



Benefits of the selective collection in the public company “Companhia Docas do Pará” – CDP, in the Amazon / Brazil

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Companhia Docas do Pará – CDP

- Is a mixed economy (private/public) company;
- Founded in 1967;
- Is responsible for the administration and commercial exploration of port facilities in the state of Pará.





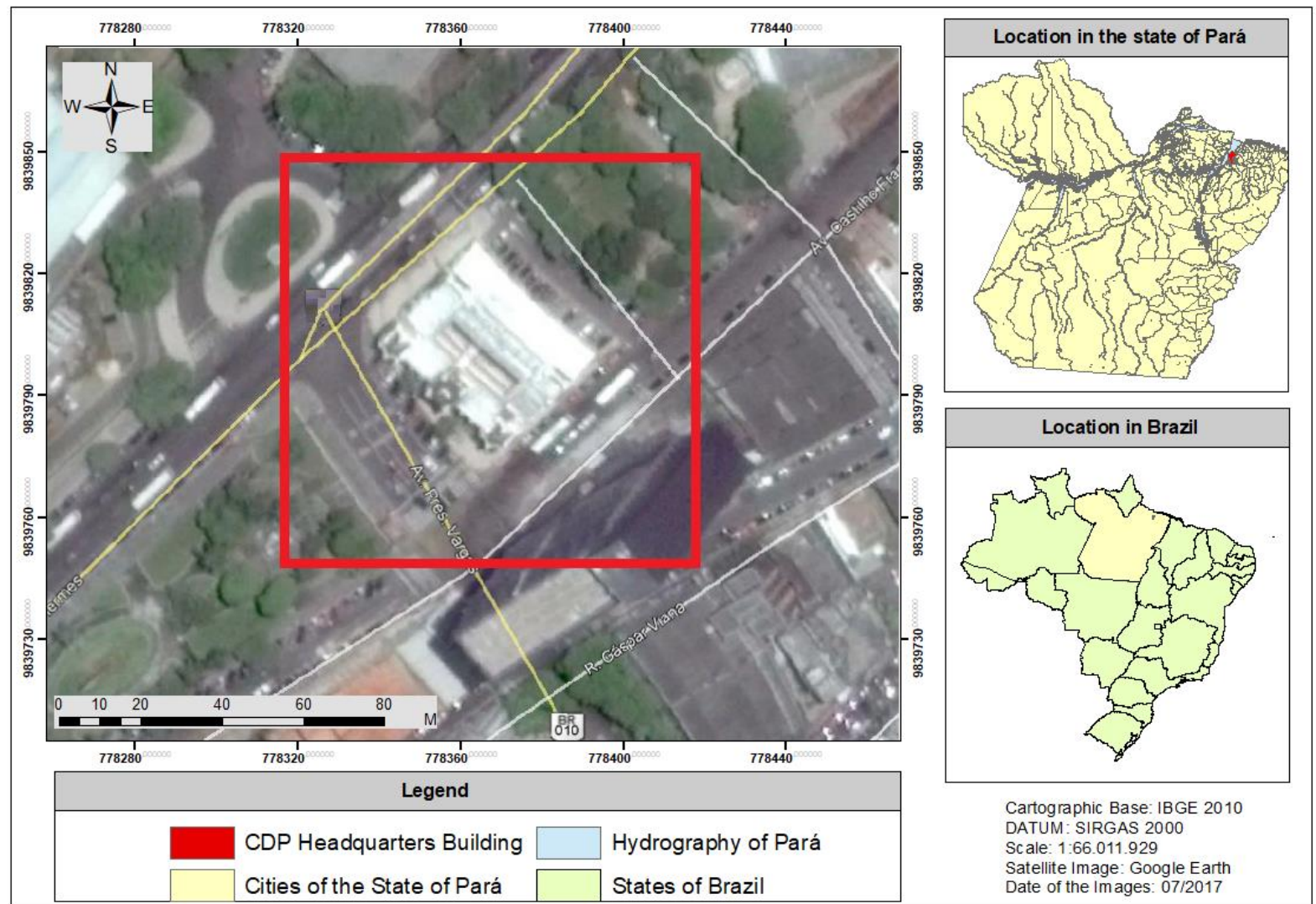
BELÉM – PARÁ – BRAZIL

Pop: 1.450.000 Hab



STUDY AREA

Figure 1 - Area of study adopted in the research.

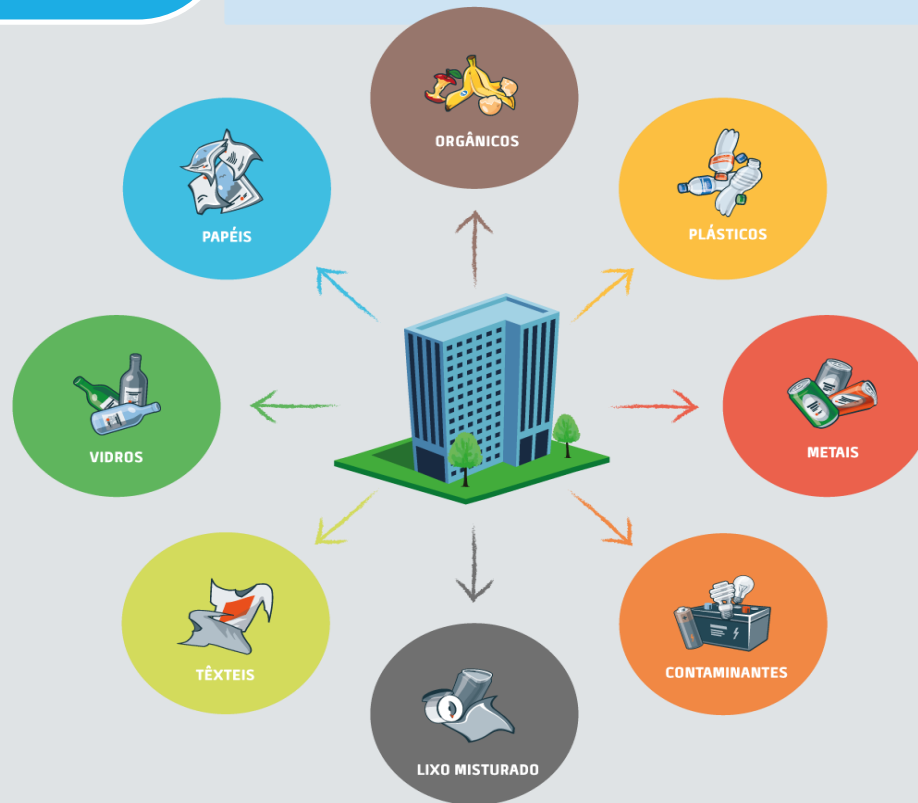




VILA DO CONDE	2018 (t)	CARGO HANDLING IN THE UNITS:
ALUMINA	770.188,00	
BAUXITE	741.844,00	
CAUSTIC SODA	264.454,00	
MANGANESE	175.049,00	
ALUMINUM HYDROXIDE	168.684,00	
MINERAL COAL	156.594,00	
FUEL OIL	148.002,00	
FERTILIZERS	139.069,00	
WOOD	68.417,00	
PETROLEUM COKE	61.891,00	
MIRAMAR	2018 (t)	MIRAMAR PORT
DIESEL OIL	268.642,00	
GASOLINE	150.831,00	
GLP	83.528,00	
ALCOHOL DENATURED	83.150,00	
FUEL OIL	55.537,00	
AVIATION KEROSENE	35.768,00	
DRINKS, ALCOHOLIC LIQUIDS AND VINEGARS	3.102,00	
BELÉM	2018 (t)	BELÉM PORT
WHEAT	23.527,00	
FATS, ANIMAL/VEGETABLE OILS	11.147,00	
FUELS AND MINERAL OILS AND PRODUCTS	917	
FUEL OIL	630	
REACTORS, BOILERS, MACHINES	554	
SUPPORT LOAD	406	
AIRCRAFT, VESSELS AND PARTS	320	
VEGETABLES, PLANTS, ROOTS AND TUBERCULOS	260	
MACHINE, APPARATUS AND ELECTRICAL SUPPLIES	240	
FISH AND CRUSTACEANS, MOLLUSCS AND OTHERS	142	

Federal Resolution nº 5.940/2006

- the entities of the federal public administration should directly and indirectly institute the separation of discarded recyclable waste, still in the generating source, and its destination to associations and cooperatives.



OBJECTIVES



- Identification of the results obtained from the implantation of the collection of waste subject to recycling.
- Evaluation of the economic benefits that the CDP obtained in the period from 2007 to 2017 with the selective collection.

METHODS

- The research was developed in two stages.
- The first stage was divided into two phases.

Stage 1 - Phase 1

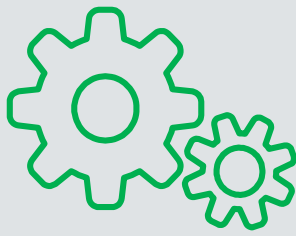
- bibliographic research on articles, theses, dissertations and documents made available by CDP as the contract signed between CDP and outsourced company.

Stage 1 - Phase 2

- Verify the waste inventories of the study area from 2007 to 2017, payment processes including invoices and certificates of final destination and interview with the then managers of the environment sector of CDP.

Stage 2

- Tabulate the data, do the statistical work and formulation of the calculation of the quantitative monthly and annual waste and their respective final destination costs, and comparisons.



RESULTS

- How the process happened?



- Implemented the selective collection in 2008.



Source: <https://blog.useorganico.com.br/coleta-seletiva-de-lixo-e-reciclagem/>

- ○ What changed in the company?
- Selective collectors for paper, plastic and organic waste were available in all rooms of the building, as well as collectors for paper, plastic, metal, non-recyclable, organic, glass and batteries in the areas of circulation.





- Several environmental intervention meetings have been held with the objective of sensitizing federal employees and temporary employees



Federal employees: 122
Temporary contract
employees for cleaning
activities: 19

The recyclable materials are removed daily from the collectors and temporarily stored in 200 liters bags with the coloration varying according to the type of waste, and later delivered to a cooperative in the region, usually once a month.





- Positive results were obtained:
 - Causing a progressive decrease in the number of collections performed weekly by contracted company.

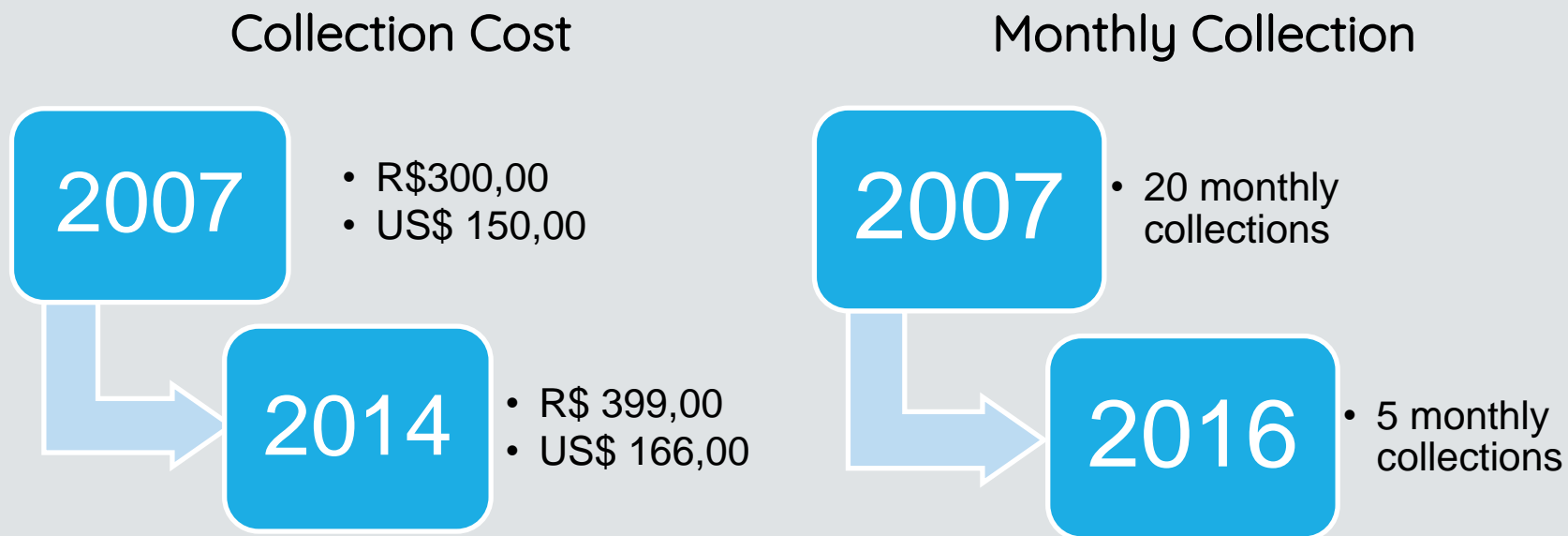
In the period considered in this study, it was evaluated that the employees of the CDP began to collaborate actively in the process, gradually increasing the total of recyclable waste, so the cost savings with the destination of non-recyclable materials.

Table 1 - Inventory of solid waste at CDP.

Year	Annual amount of waste generated (kg)	Monthly average (Kg)	Number of collection / year	Monthly average	Total value of service (R\$/year)	Monthly average (R\$)
2007	10.763,00	896,92	232	19,33	69.600,00	5.800,00
2008	10.435,50	869,63	231	19,25	69.300,00	5.775,00
2009	9.558,00	796,50	222	18,50	66.600,00	5.550,00
2010	8.740,00	728,33	218	18,17	65.400,00	5.450,00
2011	8.105,00	675,42	215	17,92	64.500,00	5.375,00
2012	5.713,00	476,08	167	13,92	50.100,00	4.175,00
2013	4.861,00	405,08	115	9,58	34.500,00	2.875,00
2014	4.879,00	406,58	103	8,58	41.097,00	3.424,75
2015	3.389,00	308,09	90	8,18	39.334,75	3.264,55
2016	4.942,00	411,83	73	6,08	29.127,00	2.427,25
2017	3.286,00	298,73	37	3,36	14.763,00	1.342,09



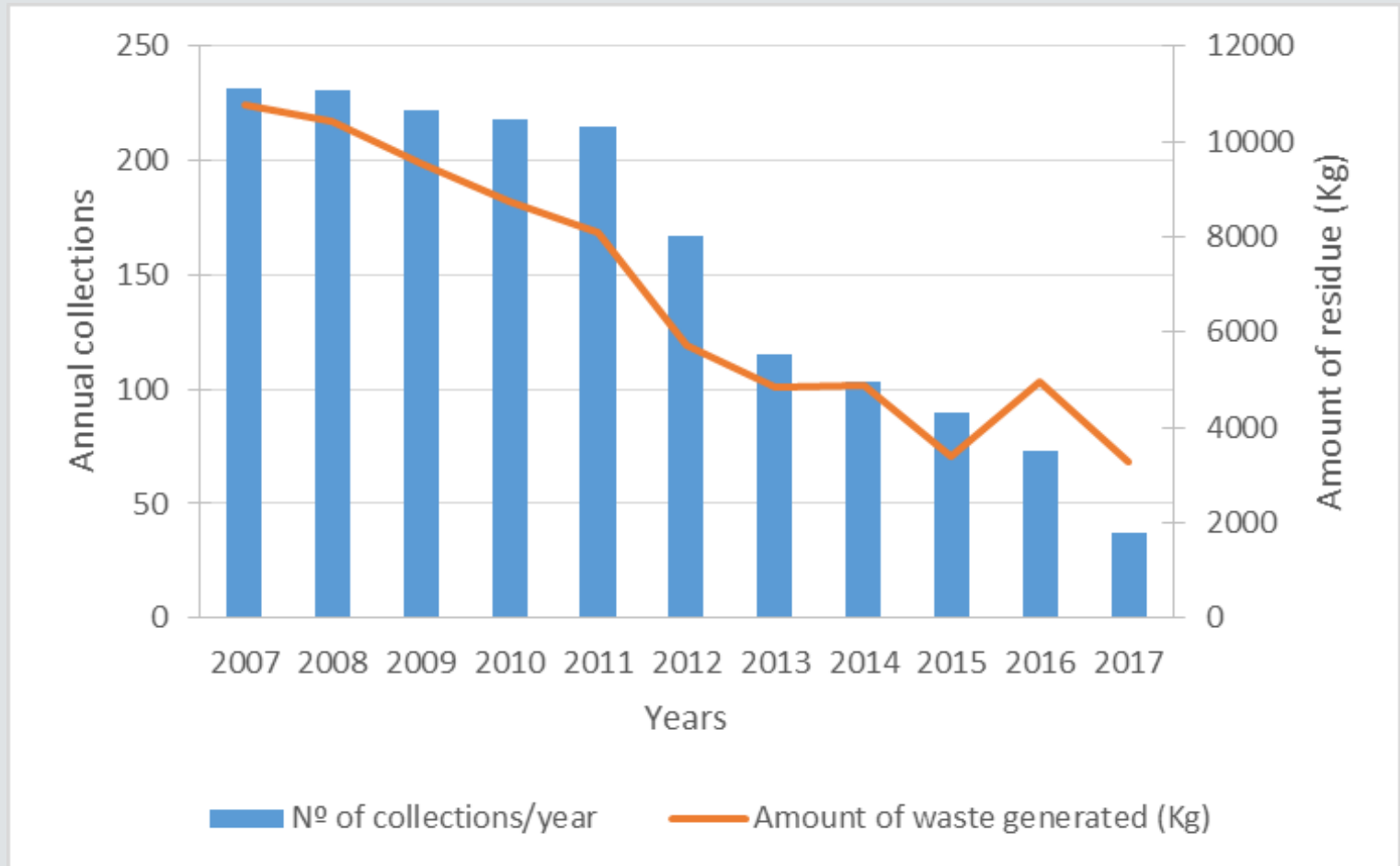
- Quantitative and cost of the collections



Initially, in 2007 an average of five (5) weekly collections of waste per contracted company were carried out, around 20 monthly, while in 2017 the average collection was 1 (one) weekly, around 4 to 5 per month.

The Graphic 1 adequately represents the process of evolution of the selective collection program implemented at Companhia Docas do Pará in 2008.

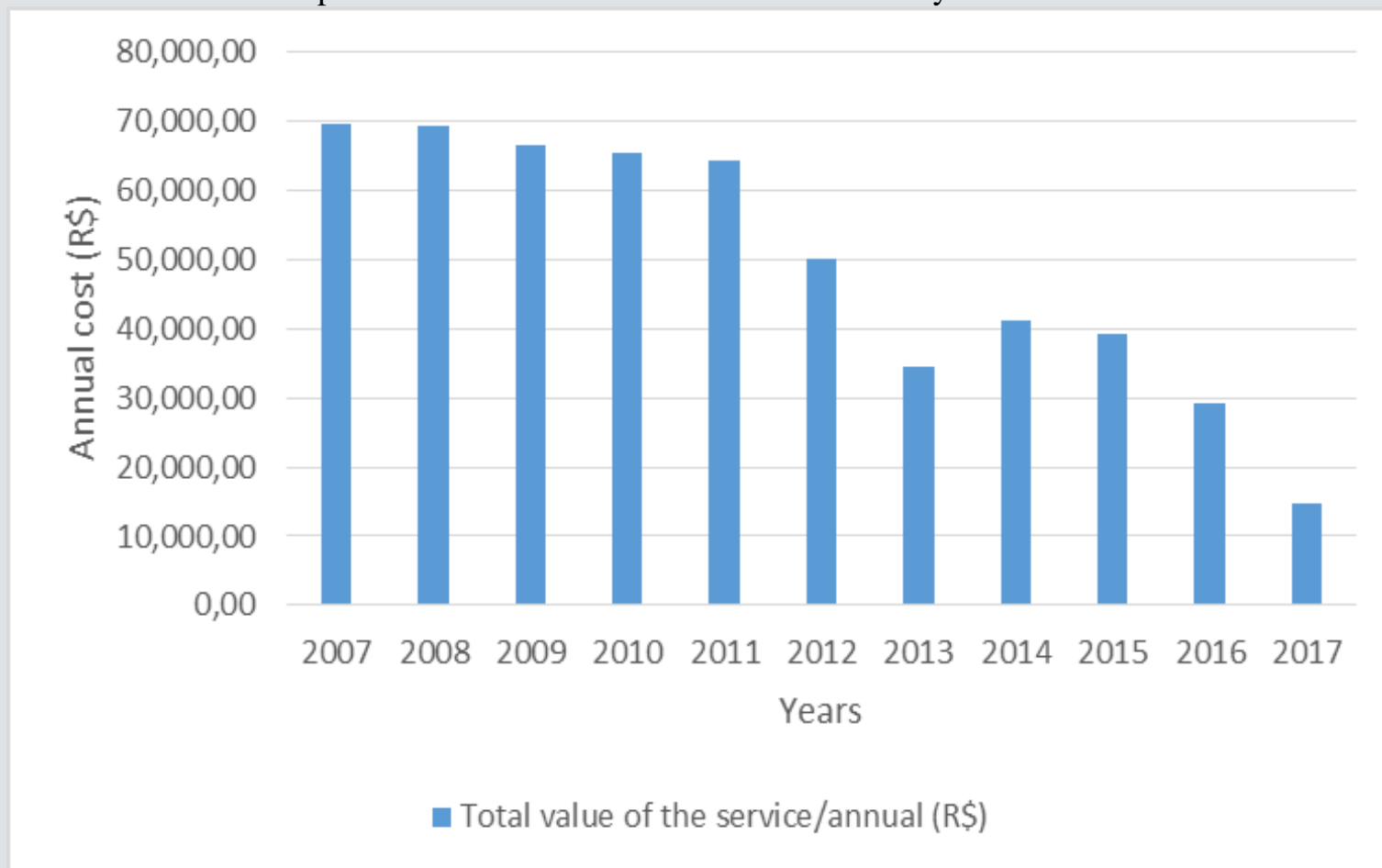
Graphic 1 - Annual expenditure on collection of non-recyclable waste.





The mitigation of funds destined to the collection of non-recyclable waste is observed in Graphic 2.

Graphic 2 - Annual cost on collection of non-recyclable waste.



CONCLUSIONS



- Economic advantage of R\$ 54.837,00 was found (78%).
- Reduction of 70% of the waste that is destined for final disposal

The economic benefit in ten years was R\$ 221.278,00 even considering the increase in collection service that cost R\$ 300.00 to R\$ 399.00.



The cooperative also had economic benefits, since the CDP became a permanent donor and the waste that is destined for the cooperative does not need sorting, because it already arrives separated and sanitized when necessary.



One of the greatest difficulties encountered at the beginning of the implementation of the policy for the separation of recyclable waste was with the company's own employees, since there are no public policies for selective collection in the cities, for daily practice in their residences. Cultural transformation is a difficult process, requires patience, persistence and in this case, convincing power.

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SECRETARIA DE PORTOS - SEP
COMPANHIA DOCAS DO PARÁ
Autoridade Portuária



CNPq

*Conselho Nacional de Desenvolvimento
Científico e Tecnológico*

Thank you!

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