

Case for Teaching

# Bioeconomy in Amazonia: Tensions and Synergies of Corporate Sustainability

## Bioeconomia na Amazônia: Tensões e Sinergias da Sustentabilidade Corporativa



**Discipline:** Operations, Entrepreneurship and Sustainability Management  
**Subject:** Bioeconomy; Supply Chains, Sustainability Tensions and Synergies; Socio-biodiversity  
**Industry:** Food Industry; Bioeconomy; Logistic  
**Geography:** Amazonia, Brazil

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### INTRODUCTION

The Manioca company was established to share the richness of the Amazonian culture, knowledge, and biodiversity with the world. Founded by —Joanna Martins and her partner, Paulo Reis, this food company produces granola, sweets, and sauces from native ingredients, including seeds, grains, and fruits from Northern Brazil. Located in Belém (capital of the state of Pará — PA), Manioca faces the everyday challenges of new ventures and the logistical hurdles of transporting its products to major consumer markets across the country.

With increasing interest in Amazonian flavors, Joanna received an investment proposal from the ABF Fund, managed by Impact Earth, aimed at expanding Manioca. However, she understood that this expansion would require significant effort and dedication to develop and maintain

various production chains. In this new phase, Joanna and Paulo faced a dilemma: Should they invest in developing new suppliers or opt for intermediaries to ensure a steady supply of raw materials? Meeting investor expectations was essential for securing financial support and unlocking new growth opportunities.

In late March 2024, Joanna visited producers and collectors in Oriximiná, Western Pará. Over a week, she immersed herself in the reality of her suppliers and intermediaries, experiencing the daily lives of Amazonian residents. During her boat trip back to Belém along the Amazon River, Joanna reflected on her dilemma. Upon her return to work, she would need to address this issue with the board of directors and begin planning the necessary changes, with a response to the investor due in early May, right after the rainy season.

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## APPRECIATION OF TRADITIONAL CULTURE AND GASTRONOMY

For those from Amazonia who leave the North to live in other parts of the country, finding the flavors of their homeland can be challenging. This was true for Joanna Martins. When she moved from Pará to study in São Paulo in 1998, she struggled to find the familiar products from her region, which intensified her homesickness.

Joanna paraphrased a fellow countryman when she remarked, “The Styrofoam is the territorial extension of the people of Pará.” On her rare visits home, covering nearly 3,000 kilometers, she returned to São Paulo with a Styrofoam cooler filled with Amazonian culinary products, delighting in introducing these typical dishes to her friends, who were often surprised by the experience.

As the granddaughter of a restaurant owner and daughter of renowned Chef Paulo Martins, Joanna was immersed in local cuisine from a young age. She reflected on her father, “His inventiveness and constant desire to teach the world to do better inspire me every day.” The ingredients’ origins and preparation adhered to her family traditions and Amazonian customs. What was commonplace in her childhood became exotic in São Paulo, representing the value of regional culture.

As a decade passed, Joanna returned to Pará in 2008. Along with friends who had also lived outside Belém, she reminisced about her college days and the struggle to find her favorite traditional foods. Amidst local abundance, a curious discomfort arose: “How is it that such good food is so unknown?”

## FIRST ENTREPRENEURIAL ATTEMPT

Joanna launched the online store *Amazônia Empório* in 2009, motivated to bridge the Amazon with the broader world. This venture, co-founded with a friend, emerged from their shared frustration at the lack of regional products in major cities. At the time, challenges abounded: few online stores existed, and e-commerce was in its infancy, with little understanding of online market dynamics. Additionally, logistics from Belém to the Southeast, where most customers resided, were hampered by a shortage of specialized transport companies; the national postal service faced frequent service interruptions and delivery delays.

Joanna encountered numerous other issues: some products lacked added value, exhibited inconsistent quality, or had unsuitable packaging for transport. Higher quality items were scarce or seasonal, complicating consistent supply. Producers often demanded cash or advance payments to guarantee delivery, further complicating operations. There were significant difficulties in understanding and meeting

market demands, whether due to delays in receiving products from suppliers or issues with shipping to other parts of the country. These difficulties ultimately rendered the business unviable, and it closed in 2011.

In 2012, after her initial entrepreneurial attempt, Joanna took over her father’s restaurant, a family business with a rich history and extensive connections in the culinary world. The restaurant supplied regional products nationwide, and Joanna’s father’s friends, renowned chefs, were curious about Amazonian ingredients. This rekindled Joanna’s old dream of building a business centered on local products. A childhood friend often remarked, “Joanna doesn’t give up; she’s creative in finding the best paths for her ideas. There are no barriers to her willpower.”

## THE SEED OF SOCIO-BIODIVERSITY IN A NEW BUSINESS

Excited about the prospect of resuming her dream of integrating Amazonia into the country and the world, Joanna launched, in 2014, a new venture focusing on gastronomy. Together with Paulo Reis, who worked with riverside producers near Belém, she transitioned from e-commerce to a food development and manufacturing enterprise called *Manioca*. The goal was to make Amazonian products accessible elsewhere, develop markets, and incorporate new flavors into mainstream recipes.

Joanna recognized the cultural and ecological richness of the Amazon Forest and aimed to introduce it to the country alongside the concept of socio-biodiversity products. “When local peoples create products or services using the forest’s richness and their traditional knowledge, they embody socio-biodiversity,” she explained. The Amazon Rainforest spans 40% of Latin America, housing an immense variety of species: there are more species of ants in a single Amazonian tree than in the entire United Kingdom<sup>1</sup>. Paulo noted, “There is immense ignorance about what exists in the forest. Estimates suggest there are between 15,000 and 55,000 plant species, yet only 10,000 are currently known.” Joanna agreed, stating, “There is so much more to discover about our socio-biodiversity.”

Among the species from the Amazon Forest that are part of people’s daily lives, a health-promoting product that has gained popularity across Brazil and beyond is *açaí*. However, many other flavors and nutritional properties remain unfamiliar to Brazilians and foreigners. Examples include wild cassava (*Manihot utilissima* Pohl), cumaru (*Dipteryx odorata*), and puxuri (*Licaria puchury*-major [Mart.] *Kosterm*), among others. The list grows when one considers the social aspect of socio-biodiversity and the ways products are traditionally processed and consumed. One example is cassava flour, which is common throughout Brazil

but undergoes different processing methods in Amazonia. As a result, different types of cassava flour can be found on the market, such as *d'água*, *ovinha*, *amarela*, and *filé*, which vary in flavor, texture, and shape. This increases the knowledge that can still be learned about the region.

## MARKET GROWTH AND EXPANSION

Manioca found its niche on what Joanna called the 'Gastronomy Runaway,' where people find the famous nation's culinary talents. By establishing relationships with renowned chefs like Alex Atala, Claude Troisgros, and Helena Rizzo, Amazonian products garnered interest in the specialty market. Initial sales, fulfilling small orders from gourmet markets, paved the way for broader distribution in Brazil's state capitals by 2017, showcasing the products and attracting new potential customers.

Despite the growing market, the products needed adaptation. Locally, the consumption pattern involved minimal processing of the ingredients. However, when transporting these ingredients to other states and regions, it was necessary to ensure a longer shelf life. To reach other markets, the company would need to industrialize the foods. This entry into new markets, especially in the Southeast Region, required a research and development strategy for new products.

Some adaptations to the original recipes were made to keep the ingredients close to their natural state while extending their shelf life and ensuring they were in an easy-to-consume format. For example, *tucupi* is a sauce used as a delicious seasoning in various Amazonian dishes. It is a traditional product with indigenous ancestry, and its production involves the fermentation of wild cassava, which has a short shelf life and requires refrigeration. Therefore, Manioca conducted research to increase the product's shelf life without adding preservatives, and *tucupi* became the company's flagship product. In addition to *tucupi*, the company offers other products in its portfolio resulting from efforts in technology and innovation, such as tapioca granola and snacks made with ingredients from the forest.

Thanks to its research and development initiatives in the food industry, Manioca was recognized as a successful foodtech. In the post-pandemic period, after sales resumed, Manioca's annual revenue grew by between 25% and 40%. In 2024, the company expects to double its sales and take advantage of the growth prospects arising from COP30 in 2025<sup>2</sup> in Belém.

In addition to technology, the company's principles for manufacturing its products included working with ingredients from the Amazon rainforest and building relationships with suppliers and their communities based on fair and responsible trade. These principles attracted several organizations that

support entrepreneurship, sustainability, and Amazon causes. Thus, with a portfolio of healthy, regionally typical, and sustainable products, Manioca began to access national retail markets and the kitchens of the Brazilian population.

## THE CHALLENGES OF SCALING THE FOOD INDUSTRY

The path to scaling a business rooted in regional culture brought numerous supply chain challenges. Expanding sales required navigating the complexities of the modern food industry while maintaining sustainability. However, finding consistent quality and quantity of products from the same supplier was a problem.

In her public speeches, Joanna emphasized the diversity among Amazonian suppliers. Similarly, when speaking about his experiences with communities, Paulo used to say that "the mix of native Indigenous peoples, *quilombolas*, Afro-descendants, and migrants from various parts of Brazil and neighboring countries results in a variety of products, based on different forms of production." This resulted in a productive culture that was also very diverse.

The Amazon Rainforest is home to diverse ecosystems in each location, and many ingredients were sourced from remote areas. Suppliers had difficulty accessing logistics and communication infrastructures, as well as essential services such as electricity, sanitation, health, and education. To ensure a consistent supply chain, it was necessary to consider the logistical challenges and the longer time and cost of transporting goods by river. Some products travel for days to reach the factory, subjected to the tropical heat and humidity that negatively impact the quality of the raw materials. Additionally, in some areas, there was difficulty in accessing means of communication for commercial negotiations. Cultural differences also raised deeper issues, such as the real needs of suppliers. They often did not aspire to produce more to sell and accumulate capital. Joanna asked herself, "And which culture is the right one?"

Paulo constantly reinforced the need to respect the traditions and practices of the communities to ensure fair trade: "It is vital to avoid overexploitation of the ecosystem and maintain the balance of the forest." Thus, the natural limitations of production and regeneration of the forest represented a restriction on the quantity of product supplied. There was instability in the supply of raw materials, which prevented the establishment of commercial relations and supply contracts.

Manioca had already been in business for seven years, and the industry's concerns about the local community had been recognized. Paulo said, "in addition to providing income and stimulating production for these families, Manioca also focuses on innovation, adding value to Amazonia, preserving

the forest, and, above all, supporting the people in the region.” The industry received several awards, such as the Good Business for the Climate Awards offered by Climate Ventures and the CNI/Sebrae National Innovation Award, both in 2019, and the Sirha Innovation Awards received in Lyon in 2021, besides several product design awards. As a company that works with products from standing forests and respects local communities, it attracted the attention of impact investors such as Mirova, an international investment fund focused on sustainable companies that, in 2021, provided capital to the company. In 2022, the company obtained B Corp certification. Manioca valued its history and the entire path it had taken. Figure 1 illustrates the timeline of Joanna’s trajectory.

## SUPPLY OF RAW MATERIALS IN THE AMAZON

Manioca was committed to sustainable sourcing and implemented strict environmental policies. The biggest challenge, however, was meeting larger markets’ demands while respecting Amazonia’s delicate ecological balance. They knew that increasing production could lead to the growth of monocultures to the detriment of local biodiversity. There was also the issue of deforestation to expand production and environmental degradation.

Demand was increasing, and following the growth trend of recent years, expectations for 2024 exceeded 30%. Since the post-pandemic period, Manioca began to require more inputs. Therefore, Joanna needed to decide how to obtain an adequate supply of products since the company could either develop local suppliers or outsource this through intermediaries.

The first option had great potential for positive local impact, supporting income generation for collectors, small producers, and local communities. “It would be great to partner with riverside communities, to grow and learn together,” thought Joanna. Furthermore, the social benefits would align with Manioca, a social enterprise recognized by investors.

Joanna could not do it alone. She and her partner, Paulo Reis, had been discussing what they needed to do for a month and analyzing the many difficulties. Manioca, at the time, had only 15 employees. The first step would be to hire a person responsible for purchasing with knowledge of the productive dynamics of the forest. Supporting the development of suppliers involved, among other actions, training, and financing for tools and infrastructure. Regarding this, Paulo considered: “Here in the Amazon, the lack of legalization of the land of our potential suppliers represents a risk that worries investors, so we would have to support the community in land issues as well.”

There were many financial factors to be considered. Joanna asked: “Paulo, have you thought about how much time and resources we will need to plan and operationalize the supplier development actions? What will the final cost of the products be?” For investors, some of these initiatives were outside the company’s strategic objective, burdening the budget. At the same time, Joanna’s responsibility to ensure the legality of its suppliers would follow its ethical values, reduce reputational risks, and attract the interest of investors concerned with sustainability.

Some problematic questions loomed over them: “How can we ensure that communities and suppliers deliver products in the way the company needs?” “Where and how can we find suppliers spread out in the middle of the immense forest?” In Amazonia, it is difficult to communicate with some producing communities due to limited access to telephone and internet infrastructure. “What could and should Manioca do about this?”

The second option, using the extensive network of intermediaries in Amazonia, also had several advantages and disadvantages. Negotiating with people who buy and sell products is a common practice and a necessity in the region. Many routes along the rivers take hours, and even days, of travel to cover short distances. Producers and collectors, especially the most isolated ones, have historically needed the help of intermediaries. Traders go to the communities, making selling products much more convenient for producers, as some even accept exchanges for primary inputs such as sugar, rice, and flour. Due to the lack of access to transportation and limited commercial experience, suppliers are unable to assume the costs and logistical risks to local markets and consequently have little bargaining power to negotiate better prices.

In some cases, intermediaries come from the communities themselves. When organized, one person becomes responsible for transportation and marketing in the villages. This way, there is a better distribution of profits from sales between producers and collectors. However, the diversity of products is smaller because communities work only with what nature offers in each location.

For the company, negotiating with intermediaries would require less effort and resources, reduce costs, and bring greater outreach among producers, reaching more remote communities and places. Manioca would no longer be concerned with the development of local suppliers, and the intermediary would be responsible for ensuring that orders met the quality and quantity requested by the industry.

The risks, however, potentially clashed with the company’s values. Manioca would be unaware of the working conditions of suppliers. Even without a direct relationship with producers, by purchasing from inappropriate suppliers, there was a risk that the company would indirectly support cases of bad practices and unfair commercial relations.

## SUSTAINABILITY DILEMMA

Upon arriving at the port of Belém on Sunday morning, Joanna was concerned about jeopardizing the values that guide Manioca while also wanting to serve its primary stakeholders. It would be necessary to build trust with the intermediaries and, indirectly, support the producers involved. In conversation with her partner, Joanna reflected out loud, “The community I visited does great work and has several plans to increase production in the future. I believe they are

a great example of a sustainable supplier.” Paulo replied, “But will that be enough to meet the growth in our production? Maybe we need to negotiate with the intermediaries to have a guarantee.”

The next day, Monday, Joanna was called to a meeting with Manioca’s Executive Board. At the end of this meeting, Manioca would have to disclose its final decision to investors. Together with the Board, Joanna would have to analyze the pros and cons of the options: (1) developing suppliers or (2) buying from intermediaries.

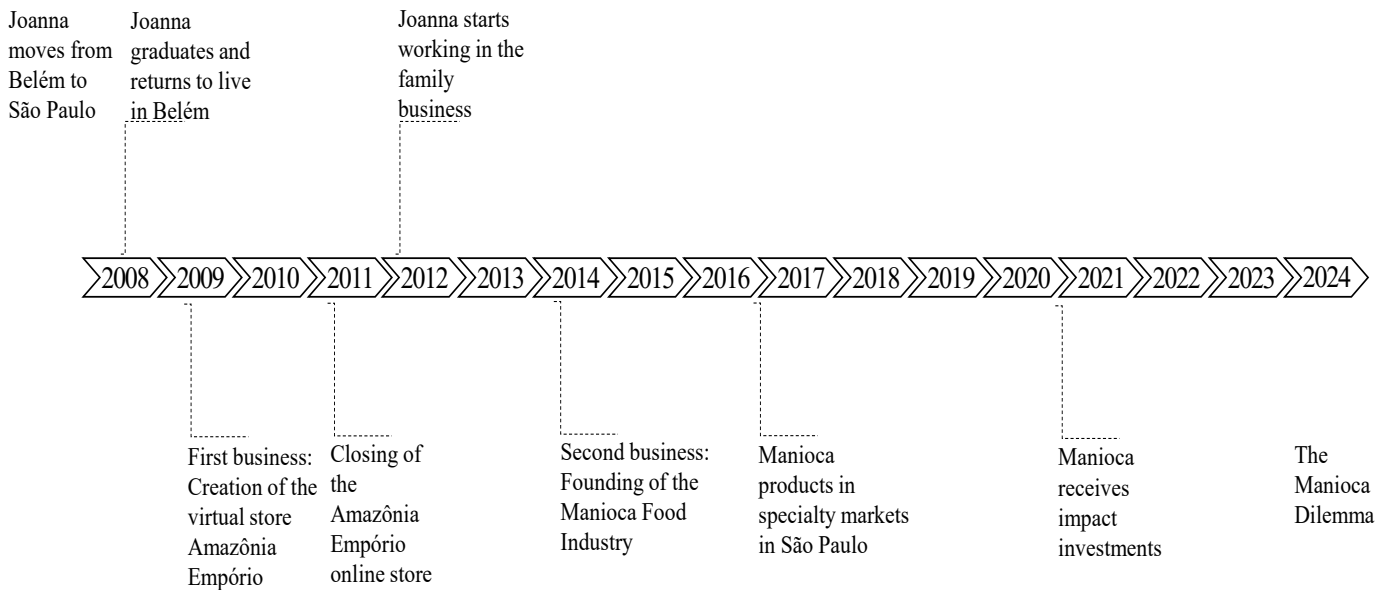


Figure 1. Timeline of Joanna’s trajectory and her ventures

## NOTES

1. Nobre, C., Encalada, A., Anderson, E., Roca Alcazar, F. H., Bustamante, M., Mena, C., Peña-Claros, M., Poveda, G., Rodriguez, J. P., Saleska, S., Trumbore, S., Val, A. L., Villa Nova, L., Abramovay, R., Alencar, A., Alzza, A. C. R., Armenteras,

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2. Values published on the Boas Notícias website. <https://boanoticiabrasil.com.br/2024/04/16/manioca-pretende-levar-ao-mundo-ingredientes-da-amazonia/>



## Teaching Notes

### ■ ABSTRACT

Manioca is a successful food-tech company, an entrepreneurial initiative emerging from a desire to share the flavours of the Amazonia globally. The scarcity of typical Amazonian products in the Southeast region of Brazil, coupled with a general interest in Northern cuisine, led Joanna Martins to pursue her vision of commercializing Amazonian products. After an unsuccessful venture, her experience paved the way for success in her second business: the Manioca, a food industry based on local raw materials. The industry prioritizes sustainable sourcing and fair stakeholder relationships. Joanna and her co-founder, Paulo Reis, navigated numerous challenges but now face difficulties securing additional supply for the industry due to Amazonia's limitations. She confronts the decision to either develop suppliers directly or outsource through intermediaries, each impacting the industry's economic, social, and environmental dimensions differently. This case focuses on the concepts of triple bottom line and sustainability tensions and invites students to consider the factors influencing Joanna's decision. This analysis is relevant to management, sustainability, operations, entrepreneurship, and agribusiness disciplines. It underscores the complexity of corporate sustainability, advocating for a systemic perspective beyond financial metrics and reevaluating current sustainability frameworks.

**Keywords:** bioeconomy; triple bottom line; sustainability tensions; supply chain; Amazonia.

### ■ DATA SOURCE

The case study aims to develop an understanding of the interdependence, tensions, and synergies between the dimensions of the triple bottom line in order to promote systemic thinking in problem-solving through inductive learning.

Related theory and concepts: Triple bottom line (Elkington, 1998, 2018); sustainability tensions (Carmine & De Marchi, 2023; Hahn et al., 2010, 2015).

The following contributions are expected:

**Knowledge:** Learning about the interdependence between the triple bottom line dimensions and decision-making conflicts.

**Skills:** Developing the capacity to analyze and identify potential tensions and sustainability synergies.

### ■ RESUMO

A Manioca representa uma premiada *foodtech*, resultado de uma iniciativa empreendedora motivada a compartilhar os sabores da Amazônia globalmente. A indisponibilidade de produtos típicos da Amazônia na região Sudeste e o interesse crescente pela culinária do Norte, fez com que Joanna Martins seguisse a sua visão de comercializar os produtos de sua terra. Depois de um empreendimento que não alcançou o êxito previsto, Joanna usou esse aprendizado para impulsionar o sucesso em seu segundo negócio: uma indústria alimentícia baseada em matérias-primas locais chamada Manioca. A indústria prioriza o fornecimento sustentável e relacionamentos justos com as partes interessadas e, devido às limitações da Amazônia, a empresa enfrenta dificuldades em garantir o fornecimento à indústria. Joanna juntamente com seu sócio Paulo Reis precisam decidir se a empresa desenvolverá diretamente os fornecedores ou terceirizará o seu abastecimento por meio de intermediários. Cada escolha tem diferentes impactos nas dimensões econômicas, sociais e ambientais da indústria. O objetivo deste caso é aumentar a compreensão sobre a interdependência, tensões e sinergias entre as dimensões do tripé da sustentabilidade a fim de promover o pensamento sistêmico na resolução de problemas. O caso convida a analisar os conceitos do tripé da sustentabilidade e das tensões da sustentabilidade. Essas análises são relevantes para disciplinas como gestão, sustentabilidade, operações, empreendedorismo e agronegócio. Ele também destaca a complexidade da sustentabilidade empresarial, defendendo uma perspectiva sistêmica para além das métricas financeiras, e reavaliando os atuais padrões de sustentabilidade.

**Palavras-chave:** bioeconomia; tripé da sustentabilidade; tensões de sustentabilidade; cadeia de fornecimento; Amazônia.

Atitudes: Promoting systemic thinking for problem-solving.

### ■ CASE APPLICATION

Topics studied: Triple bottom line, sustainability tensions and synergies, supply chain, Amazonia context.

Disciplines: Sustainability Management, Operations, Entrepreneurship.

Audience: Undergraduate and graduate students (stricto and lato sensu, including executive training).

The presentation of the case and the triple bottom line aims to build a concrete idea so that students can understand sustainability tensions, a more abstract concept, following the logic of inductive teaching (Assis et al., 2013). Activity A is a warm-up and introduces students to the case. Activity B contributes to understanding the triple bottom

line, the central concept to be discussed. The discussion of Activity C will lead students to inductively understand how tensions occur since they will have difficulty classifying the benefits, whether social, environmental, or economic, and they will question whether one choice automatically leads to the exclusion of another. One example is supplier training, which generates a high cost for the company and has a smaller geographical scope, reducing potential social benefits.

## DATA SOURCE

The research was conducted through a case study based on a real company, Manioca Comércio de Alimentos da Amazônia Ltda, from Belém, State of Pará. The case was developed using primary and secondary data. Primary data were obtained through semi-structured interviews with the protagonist and a company advisor. Secondary data were collected from partner organizations' reports, social networks, and the official website <https://maniocabrasil.com.br/>.

## PREPARATION FOR CASE DISCUSSION

Students should pre-read the case to identify key issues, stakeholders, and possible solutions related to supply chain stability and sustainability.

## TEACHING PLAN

The suggested teaching plan aims to achieve the didactic objectives in two hours. Activities A, B, C, and D indicate the step-by-step process to be followed by teachers, with the respective time for each one. This activity sequence helps practically apply the concepts of the triple bottom line and sustainability tensions.

Activity A: Warm-up: Tables A.1 and A.2 (15')

Activity B: Elaboration of the triple bottom line: Tables B.1 and B.2 (40')

Activity C: Discussion on sustainability tensions: Table C.1 (40')

Activity D: Conclusions: Table D.1 (25')

Each activity has guiding questions for teachers to apply to students. Sequentially, each question has a table with the possible answers that can emerge from the classroom discussions to assist teachers. The tables are organized into topics that structure the content and can be reproduced if the teacher considers it appropriate. Students do not need to describe all the items on the board, but they do need to know the main points. Teachers can write down students' answers following the format presented on the boards in order to facilitate a general understanding of the case.

## ANALYSIS OF THE CASE IN THE CLASSROOM

### Activity A: Warm-up

This activity is an open discussion about the case with the participation of the students. It aims to start the conversation dynamic and promote interaction..

#### A.1: Who is Joanna? What is Manioca?

Table A.1 presents the possible answers for this first warm-up activity, organized into topics. The students talk about the information about the protagonist and Manioca, its products, and the industrial sector.

**Table A1.** Answers to the questions: Who is Joanna and What is Manioca?.

Who is Joanna	What is Manioca
Entrepreneurial woman.	Food industry located in the North of Brazil.
Born and raised in the Northern Region of Brazil.	Processing of ready-to-eat products from raw materials.
Daughter of chefs.	Trade in products from Amazonia.
Studied in São Paulo.	B Corp.
Motivated by local culture.	Impact company focused on fair and responsible trade.
Local cuisine lover.	Foodtech for innovation and product development.

## A.2: What are Manioca's strategies? What are Manioca's challenges?

Table A.2 presents some suggested answers to this activity. This

discussion brings the context of Manioca and reinforces the understanding of the dilemma and tensions of sustainability.

**Table A2.** Answers to the questions: What are Manioca's strategies? What are Manioca's challenges?

Strategies	Challenges
Market expansion through visibility of the culture and eating habits of the Northern Region, especially Pará.	Obtaining raw materials for the industry despite their seasonality.
Entry into niche markets for special food products (healthy, natural, innovative, and ethical).	Demand for responsible relationships and supplier development.
Development of new products through research and innovation.	Instability in the quantity and quality of supply.
Implementation of sustainability, social responsibility, business ethics, fair and responsible trade initiatives.	Difficulty in implementing sustainability practices in the supply chain.
Positioning as an impact company and certified B Corp.	Demand for innovation to increase durability and maintain the original characteristics of products.
Attraction of impact investors.	Complex operation due to the branching of suppliers and the Amazonian context.
Relationship with suppliers and local communities.	Need for market development in other regions and countries.

## Activity B: Developing the triple bottom line

This activity discusses the triple bottom line (TBL) concept framework. The discussion of the TBL is based on the central dilemma faced by Joanna regarding market expansion:

Option 1: Develop suppliers

Option 2: Buy from intermediaries

Students should discuss the relevant benefits for the company, separating the three bottom line axes into option 1 (question B.1) and option 2 (question B.2). Each question then covers the social, economic, and environmental axes. They are followed by an 'Explanation' section that discusses the framework and clarifies how potential doubts are part of the activity flow because they indicate the first tensions of sustainability. Ultimately, the 'Theoretical-conceptual foundation' item presents the triple bottom line concept, supported by seminal academic studies. The section also

addresses other definitions involving the application of the TBL, such as trade-offs and win-win relationships.

The discussion can be done in just one group or, if the class has more than 15 students, the teacher can follow the restrictive inductive method (Assis et al., 2013). This method divides the class into smaller groups to facilitate greater participation, and the main points are presented in plenary.

## B.1: What are the economic, social, and environmental benefits of developing suppliers?

Table B.1 provides possible topics raised in student responses to this question and is for teacher use. The 'Explanation B.1' section then discusses the key points in the table and the general rationale for developing suppliers.



**Table B1.** Answers to the question: "What are the economic, social, and environmental benefits of developing suppliers?"

Economic	Social	Environmental
For Manioca		
Reinforcement of the company's image to promote positive impact and consequently attract investment.	Monitoring and potential improvement in the working conditions of producers and collectors.	Company knowledge of suppliers' environmental practices.
Lower reputational risk.	Potential for co-creation and development of new products based on local knowledge.	
More sales due to consumer engagement with the cause.		
For supplier communities		
Generation of income and creation of employment and income alternatives.	Professionalization of local producers.	Local population as proactive protectors of the forest.
Better commercial conditions.	Close relationship with the community, with long-lasting and stable relationships with suppliers.	
Less commercial and economic dependence in the long term.		
For the government and macroenvironment		
Generation of taxes on product sales.	Strengthening local culture and socio-cultural integration of the region with the rest of the country.	Valuing socio-biodiversity products.
Benefits and economic movement of some communities in the region.	Cultural inclusion (less xenophobia) by exhibiting more regional products.	Maintaining the local ecosystem under socio-environmental standards accepted in the market.

### Explanation B.1 for teachers

The economic benefits of choosing to develop local suppliers mean working directly with the local population, which can bring positive marketing to the company and generate greater consumer engagement, helping to increase sales. In addition, building trust between Joanna and the producers can be positive for her and allow her to have long-lasting and stable relationships with her suppliers. Knowledge of the supply chain also reduces legal and ethical risks, increasing investor interest.

In social terms, the company would help to professionalize local producers, bringing a clear positive impact. At the same time, communities such as forest defenders would be strengthened culturally. Joanna would develop a relationship with the community, contributing to sharing learnings that help the population's financial independence and the development of new products by Manioca. In addition, the proximity of Joanna and other employees to local communities would facilitate understanding of the population's needs and align the company's actions with the reality of the people. Joanna and Manioca would assume a proactive role in monitoring the ethics of the relationship and local development.

Environmental supplier development actions would involve raising awareness among the local population about the direct financial returns of keeping the forest standing and using natural resources responsibly. It has been proven that areas of the forest inhabited by local populations who live off renewable natural resources are less deforested. People would become co-responsible for local biodiversity, and interest in illegal activities

with high environmental impact, such as mining and illegal logging, would decrease.

Separating social, economic, and environmental benefits is not simple and leads to many discussions. Students may wonder where the division between benefits begins and ends since, in practice, they are interconnected. The intersection area of the triple bottom line seems much larger when one tries to analyze the limits of each dimension. The systemic vision, discussed by Elkington and explained at the end of the activity, explains the connections between the social, economic, and environmental elements since they are all open systems.

### B.2: What are the social/economic/environmental benefits of buying from intermediaries?

Table B.2 supports teachers because it presents the possible topics raised in the students' answers to this question. The information for each axis of the TBL is organized between Manioca, supplier communities, and government and macroenvironment to facilitate understanding the different levels involved in sustainability issues. The table is followed by item 'Explanation B.2,' which deals with the general explanation of the table and the application of the activity in the classroom.

**Table B2.** Answers to the question: "What are the social/economic/environmental benefits of buying from intermediaries?"

Economic	Social	Environmental
For Manioca		
Savings and lower costs due to reduced operations due to the transfer of responsibilities, supplier training, and product logistics.	Reduction of employees in purchasing operations and relations with producers.	
Price stability and negotiation due to easier access to raw materials (with variety and quantity).	Social investments directed to other areas of the company.	Reduced environmental demands due to the transfer of responsibility.
The development of intermediaries can generate certifications, standardization, and traceability of the products and services offered.	Use of existing relationship networks. Possibility of differentiating between more or less fair intermediaries — and valuing best practices.	
For supplier communities		
Income generation with convenience in the sales process.	Greater reach and branching out of suppliers and communities, with consequent distribution of benefits.	
Means of survival for stakeholders who perform intermediation, logistics, and marketing of products.	Intermediaries are already related to the communities, know the paths, and understand cultural differences.	Less chance of monoculture development since the products come from several producers and suppliers.
The intermediary may be from the community itself with a lower premium on marketing.	Stability for intermediaries and their suppliers.	
Gains in optimization of storage infrastructure, product refrigeration, and logistics, avoiding bad practices and loss of product quality.	Training to develop intermediaries would help organize the community (in association or cooperative formats) if the intermediary is from the supplier community.	
For the government and macroenvironment		
Generation of service taxes.	Integration of the region's products with the rest of the country.	Optimized river transport by intermediaries, taking advantage of the existing infrastructure, optimizing and improving the service.
Benefits and movement of the economy in several communities in the region.		Less boat traffic on the rivers, reducing pollution and the risk of accidents involving the region's fauna/flora.

### Explanation B.2 for teachers

Negotiating with intermediaries can bring economic benefits to the company, as it would reduce short- and medium-term costs and investments. There would be lower costs and logistical risks for transporting and preserving products, as well as lower costs for communication actions. Investments in the development and maintenance of personnel and structure for training and monitoring suppliers would also be reduced, thus allocating resources to expanding products and markets, which is the current aim for Manioca.

Socially, since intermediaries have greater capillarity and can buy different products from different communities, there would be greater participation of different producers and collectors. This would increase the reach of the supply chain, getting to producers who do not have access to logistics. Some intermediaries work in the barter system, taking basic food products, such as sugar and rice, in exchange for raw materials. Other intermediaries are part of the communities,

which would help ensure a better distribution of benefits among local people and groups.

The environmental benefits of negotiating with intermediaries involve branching out the supply chain, reducing the risk of overexploitation in a single location, and minimizing the risks of developing a monoculture. In negotiating with intermediaries, the development of suppliers and environmental maintenance would depend on Joanna's relationship and trust with the intermediaries.

### Theoretical-conceptual basis of Activity B

In an attempt to facilitate corporate sustainability actions, [Elkington \(1998\)](#) coined the concept of the triple bottom line. This TBL is represented by a three-dimensional social, environmental, and economic structure in which companies must 'support' their performance. The dimensions, also called 3Ps for people, planet, and profit, dictate that companies are responsible for their economic profits and social and environmental impacts.

The TBL structure led companies to seek actions based on a win-win relationship at the intersection of the dimensions for the benefit of all: company, society, and the environment. On the other hand, corporate sustainability trade-off relationships involve situations where it is impossible to achieve social, economic, and environmental objectives simultaneously (Bansal, 2005). Therefore, win-win situations are rare. Van der Byl e Slawinski (2015) discuss the impossibility of win-win relationships and how trade-offs generate tensions in sustainability management. Examples occur when managers practice sustainable actions only when they serve their own interests (Bansal & Song, 2017), or when they avoid dealing with tensions between social, environmental, or economic actions (Van der Byl & Slawinski, 2015).

### Activity C: Discussion on sustainability tensions

This activity presents the interrelations between social, economic, and environmental elements, as well as the points at which there is a need to prioritize one of the triple bottom line dimensions. This prioritization generates

sustainability tensions, which is the concept studied in this activity. Thus, students have difficulty fitting their answers into a single dimension and are faced with choosing which aspect of the TBL is most relevant to the argument.

This activity has only one question for students; therefore, it is only one table with the possible topics addressed by students. The explanation of the activity shows the manifestations of tensions in complex decisions since some characteristics can be identified among students during discussions. This explanation based on academic studies helps the teacher deal with possible conflicts and reinforces the concept of sustainability tensions with students. The following section, ‘Theoretical-conceptual foundation,’ presents other studies of sustainability tensions with more complex examples.

### C.1: Which sustainability tensions are present in each option?

Table C.1 is aimed at teachers and consolidates the main topics that may arise as students respond to the discussion.

**Table C1.** Responses to the question: "Which sustainability tensions are present in each option?"

Developing suppliers	Buying from intermediaries
Supplier service and training bring social and environmental benefits but increase fixed operating costs in non-strategic activities.	Reducing the company’s operating costs by transferring risks and expenses to intermediaries means there is no control over third-party profits, potentially reducing the communities’ margins excessively and exposing them to exploitation.
The various territorial challenges for developing suppliers (e.g., distances to reach them, land legalization of their production areas, isolation, and lack of communication) increase the costs and risks of investments, reducing the number and scope of suppliers benefiting.	The greater scope and reach of suppliers in isolated parts of the forest increases the distribution of benefits to regions that the company does not reach, increases the diversity of raw materials, and stimulates product innovation, but reduces the company’s knowledge about production and increases the risks of using poor production practices, both environmental and labor-related.
The production of some local peoples and traditional communities is part of their culture and religion, so bringing an external understanding of what development is can negatively impact local traditions and interfere with the preservation of cultural roots.	Access to more producers through intermediaries increases the consistency of supply quantity but can also increase the variation in product quality.
Generating income for the community can create economic dependence and, depending on the product, increase monoculture to meet the demand for Manioca.	The local culture is already based on intermediaries, so using the already established system arouses fewer social and environmental changes. There is less potentially negative interference in the livelihoods and culture of local communities.

### Explanation C.1 for teachers

Each choice impacts the dimensions of the triple bottom line differently, as seen in the answers to the previous questions. By focusing on local producers’ development,

Joanna would have a highly positive socio-environmental impact but would also have to face economic consequences in the short term, with an increase in costs. Additional activities for the company are costly, such as paying facilitators and teachers for courses and training, providing

the necessary materials. It would also involve making financial resources available in advance to suppliers who need to invest in their production to meet Manioca's orders. This could impact the company's liquidity, causing it to make cash available to suppliers or even money that could be invested in other internal activities. There could be a return in the long term, but this is uncertain and cannot be guaranteed.

However, a clear positive impact can be expected from this decision in terms of helping local communities develop and achieve financial independence, which is related to the values of Joanna and Manioca. It would also positively impact the environmental dimension since, when the community understands the value and importance of keeping the forest standing, they become defenders of biodiversity, not a threat to it.

Helping local producers develop and become suppliers can make the community dependent on the company. Measures can be taken to prevent this, but if nothing is done about it, a large part of a community's income could depend directly on Manioca since the company would make large purchases, and many producers would have to work only for it to meet demand. This makes it difficult for the community to diversify production and activities.

Buying from intermediaries can increase purchasing costs, considering that they need to charge a fee or increase the price of the products to have their own profit margin. Buying from intermediaries could also have a positive social impact, but only if these intermediaries contributed to the development of local producers. However, buying from intermediaries can be risky, as they may exploit these producers, for example, by charging high fees for selling and transporting products through them. The impact would be negative, as it would create a dependence of local communities on such intermediaries.

The classroom discussions reflect some of the organizations' difficulties in dealing with sustainability tensions. During the discussions, there are potential conflicts between students. When faced with tensions, people and organizations respond in different ways.

(1) **Conflictual defenses:** these are based on contradictory positions and are expressed through repression of tension (or reaction by aligning with one side of a dual tension) or by separating tensions into different spaces or times. These are evasive responses.

(2) **Long-term defenses:** confrontation, acceptance, adjustment, or transcendence. Unlike defensive responses, confrontation acts directly on the management of paradoxical tension. This response involves the search for a solution. The acceptance type of response involves the search for balance. [Poole e Van de Ven \(1989\)](#) propose working positively with paradoxes; thus, acceptance uses them constructively by embracing the opposing elements. Secondly, spatial separation considers the levels of analysis and the clarification of how they interrelate. Another answer addresses temporal separation to understand the influences of time on the change of paradoxes. The fourth alternative is synthesis, which introduces new terms that respond to a paradox.

### Theoretical-conceptual basis of Activity C

When considering sustainability tensions, there are difficult choices and decisions for managers seeking corporate sustainability ([Bansal & DesJardine, 2014](#)). [Hahn et al. \(2015\)](#), state that the main difficulties in adopting sustainable practices are related to decision-making since each choice can have unintended consequences. Thus, each decision that aims to contribute positively to one dimension can negatively impact another. This happens because of the interdependence between the triple bottom line dimensions ([Hahn et al., 2015](#)).

In addition to the TBL, [Hahn et al. \(2015\)](#) highlight other relevant factors for generating sustainability tensions. One example is the tension generated by the influence of the decision-maker's values and purposes on their actions. Thus, managers can make different choices when faced with a decision, even with the same alternatives. However, these choices can generate disagreement between managers at different hierarchical levels regarding the best decision for sustainability, including because some believe it should be a priority while others do not.

Another tension highlighted by the authors is prioritizing short-term and long-term vision. The short-term vision consists of the organization's focus on actions that bring a quick return, that is, profit, since it needs high revenue to cover its costs and remunerate its investors. Only then will it be able to maintain its activities. However, a company that seeks corporate sustainability needs to have a long-term orientation

since it needs to understand the importance of having practices aimed at a positive environmental and social impact, even if the benefits for the organization take time to be perceived (Hahn et al., 2015).

Another difficulty for organizations in managing the tension arises from isomorphism versus the need for change for corporate sustainability. Isomorphism consists of the tendency for organizations to continue to operate the same way, maintaining constancy in their activities. However, relevant changes are often necessary to integrate sustainability into the organization's routine (Hahn et al., 2015).

### Activity D: Conclusions

Activity D aims to summarize the discussions in the case study. The main points (Table D.1) analyzed in each activity demonstrate the sequence required for inductive teaching. Students thus internalize the issues involving the three pillars and tensions of sustainability. At the same time, they understand the challenges faced by purpose-driven entrepreneurs who intend to benefit society but must deal with the traditional business world.

Sustainability issues often do not have a single solution or a correct position. The teacher must reinforce that the company's decision is not a one-off. The case presents a dilemma aligned with what the literature establishes as tensions and synergies of corporate sustainability. The context of this decision involves the objective of a food company to guarantee the supply of raw materials for the expansion of its business. However, many cultural, social, environmental, and ethical issues must be weighed. The academic discussion addresses the tensions of corporate sustainability and analyzes the various possible paths.

Previous studies classify bioeconomies into three distinct categories based on their underlying principles, objectives, and associated risks (Bugge et al., 2019; Holmgren et al., 2020; Vivien et al., 2019). The first category, the biotech bioeconomy, prioritizes economic growth and job creation, often at the expense of sustainability considerations. In contrast, the bioresource bioeconomy focuses on innovating the use of natural materials and improving production practices while managing waste, but this can increase pressure on natural resources and lead to monoculture

in land use. The third category, the bioecological bioeconomy, rooted in ecological economics principles, prioritizes sustainability and biodiversity conservation, albeit on a smaller scale due to scale limitations. Each category impacts biodiversity differently, with the biotechnological and bioresource bioeconomies posing risks to ecosystem integrity and biodiversity, while the bioecological bioeconomy advocates a restorative approach, emphasizing ecosystem conservation and equitable distribution of benefits (Bastos Lima & Palme, 2022; Bugge et al., 2019; Vivien et al., 2019).

In corporate sustainability, it is essential to distinguish between the concept's origin and its implementation in organizations. The definition derives from the concept of sustainable development as "development capable of meeting the needs of the current generation, without compromising the ability of future generations to meet their own needs" (Brundtland et al., 1987, p. 54). Sustainability, therefore, accompanies the idea that there are resource limits that must be respected in order to meet future needs. Despite not having a fully established and accepted concept, several examples of corporate sustainability initiatives exist.

Synergy appears among the initiatives and represents the search for managers who work with sustainability issues. It goes beyond the idea of 'unity is strength' because it is not enough to unite different people and organizations with different capacities and interests. A metaphor that explains synergy is that of a football ball and its sewn pieces, the absence of which causes the ball to cease to exist. Thus, efforts and entities must be analyzed so that capacities are directed to ensure synergy for sustainability.

Elkington proposed a realignment of the concept to draw attention to the problems of using the triple bottom line. Although more and more organizations are concerned with sustainability issues, "our climate, water resources, oceans, forests, soils, and biodiversity are increasingly threatened" (Elkington, 1998, p. 2). Therefore, the concept must be expanded, returning to its origins and looking at sustainability at a systemic level. Table D.1 suggests the activity's main conclusions to support teachers' work in the classroom.



**Table D1.** Main conclusions.

Tensions and synergies in corporate sustainability
<ul style="list-style-type: none"> <li>● Dealing with tensions and seeking synergies is necessary for those who work seriously with sustainability.</li> <li>● The TBL is useful for understanding and ordering the main points of analysis of a sustainability dilemma.</li> <li>● However, it is challenging to fit the discussion into the triple bottom line because the tensions result from the interaction between the social, economic, and environmental dimensions.</li> <li>● The social, environmental, and economic arguments overlap when we answer the questions about the benefits of each dimension and the dilemma's tensions.</li> <li>● This shows that the TBL is integrated because it is interrelated and that it is systemic due to the connections between its elements.</li> <li>● The systemic view is consistent with the first definition of sustainable development and has a broader scope than the TBL view, which focuses more on the business reality.</li> </ul>
In 2018, 25 years after coining the term 'triple bottom line,' Elkington made a call to rethink:
o The importance of considering the interrelations between social, environmental, and economic elements.
o The sustainability decisions that should not be made only considering the financial side.
o The way the sustainability theme has grown, and the importance of systemic changes in thinking about future capitalism.
● Working with sustainability requires people to deal with inherent tensions. There is no single solution or correct position. The most important thing is to develop the capacity for interaction and have a systemic view of the dimensions of the triple bottom line.
● The concept of synergy represents the union of joint efforts in which everyone is needed for a common goal.

## EPILOGUE

The professor concludes the class by presenting Joanna's decision at the end of the discussion. In order to expand her supply chain, Joanna decided to focus on developing suppliers. It was a challenging task. The organization trained an agricultural professional to purchase the supply chain to ensure the best ingredients for her products. This professional mapped out suppliers with the potential and motivation to adapt to market demands. Joanna Martins says: "We selected ingredients with market potential whose suppliers could offer a good product and were willing to work on self-development." The company then could count on commercial partners to supply raw materials from the forest.

The employees had to create various teaching materials, supply standards, and proper production practices. Additionally, a lawyer supported the company in interpreting land laws and marketing family products. The employees felt motivated by the social benefits involving Manioca and better understood the cultural characteristics of the local populations. Furthermore, the direct relationship with suppliers helped the company to adapt product recipes and to have the raw materials needed to create new products.

The work with suppliers caught the attention of impact investment organizations. After receiving an award at the Forum for Impact Investment and Sustainable Business in Amazonia, the company received seed capital from three financing organizations. They also later received an

investment for strategic planning and the implementation of the Advisory Board.

Over time, synergies emerged in new supply alternatives, reinforcing the company's sustainability commitment. Manioca became part of Origens Brasil, a network of producers from indigenous communities and family farmers, companies, and other institutions that assist in the commercial transactions of the native peoples of Amazonia. The network connects companies that want regional products, guaranteeing resources for those who help keep the forest standing. This enabled Manioca to obtain the needed raw materials by coordinating the network's institutions with the producers and ensuring transparency and ethics in commercial relations.

The company is moving toward establishing partnerships with research institutes and jointly producing scientific data on socio-biodiversity products. Establishing partnerships for research and development and adopting an

Advisory Board with upstream and downstream partnerships represent the business ecosystem. The current challenge concerns the market potential of its socio-biodiversity products. Developing new products and discovering market opportunities require research and investments. The goal of reaching exports and international markets requires significant R&D efforts. Although the ingredients have been consumed regionally for a long time, many nutritional characteristics and benefits remain unknown.

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