

CHARACTERIZATION OF THE URBAN SOLID WASTE COLLECTION CHAIN AND REVERSE LOGISTICS IN THE MUNICIPALITY OF BARRETOS- SP

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Abstract: The increase in population and consequent increase in consumption of products has generated a significant increase in problems arising from solid waste. In order to deal with this problem, society has created laws and instruments. The objective of this article is to describe and analyze the current solid waste collection chain in the municipality of Barretos-SP, in order to identify measures to improve the process aimed at the circular economy, thus proposing the project contract. The work is qualitative in nature, by applied purpose, descriptive depth, as the source of documentary and field data, and quasi-experiment design. From a questionnaire and bibliographic research, it was possible to identify that, although there is no regular selective collection, the collection chain is being structured. In view of the facts, the improvement project was prepared as a suggestion to operationalize the process of the selective collection and reverse logistics chain in the city, aiming at the concept of circular economy and population awareness through environmental education.

Keywords: Reverse logistic; Environmental education; Circular Economy; Urban solid waste; DMAIC.

INTRODUCTION

CONTEXTUALIZATION

The industrial revolution can be considered a milestone in Brazilian history, in 2021 alone Brazil's GDP was R\$8.7 trillion, growing by 4.6%, surpassing the losses that occurred in the pandemic (IBGE, 2022). And by 2050, it is estimated that the urban population will increase by 70% (ABREU; MARCHIORI, 2020). The growing demand of cities carries negative impacts on the environment, as spaces that were previously natural, with closed biological cycles, were transformed into urban centers, with an open technical cycle (SILVA; ROMERO, 2013).

Analyzing the biological cycle and the technical cycle, it was possible to perceive that the bottleneck in this system refers to the decomposition system of the generated product, because as the solid waste generated is a material with technological interventions to transform itself into a final product available to the consumer, it doesn't just decompose with fungi and bacteria at the same rate as in the biological cycle. Making technological tools necessary to assist in the decomposition of solid waste generated by open technical cycles.

Therefore, the implementation of integration policies reversing the scenario of energy insufficiency, using reverse logistics, thus acting in the reverse cycle of these solid waste that were generated (CHIROLI, OIKO, SANTOS, 2014). For each diversification of waste, as regulated by law number: 12,305 of August 2, 2010, which establishes the National Policy about Solid Waste, with diversified origin, it is associated with correct handling and management. The article proposes to develop a case study of the current urban solid waste collection chain in the municipality of Barretos-SP, and after analyzing the indicators, propose improvements through a project contract so that the system is optimized, resulting in benefits for the environment.

METHODS

The first stage of the schedule began with a review of the literature and entities responsible for implementing projects related to the themes that make up this article. To complement through the National Solid Waste Policy - PNRS, it was possible to establish a standard to analyze the state and municipal laws elaborated with the objective of complying with what was proposed in the national law. Subsequently, a semi-structured questionnaire was prepared, based on the Contabilizando Resíduos platform developed

by the State Government of Paraná and the Secretary of Sustainable Development and Tourism. The developed project follows the DMAIC (Define, Measure, Analyze, Improve, Control) methodology.

OBTAINED OR EXPECTED RESULTS

According to the data collection, 100% of the collection of the total demand of the rural and urban population is carried out, but data on the per capita accounting related to the collection of waste from the rural population and the urban population were not made available. In urban areas, door-to-door collection is carried out through an outsourced company contracted through a bidding process for collection. Rural collection is carried out at strategic points with buckets, where the residue is deposited by rural residents and then collected by the outsourced company.

The amount of collection per year for urban and rural areas was 65,282 tons in the year 2021, the final destination is in a sanitary landfill. At the moment the municipality does not hold collection for organic products for composting. And selective collection is not carried out either, but it is being tendered for its initiation.

FINAL CONSIDERATIONS

The selective collection chain project with the introduction of reverse logistics. The waste would be disposed of by the rural and urban population selectively, separating recyclable waste, organic waste and non-recyclable waste. Each type of waste would be collected by the agency or even autonomous collectors as long as they are registered to take responsibility and follow up on reverse logistics.

The insertion of recycling bins is also valid, the idea that residents have the option of taking recyclable urban solid waste to the recycling

bins. Organic waste in small amounts can be treated domestically, large amounts of waste can be directed to treatment in rural areas of the municipality instead of industrial plants, thus strengthening the commercialization of the municipality itself.

The recyclable waste is capable of being reintroduced into the production cycle of companies in the municipality, or in another cycle, being able to return to the original state or transform into a new product, when separated and stored correctly. On the other hand, non-recyclable waste can be considered as common waste.

It is important to point out that in order to monitor this process, it is beneficial to count the flattened indicators, to create a database systematizing future improvements and ensuring adequate monitoring of collected waste and those inserted through reverse logistics in the production system.

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