consumption to the place of origin. Reverse processes occur with the aim of capturing value or giving adequate final destinations to them (Ramos, 2005). According to the research data, it was possible to observe that the above statement is true, as reverse logistics in the company in question is used as a way of giving a final and adequate destination to the products. In addition, some economic issues are also part of the scenario in which the company fits, because as it is a company in the industrial hub of Manaus, some tax discounts are applied for compliance with certain legislation that is concerned with the environment.

In many cases, reverse logistics is only relevant for environmental and ecological issues, as recycling is one of the topics addressed. However, reverse logistics is increasingly associated with economic issues, as companies seek competitiveness by adding value to customers, with the aim of making profits or reducing losses. In the case of the company studied, some economic issues are also part of the scenario in which the company fits, because as it is a company in the industrial center of Manaus, some tax discounts are applied for compliance with certain laws that are concerned with the environment. environment. For Stock (2001), from the engineering point of view, reverse logistics is a system model that applies the best engineering and logistics management methods in order to profitably close the supply chain cycle. He added that companies that start the reverse logistics process benefit both in terms of a positive institutional image and a view of corporate responsibility (environmental and social).

Lacerda (2002, p. 8) identified the following key factors that contribute positively to the performance of a reverse logistics system:

> a) Good Control of Inputs: Correctly identify the situation of the returned material so that it can follow the correct reverse flow: resale; remodeling; recycling; or discard. When incorrectly identified, it may be due to a lack of Trust in the reason for the return.

b) Standardization and mapping of processes: Reverse logistics must be dealt with regularly so that its processes are properly mapped and procedures verified for control and improvement.

c) Reduced cycle time: Refers to the time between the determination of the need for recycling, disposal or return of a product and the actual disposal.

d) Information Systems: Refers to access to information systems capable of tracking returns, measuring cycle times and improving performance, and identifying consumer abuse of returns.

e) Planned logistics network: The implementation of reverse logistics relies on an adequate logistics infrastructure, capable of accommodating the input of used materials and the output of processed materials.

f) Partnerships between customers and suppliers: Trust and partnership between retailers and industry is essential for the return of damaged manufactured products so that no one feels harmed.

Reverse logistics deals with operationalizing the flow of materials and information for several reasons. Products that are used with little or no use are called aftermarket items. Leite (2003, p. 18) explains that the strategic objective of this phase is "for reasons such as logistical products returned for commercial reasons, errors in order processing, guarantees provided by the manufacturer, defects or malfunctions, shipping failures, etc.". post-consumer reverse logistics makes the flow of material and information actionable. Post-consumer goods are industrial waste, end-of-life materials or reusable materials. According to Leite (2003), post-consumer reverse logistics adds value to a product constituted for assets that were unavailable or still in use by the previous owner.

Reverse logistics enables companies to provide services that make them more competitive in the market. This makes it possible for customers to perceive this value (Leite, 2009). A company can only become competitive when it differentiates itself in the market through the differentiation of perceived value in the eyes of customers in the face of competition, given the increasing similarity of products, the services of each organization are characteristic of their differences, for example, the correct implementation of business logistics and reverse flow. Goes (2016) mentions that reverse logistics has multiple marketing advantages while positively impacting the environment. Likewise, et al., (2006) argue that product and service differentiation is important to gain competitive advantage, add value and meet customer needs and expectations. For Leite (2017), insightful companies realized the various possibilities of achieving sustainable strategic competitiveness through reverse logistics, understanding customer expectations.

In this context, considering the growing importance of issues related to sustainability and environmental protection, companies can use reverse logistics strategically. This facilitates access to suitable collection locations, allows and provides consumers with a cycle of participation in the chain and, on the other hand, brand recognition. For Leite (2009), the objective of gaining competitiveness and customer loyalty through reverse logistics is to provide conditions for the release of store areas so that the items can be returned for recycling or final destination.

The study of reverse logistics and reverse distribution channels has gradually become more important for companies in different sectors (Leite, 2017). The reason for this is that this activity is closely related to environmental protection and business sustainability. According to Desitério (2015), logistics must be linked to socially and environmentally responsible practices. Reverse logistics is a powerful strategy to strengthen a company's relationship with society and contribute to the recycling of resources and reduce production costs.

For Santos and Melo (2015), when reverse logistics is applied and effective, it must be demonstrated through a marketing strategy in order to add value to the company's brand and make it better known and accepted by society, customers and Providers. Ochôa and Lhamby (2016) point out that due to the change in the global situation, it is becoming increasingly difficult to remain competitive, which Differentiation is necessary to stay ahead of the market, and in this way reverse logistics

has been adding a advantage to an organization, both in terms of economic advantages and in terms of a company's marketing strategy.

2.3 Reverse logistics and sustainability

Scientists in many fields have long emphasized the incompatibility between the intensive use of natural resources and the regenerative capacity of the earth (Meadows et al., 1972). The concept of sustainable development, understood as the path of contemporary people developed without compromising the resources of future generations, has completed 30 years of international dissemination without adequate application. According to Sachs (2012), it takes more than two centuries for societies to perceive and feel the effects of unsustainable development patterns, so the 21st century must be a time of change to ensure human well-being.

Based on recent knowledge in production management, such as industrial ecology (Erkman, 1997) and 'cradle-to-cradle' production systems (Mcdonough & Braungart, 2002), a new paradigm has emerged: the circular economy. According to research carried out by Reike, et al. (2017), the first articles on circular economy date from 2007, however, the concept shares the same philosophy of organizing a system that does not separate the benefits of production from the capacity of the biosphere, that the system can flow to the cyclic metabolism of the whole chain.

The exploration of the "closed cycle of production and marketing" means that the circular economy represents an alternative to the classic linear economic model of "buy, make, use and dispose", which is based on abundant materials and energy sources, which are known to be increasingly scarce in the world (Emf, 2013). The circularity of production and consumption systems (characteristic of a circular economy) aims to recover the value of products, resources and even post-consumer packaging (Jabbour & Jabbour, 2017).

According to Zomer et al. (2017), innovation is an intrinsic factor in the transition to a circular economy, as there is a need to implement constructive business models and adopt innovative business strategies. Even interpreting innovative resources as natural does not mean that their implementation is without challenges. The work by Zomer et al. (2017) listed the possible setbacks associated with the construction of these new Transactions styles, including the company's ability to deal with the disparate knowledge of chain agents, collaboration and leadership within the organization.

Good relationships between partners enable logistics from suppliers to end customers, which contributes to a circular economy, as Zhang, et al., (2012) claim that this economic model takes care of the entire production cycle. During the product planning (design) phase, production and distribution takes place through all necessary intermediaries, selecting suppliers. Not only the direct flow of the channels, but also the collection of products for various purposes, including recycling, remanufacturing, reuse or simply an ecologically correct destination (Zhang et al., 2012). With this structure of reverse distribution channels, an important tool emerged to plan, implement and control the flow of products back to the manufacturer. According to the Supply Council, reverse logistics is the part of logistics that is concerned with the movement and management of products, even after the delivery of resources to the customer (CSCMP, 2013).

Reverse logistics has great dynamics. Its products are divided into after-sales (for products returned to the manufacturer for reasons of failure or warranty) and post-consumer (for products returned to the manufacturer after the sale or that have completed their life cycle). Shibao, et al., (2010) mentioned that it focuses on environmental issues, service differentiation, cost reduction, etc. The same authors emphasize that reverse logistics is simultaneously associated with legal, environmental and economic issues, which makes the topic of fundamental importance in the organizational scenario.

In this way, reverse logistics is understood as a necessary tool to prolong the useful life of materials, precisely through the planning and implementation of logistics cycles for returning products (Guarnieri & Cerqueira-Streit, 2015). Reverse logistics helps to meet the need to reduce the negative environmental impacts that companies receive. Therefore, these studies treat reverse logistics as an alternative for closing the circuit and, thus, it can even be understood as one of the tools of the

circular economy concept (Guarnieri et al., 2018). Finally, it is worth confirming that recent articles link the reverse logistics of the circular economy from achieving the sustainable development goals “Industry, Innovation and Infrastructure” and “Responsible Production and Consumption” (Loizidou & Argyri, 2020). They praise the two themes as possible solutions to the economic and social crisis created by the Covid-19 pandemic (Wuyts et al., 2020).

3. Methodology

This study aimed to analyze the challenges that a private cardboard recycling company faces to fulfill its organizational mission. In this sense, this general objective was transformed into five guiding questions, in accordance with the specific objectives of the investigation: 1) what are the company's contributions to environmental preservation? 2) What strategies are used to fulfill this mission? 3) What are the challenges that the company faces to fulfill its mission? 4) Who are the agents that could collaborate to fulfill this mission? 5) What could these agents do to collaborate with the company? The guiding questions were used to help achieve the study objectives. Based on it, the study design, the choice of the investigation site, the subjects who would provide the data, the instruments and respective strategies for collecting, organizing and analyzing the data, as well as the generation and interpretation of the results, described in this section.

3.1 Study Design

The study was carried out in seven stages, namely: definition of objectives, preparation of the interview questionnaire, scheduling the interview, conducting the interviews, reviewing the literature, analyzing the data and discussing the results. All techniques and procedures used are in accordance with the recommendations of Nascimento-e-Silva (2012; 2020a; 2020b; 2021a; 2021b; 2021c), and Limas, et al., (2020), Silva et al. (2020). The definition of objectives was carried out from the choice of the theme to be addressed in the present work, taking into account the need to raise guidelines like this in the city of Manaus, since little is said about the subject. The elaboration of the questionnaire was based on bibliographic research focusing on the key questions to solve the proposed objective. Soon, with the questionnaire assembled, contact was made with the person in charge of the studied company so that the interview could be carried out and the data collection carried out.

The interview was conducted face-to-face so that questions were asked directly to the company representative. The literature review was based on a search of academic articles indexed on the Google Scholar platform, the articles were found through keywords correlated to the theme, namely, "reverse logistics", "recycling", "reverse logistics implementation" , “reverse logistics assessment” and “cardboard reverse logistics”. Data analysis was performed qualitatively, in order to compare the responses obtained with other similar studies present in the literature. Likewise, the discussion was made comparatively with other studies in the literature.

3.2 Research subjects

The investigation was based on the experience of a Brazilian company, founded in 2010, specialized in collecting and managing, in an environmental way, industrial, commercial and domestic waste and from civil construction, which operates in the city of Manaus, capital of the state of Amazonas. , in the Brazilian Amazon. This company promotes actions and processes for the use of waste and its proper final disposal, in accordance with current legislation. The services provided by the company are: collection and transport, segregation and management of waste, destination and secondary actions. Data and information were obtained from the company's management, which constituted the informants of the study. The data sought to understand the entire cardboard recycling process, from collection to delivery to companies that reuse this material as a new raw material to be reprocessed.

3.3 Data collection instruments

Two data collection instruments were used. The first was a semi-structured interview script. This script presented only the questions, without the researchers having any idea what answers would be given to them for each one of them. To guide the proper application of this instrument, the researchers developed a data collection protocol, with instructions on who should answer the questions, what response standards should be followed for each question, and the most appropriate ways of recording the data and information collected.

The second instrument was a script of observations. These observations were agreed by the company's management, since the script was previously presented and approved. Its content contained exactly the same questions prepared for the interview. The reason for this unification was that the answers obtained with both instruments could be compared so that they were consistent and valid for each research question. The following key questions were defined to organize the data collection instruments: 1) What are the two contributions of the company's work to environmental preservation? 2) How are these contributions made? 3) What are the two challenges the company faces in making these contributions? 4) Name two institutions or people that could help alleviate these challenges? 5) What could these people and organizations do to help overcome these challenges? The choice of the company was made through indication. On the scheduled day and time, data collection was performed.

3.4 Data collection strategy

Data collection was carried out in two ways, in line with the instruments developed for this purpose. The first, through interviews with the company's directors; the second, through visits to the company. Data collection through the interview was done using the question-answer strategy, in which the interviewer asks the question and the respondent presents the answer. If the answer presented is well understood by the interviewer, the respondent is asked to present at least two examples of the application of the content of the answer, so that the interviewer has the guarantee that the answer was properly understood. If the first answer presented any doubt, a new question is formulated, now about the doubt, so that the answer and its context can be understood. This procedure was adopted for all key research questions, which led to the creation of several dozen questions and their answers. Questions were asked during the time scheduled for the interview and also during the visits to the company's units.

Data collection through observation took into account specific aspects of each physical space visited and its relationship with the company's challenge to contribute to environmental preservation through recycling activities. In each unit visited, we sought to understand their role in relation to the company's mission, what the unit worked with, with whom it related and its internal challenges. In practice, what was being done in each unit was observed, then the company representative was questioned about the procedures and their purposes, and then notes were taken. This was done throughout the internal journey in the organization.

3.5 Data organization and analysis techniques

After being collected, there were two groups of responses, one for each data collection instrument. Responses were organized separately. The organization was carried out as follows: first, each question and its respective answer were typed into an electronic word processor. Then these questions and answers were grouped around each guiding question of the research, so that five blocks of answers were built: 1) contributions to environmental preservation, 2) how this contribution happens, 3) challenges for making the contributions, 4) agents who could accomplish to overcome the challenges and 5) what these agents could do in this regard.

Data analysis was performed with the intention of identifying the exact answer sought. This analysis was carried out based, first of all, on the structure of the responses. For example, for the question that sought to know what are the two major challenges that the company faces to fulfill its mission, we sought to identify throughout the speech the core of the challenge, that is, which problematic issue was the center of concern of management. This procedure was performed for both groups of responses obtained with each data collection instrument.

Content analysis was used to identify the cores of each response obtained. For example, for the question about the two contributions to environmental preservation, what was intended to identify was exactly the intentional focus of the action. If someone answered "leave a better world to my children", the focus would be "better world", identified by what that means. Similarly, when we sought to know "which two institutions could help alleviate" the challenges of making the world a better place, content analysis was again used. At the end of this procedure, synthesizing tables were made with the answers sought, on which the results generation stage was carried out.

3.6 Techniques for generating and interpreting results

The stage of generating the results had the purpose of elaborating the answers sought for each question formulated. In this sense, generate answers and answer questions in accordance with the empirical data collected. This means that, in practice, the generation of the answer is to portray the empirical reality researched, still disconnected from any theoretical arrangement. The generation of responses was done by comparing the responses obtained with the interviews in relation to the responses obtained with the observation. As the interview and observation scripts had the same content applied in different ways, precise and contextualized answers were obtained for each question. For example, answers were obtained about who are the agents that could collaborate with the company in overcoming its challenges and also at what point in the recycling process they could help. This procedure allowed the responses to complement each other, deepening and giving meaning to the isolated responses.

Interpreting results, in science, means making sense of the answers obtained empirically through and from a theory or theoretical field. The strategy used in this stage was the consequence of what was being predicted in the theoretical arrangement formulated. This means that the empirically obtained answer was theoretically contextualized. In practice, this was done by showing that what was seen in reality is or is not in line with what the theoretical framework of reference predicts. The procedure used was to say a) what was happening, b) how it happens and c) why it happens in the realm of reality and from the perspective of science simultaneously. That is why, in the results section, the empirical findings are first shown and simultaneously or immediately afterwards, the due theoretical explanation.

3.7 Study limitations

This research has some limitations, but they do not invalidate its findings. Two were the main ones. The first is the fact that it focuses on the description of the reality of a single recycling company. The ideal would be to study all the recycling companies on the planet. On the other hand, a global survey would not allow the visualization of so many details and logical schemes that the in-depth study of a single reality allows. The second limitation is of a methodological nature. Data were collected through interviews and observations. But not all the company's employees were interviewed and it was not even possible to observe all the procedures that the organization carries out to fulfill its mission. This would take a very large amount of time. For this reason, one cannot make inferences for other organizations and other realities.

4. Results and Discussion

The organization where the study was carried out is a Brazilian company, founded in 2010, specialized in collecting and managing industrial, commercial, domestic and civil construction waste in an environmentally friendly manner. It thus

promotes actions and processes so that waste has an adequate final disposal, in accordance with current legislation. The services provided by the company are collection and transport, segregation and management of waste, destination and secondary actions.

The reverse logistics process practiced begins with the collections within the partner companies, where the partially separated material is found. The collection is made only of the cardboard, which is then transported to the company. Once there, another sorting is done so that the cardboard is separated from any other material. After sorting, the sorted material is taken to the press, so that bales are made. The bales are transported to customers who use pressed cardboard as raw material. These customers, upon receiving the material, clean it again so that it can return to the flow, reinserting it into new production cycles.

4.1 Contributions to environmental preservation

The company makes two major contributions to environmental preservation, shown in Table 2. The first was the fact that it disposes of the material correctly. This procedure allows the maximum use of the material as a result of a rational process of selection of the stages through which the residue is transformed into new raw material. The second contribution is social. The company considers that the activities carried out by its company make public places cleaner, which can also be translated into a sustainable contribution.

Table 2 - Contributions to environmental preservation.

Contributions	Content
Correct destination	Material in the right place, correct disposal process.
Leave public places clean	Social contribution, by making public places cleaner and sustainable contribution.

Fonte: Dados coletados pelos autores.

According to Scheffer et al. (2013), for several years now, the retail chain has been demonstrating environmental awareness and showing interest in how much it can contribute to the environment, while making employees aware of the importance of recycling and reusing materials that are no longer useful, or that is, this will no longer be true company. These materials are no longer discarded in any way, but are stored on shelves in containers located in branches awaiting shipment, so that they can be taken to their correct destination. During the interview, laws and guidelines were mentioned to which the company is in compliance. The following is two excerpts from the interview:

> "We are a company that works intensively in the area of transport and waste collection. The collection is carried out in loco at the companies that are our customers and partners".
>
> "In companies it is well advanced, because before we collected everything mixed, today not so much. Today we collect everything separately, due to the 2010 law".

The law that the respondents refer to is the National Solid Waste Policy Law, number 12,365, of 08/02/2010. It is worth mentioning, however, that Law 12,605 was enacted on August 2, 2010 and that it is an important instrument that brings many benefits, especially for companies. This legal dimension is very clear in the mentality of the company's directors, as can be seen in the following fragments.

> "The National Solid Waste Policy is a law that establishes instruments and guidelines for public sectors and companies to deal with the waste generated".

"Everything is a process of awareness. The company feels fulfilled by working and helping the environment. The company's objective is sustainable, has documentation and works with standards. And there are collection points in supermarkets and companies in other segments like Queiroz, for example, but we need more disclosure."

4.2 How the contribution happens

The exemplified two great practices of contributions to environmental preservation, shown in Table 3. They are correct destination and the preservation of clean public places. The practice takes place in order to always guarantee the correct destination of its waste, in order to prevent public places from being contaminated with waste or even part of its products.

Table 3 - Contributions to environmental preservation.

Contribuitions	How they happen
Correct destination	Meets legal requests and makes the entire process of collection, transport, separation, preparation of bales to be forwarded to the proper locations
Leave public places clean	Reduce environmental impact with processes

Source: Data collected by the authors.

Establishing a clear and unambiguous environmental policy through a set of rules can help companies to express their environmental and formal commitment to society. This is important to clarify your intentions and principles related to environmental performance (Amaral et al., 2011; Miroshnychenko et al., 2022; Romano et al., 2022; Kerdlap et al., 2022). According to what was answered in the interview, it can be said that the company in question is concerned with environmental issues by saying that its way of contributing to environmental preservation is to comply with legal requests, especially regarding the of the ISO-14001 standard, which provides for the Environmental Management System. During the interview, methods that the company follows to carry out its conscious actions were mentioned, as can be seen in these excerpts.

"The company has been in the market for over 15 years. We have a certificate authorizing the removal of waste from the industrial, commercial and residential sectors. During the month of June, month of the environment, we carry out several actions raising awareness of the process of removal, transport and correct disposal of waste for our customers. We also offer in-house training for employees. So, we arrive, we remove the material that must be separated or not and we carry out the orientation process, as the waste must not be mixed and we send it for collection".

"We have a plant that still receives mixed waste. After being collected, we sort it, sort it and then dispose of it correctly. The cardboard has its specific compartment and goes through another sorting, in case it comes mixed with plastic or other waste. This separation process is to ensure that we only have the cardboard to press. As soon as it is pressed, it leaves in bales directly for companies, such as PCE, which use this material as raw material. And there they clean the material for the return process".

"All the material is recycled and reused correctly, that's why we have large, medium and small transport to meet, according to demand. The bales weigh around 250 kg to 300 kg of cardboard. Per week, we calculate on average the distribution of 6,000 kg per company. And it's a demand that has grown."

"We are a certified company, that's why we work with licensed companies, with the concern of where the material will be allocated. They must be authorized and certified as well. Everything is an investment, because our cost is high in terms of machinery".

"The city administration controls the municipal landfill, which no longer receives waste from companies, such as cardboard. They only receive residential disposal. We are working with several condominiums and we do the entire collection removal process".

"We should create a habit of separation and collection in homes. There will come a time when each residence will have to separate and the garbage collector will only collect organic waste. There is a percentage of the receipt in the municipal landfill, but its useful life is theoretically over."

4.3 Challenges for making contributions

Table 4 lists the three main challenges on which the company develops its contributions to environmental preservation. The three challenges can be considered broad and beyond the scope of the company as a private entity. Thus, it is necessary to seek partnerships with other companies and public institutions so that together they can form a kind of network. This network would have as its main purpose the environmental preservation in a collaborative way. Thus, the three aforementioned challenges would be solved or reduced with greater ease or less difficulty.

Table 4 - Challenges to make contributions to environmental preservation.

Challenges	Content
Challenge 1	As it is a private company, it serves industrial and residential customers, but does not have access to all
Challenge 2	Population awareness
Challenge 3	Access to more collection points

Source: Data collected by the authors.

The issue has become a 'dissatisfaction' in everyday dynamics due to pressures to comply with environmental regulations and try to face the challenges of environmental risks, such as through greater awareness and wiser social groups in terms of consumption. Behind the so-called consensual reasoning around politically correct consumption are interests, power struggles and different projects of social organization (Schmitt, et al., 2022). This is all reflected in the ways in which contemporary social dynamics interact with the environment (Costa & Teodósio, 2011).

From the point of view of companies, many see this situation as an opportunity because, instead of changing their patterns of production and consumption, they are simply "greening" the goods that will be consumed. In this way, green consumption will only face part of the problem, technology. It is the technology that leads to the creation of green products for part of society and allows that part of society to bear the costs of the "added value" of the products. Another part of society, the poor, can only buy inferior products, at a level of consumption lower than what is really needed. People who are aware of their personal behavior, well-informed and concerned about the environment tend to be the new strategy to address issues related to consumption and make the transition to a sustainable society (Costa & Teodósio, 2011; Horwitz, et al., 2022; Fernandes & Saraiva, 2022; Li, 2022).

Discussions on sustainable consumption have been characterized by important conceptual debates and the enormous difficulty in implementing initiatives aimed at promoting a politically correct development model. The proliferation of terms such as green, responsible, ethical, solidary and conscious consumption, which originally referred to the same meaning, can be considered expressions of debates, challenges and dilemmas established in the field, marked by ambiguity.

4.4 Agents that could help overcome the challenges

The increasing environmental degradation and the decline in the quality of life, the increase in air pollution rates, especially in large urban centers, represent a threat to the quality of life of the organisms existing there, as suggested by the

studies of Omri et al. (2022), Anwar, et al., (2022) and Fareed et al. (2022). Therefore, there is an urgent need to revisit the patterns of development, patterns of consumption, unequal distribution of wealth and technological patterns that exist in the world today. Thus, it is evident that there is a need for a set of efforts from different niches so that changes are carried out when it comes to environmental preservation. According to Table 5, the government and the population are the main agents that can alleviate this situation. The government should act to increase awareness and bring information and knowledge to the population about environmental issues and the population should act to put into practice what they are taught in terms of sustainability.

Table 5 - Who could alleviate these challenges.

Agents	How agents could help
Population	Seeking to raise awareness
Government	Intensifying the dissemination of knowledge

Source: Data collected by the authors.

4.5 What agents could do

During the interview, the cultural posture of the Manauara people was mentioned, as presented in this excerpt from the interview:

> "The open dumps in Manaus have already been extinguished. So, today, the environmental concern is greater. Companies want their items reused, thus practicing Reverse Logistics. Many of them already separate the waste and send it to the correct place. The local culture is not yet fully aware, but it has come a long way. And it has advanced institutionally, which is the business part."

In view of this excerpt from the interview and the content of Table 6, it is worth noting that the public power can alleviate the problem by encouraging awareness. This help can be done in schools and even through television. The objective to be achieved is to educate about the importance of environmental preservation.

Table 6 - What agents could do to alleviate the challenges.

Agentes	Descrição
População	Conscientizar a população
Governo	Treinar, qualificar, capacitar em qualidade, meio ambiente e segurança do trabalho. Atuar em unidade de tratamento dos resíduos

Source: Data collected by the authors.

The growing awareness of environmental issues is forcing more and more companies to structure themselves for reverse logistics policies (Abdissa et al., 2022; Koshta, et al., 2022; . The overall objective is to reduce naturally discarded waste. There is enormous value for organizations to add value to these reusable products, bringing more opportunities to new markets and adding social, environmental and economic value to the products that will be discarded (Farias & Santos, 2020). In this context, one of the proposed solutions is to transform consumption patterns, allowing citizens to make the right decisions in their consumption behavior. This would probably lead them to understand that the collective, environmental and social impacts of their individual consumption choices can be translated into improved quality of life and local development. These benefits can be earned now and maintained for future generations.

5. Conclusion

This study analyzed the challenges that a private company that recycles cardboard in the city of Manaus faces to fulfill its organizational mission. The results show that there is a tendency to raise awareness about the relationship between people and the environment, driving actions to protect the natural environment. As a result, actions are being taken to protect, preserve and enhance environmental factors. This has generated the expectation that those responsible for the companies leave aside exclusive visions of short-term financial returns and to adopt strategies that take into account the ecological variables of business success.

Both the theoretical body used and the leaders surveyed agree that good management of reverse logistics can save companies a lot of money. One of the biggest problems is the lack of computerized systems that allow the integration of reverse logistics in the normal distribution process. Therefore, companies create their own systems or outsource the process to specialized companies. The growth of the position of reverse logistics in companies is recent. The implementation of this system has given the company a competitive advantage in terms of cost reduction and improved customer service. Supply chain integration is also required. In logistical coordination between companies, the reverse flow of products must be considered.

The deepening and expansion of studies on reverse logistics in the Amazon region must continue. For this, we recommend the following studies, which aim to: a) create a scheduling technology for the collection of solid household waste, b) reorganize the urban space of the city following the number of inhabitants x number of service stations selective collection, c) train citizens in undertakings whose purpose is the transformation of solid and liquid waste into raw materials and d) develop public awareness campaigns about the importance of practicing selective waste collection.

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