

Cooperative Recycling as a Tool for Social Inclusion and Reduction of Urban Solid Waste

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Organizational Report

Purpose of the Study

- Show how solid waste, garbage collection and recycling are organized in Sorocaba City based on a particular case of study developed on Recycling Cooperative;
- Understanding the Organizational Obstacles;
- Understanding the Environmental, Economic and Social Aspects of the Cooperative;
- Show the Results of Cooperative Contributions to Sorocaba City;




Introduction

- The term “waste picker” was adopted at the First World Conference of Waste Pickers in Bogota, Colombia in 2008 to facilitate global networking.
- Waste pickers collect household or commercial/industrial waste. They may collect from private waste bins on the curb or from dumpsters, along the streets and waterways or on municipal dumps and landfills.
- Brazil is the only nation that systematically captures and reports official statistical data on waste pickers. Data collected by Brazil’s last official statistical system found over 229,000 people did this work in 2010. These waste pickers are responsible for the high rates of recycling in Brazil.



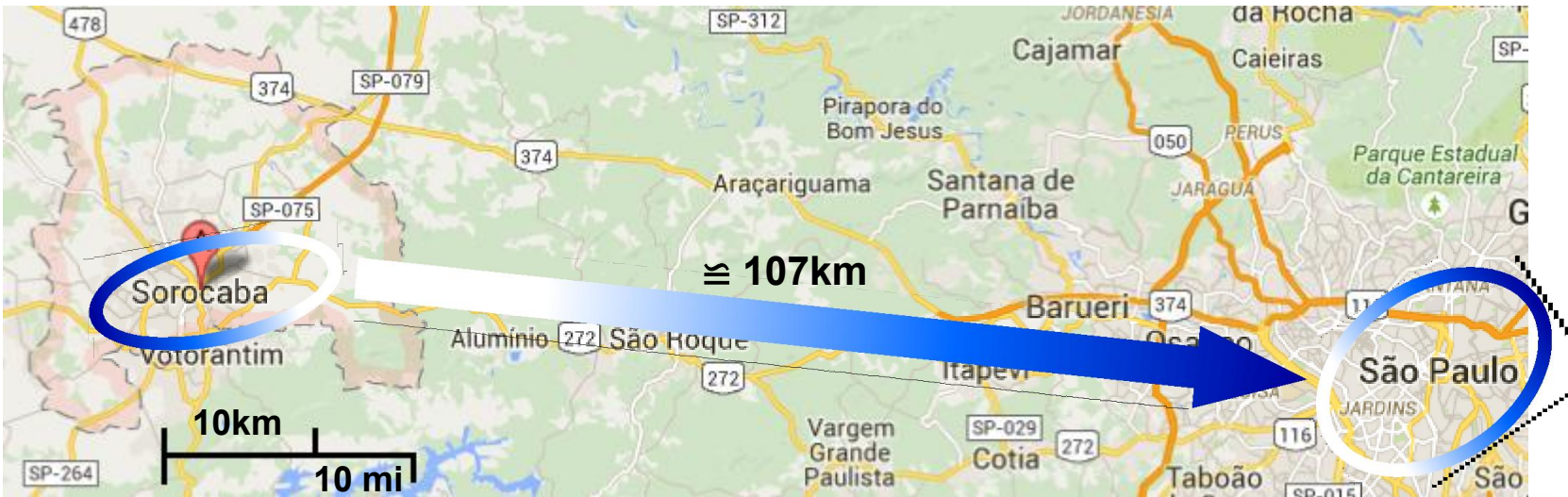
Introduction

- Recycling has been a Response to the Garbage or Solid Waste Problem;
- The amount of Collected Garbage/Solid Waste is split as the figures provided below:
 - 51% of waste goes to open-air dumps;
 - 49% goes to engineered landfill or Sanitary landfill;
- In Latin America & Brazil, Picking, Collecting and Separation have been Organized by:
 - (I) Autonomous Waste Pickers;
 - (II) Organized Waste Pickers;
 - (III) Contracted Waste Pickers (By Company or City Hall);

Most of them are unskilled workers!!
- Organized waste pickers working in Cooperatives is the best mechanism to promote this sort of activity, mainly in Latin America and Brazil as well, finding effective, sustainable solutions to preserve the environment for future generation. There is growing recognition that waste pickers contribute to the local economy, to public health and safety, and to environmental sustainability.



- Population (Estimated, 2014): 629,200;
- Eighth Largest City in São Paulo State;
- Industrial Park: around 1,600 (Automotive Parts, Tools, Heavy Metallurgy, Industrial Machinery, Agricultural Equipment, Wind Energy, Electronics and so on;
- Solid Waste/Garbage: 500 ton./day (Estimated , 2014);



Cooperative Structure

Central de Reciclagem Zona Oeste (CRZO)

- Total Area: 4,500 m²;
- Main Office, WC/Changing room and Kitchen/Small restaurant;
- 68 workers (April 2014);
- 5 Scales and 7 Hydraulic Presses;
- 1 Belt Conveyor
- 1 Forklift and 6 Hidraulic Lifts
- 9 Trucks (maintened by the city);
- Once a month, workers recieve training and lectures about health, hygiene and safety aiming to improve productivity and profitability.
- Workers also take part in courses (In partnership with Local University):
 - Basic Mathematics;
 - Literacy and Portuguese;
 - Household Finances;
 - Basic Computing;



Workers use PPE*

**Uniform;
Gloves;
Safety Glasses;
Safety Boots;
Apron;**

* Personal Protective Equipment



Cooperative Basic Problems

- Population does not separate waste properly;
- Low social status, little support from local governments and Industries;
- Workers have low skills and poor level of training;
- High rate of turnover;
- Most workers are former prisoners, drug users and mainly people segregated by Society;
- Inclusion of workers in Society in order to recover low self esteem;
- Some workers face difficulties to work in teams and do not meet the deadlines;
- Find a way to waste picking provides increase in the income and earnings;
- Waste pickers have semi formal status , but they are included in CBO* classification;

* CBO = Brazilian job classification used by Federal Government.



Improving the Cooperative Structure

2010: No control over the process (without any sort of Management and Cash Flow);

2011: Started to implement System and Procedures to Control the Processes;

2012: Ishikawa Diagram was Introduced;

- New equipments started to operate: Belt Conveyor and Hydraulic Presses;
- Logistical Study brought the best way to collect the garbage/solid waste;
- Local University started courses for workers training for career development and personal growth, an important factor in retaining workers;

2013: New Equipments: Forklift and Hydraulic Lift;

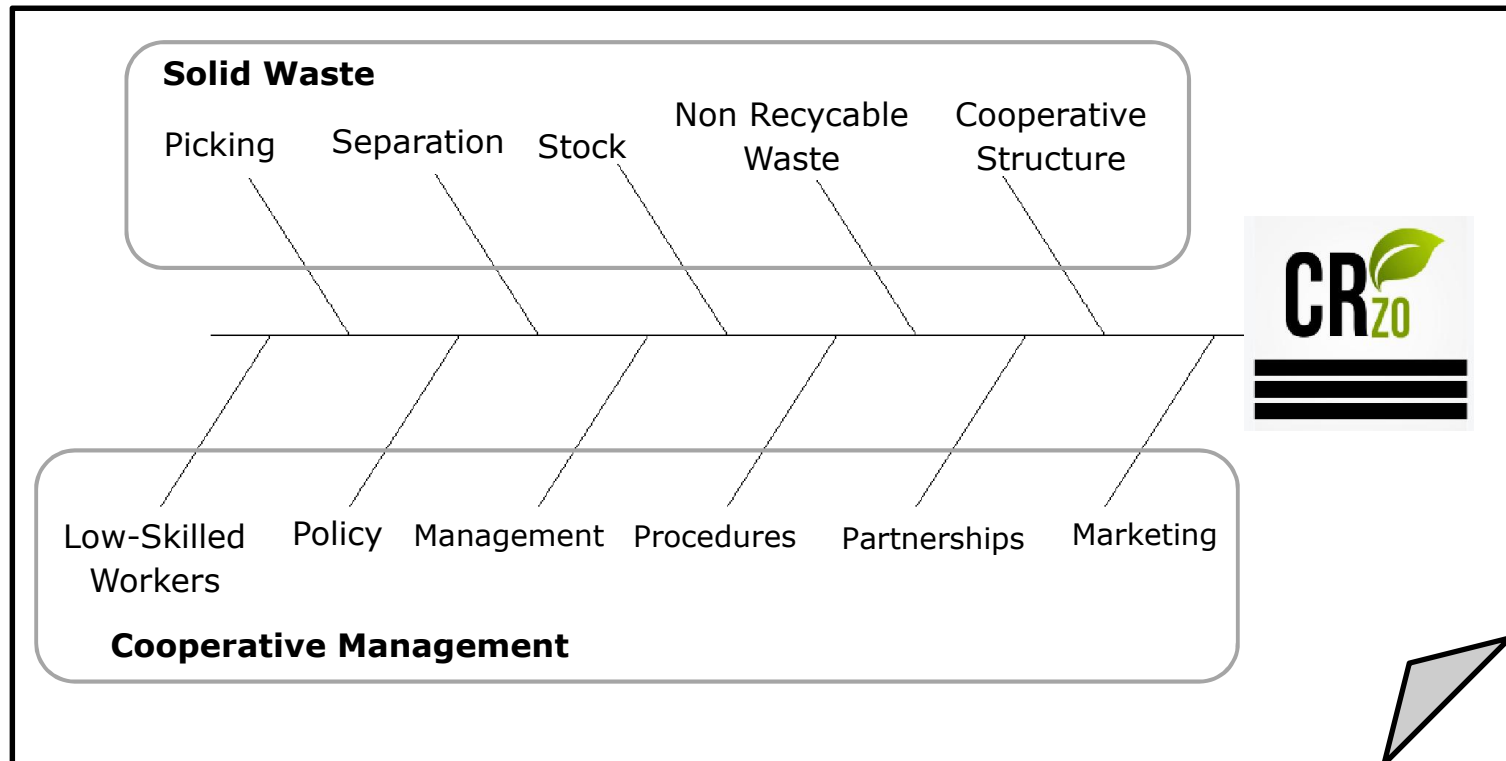
2014: Ishikawa Diagram was revised and updated;

2015: Start to Build WC/Changing rooms;



Improving the Cooperative Structure

Ishikawa Diagram



Pictures



Feeding the Belt Conveyor



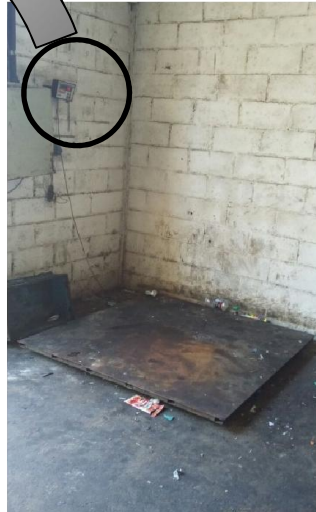
Detail of Garbage Picking on the Belt Conveyor



**Restroom/Changing Room
Reforming**



Pictures



Detail of Digital Scale



Detail of Equipments (Press, Folk-Lift)



Locker for Workers in the
Changing Room



Reforming the Bathroom
(Shower Room)



Filter and Cooler for Water
Drinker



Benefits and Results

Table 1. Total of solid waste/garbage collected in Sorocaba city by CRZO from 2010 to 2014.

Year	Total of Solid Waste Collected
2010 (Jan-Dec)	668.667 kg (aprox. 669 ton.)
2011 (Jan-Dec)	1,254.041 kg (aprox. 1.254 ton.)
2012 (Jan-Dec)	2,246.152 kg (aprox. 2.246 ton.)
2013 (Jan-Dec)	2,108.825 kg (aprox. 2.109 ton.)
2014 (Jan-Mar)	668.753 kg (aprox. 669 ton.)

Table 2. Average monthly income from 2010 to 2014.

Year	Average Monthly Income /Worker
2010 (Jan.-Dec.)	R\$ 785,29 (aprox. US\$ 261.00)
2011 (Jan.-Dec.)	R\$ 895,01 (aprox. US\$ 298.00)
2012 (Jan.-Dec.)	R\$ 1.022,55 (aprox. US\$ 340.75)
2013 (Jan.-Dec.)	R\$ 1.207,33 (aprox. US\$ 402.50)
2014 (Jan.-Mar.)	R\$ 1.409,49 (aprox. US\$ 469.30)



Benefits and Results

- Sorocaba pays for disposal of the garbage and solid waste in landfill. This operation costs around R\$ 161.00/ton. (aprox. US\$ 55.00/ton);
- The action of CRZO has brought benefits and cost savings to Sorocaba City;

Table 3- Amount of solid Waste collected by CRZO and the amount of money saved by avoid to diposal the garbage on landfill.

Ano	Amount of Solid Waste*	Saved Money
2010 (Jan-Dec)	558.5 ton.	R\$ 89,819.50 (Aprox. US\$ 29,940.00)
2011 (Jan-Dec)	1,103.5 ton.	R\$ 177,663.50 (Aprox. US\$ 59,221.00)
2012 (Jan-Dec)	1,855.7 ton.	R\$ 298,767.70 (Aprox. US\$ 99,589.00)
2013 (Jan-Dec)	1,976.6 ton.	R\$ 318,232.60 (Aprox. US\$ 106,078.00)
Total (2010-2013)	5,494.3 ton.	R\$ 884,582.30 (Aprox. US\$ 294,861.00)



Overview

- Recycling work is mainly carried out by waste pickers who are part of the informal economy and it is a survival strategy although greater formalisation and inclusion is occurring and there is growing recognition that waste pickers are considered environmental and economic contributors;
- Government and NGO have been supporting the cooperative activities, however such commitment is not enough to bring new perspective and social inclusion for the workers;
- Simple Methods and Management Process can be resulted in Quality improvement and can increase the income of the workers;
- Cooperative has been contributing to minimize de Solid Waste/Garbage issues;
- These actions have increased the performance of the process, and the profitability of workers, doubling the monthly income compared to 2011 and indirectly also contributed to improve self-esteem and the relationship of members.



Thank You!!!!



