

RECYCLING MUNICIPAL SOLID WASTE IN BRAZIL: CHALLENGES AND OPPORTUNITIES FOR EXPANSION

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Inclusive and Solidarity Recycling Observatory



**Núcleo AlterNativas
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CNDDH – Brazilian Centre of Human Rights

DRS/BB-MG



A policy-action oriented Network geared to build solutions towards waste recycling as a social and environmental alternative to urban waste treatment building from theoretical and practical knowledge.

Brazilian Urban Waste Management Context



- A new National Law and rules (Brazilian National Law for Waste – Law nr. 12 305/2010 - not fully implemented):
 - ✓ integrated waste management with waste pickers included in the system;
 - ✓ waste hierarchy;
 - ✓ regional solutions to final disposal;
 - ✓ shared responsibility on life cycle of products, (included packaging) – reverse logistics;
 - ✓ polluter-pays principle – rarely implemented...;

Brazilian Urban Waste Management Context (2)



- Waste collection at 98,7% of households (IBGE, 2010) but 6,2 ton/year of waste not collected and 42% of total waste are disposed irregularly (ABRELPE, 2011);
- Waste generation grows more than the population growing (ABRELPE, 2011);
- 50% Urban Waste are organics, 30% are recyclable: 80% of these are plastics (7,5 mil ton/yr), paper, cardboard and tetrapak (7,3 mil ton/ano)(ABRELPE, 2011);

Production Chain of Recyclable Waste



Proportion of recycled materials on selected Brazilian industry activities

Year	Aluminium Can	Paper	Glass	PET	Steel Can	Tetrapak
1993	50,0	38,8	25,0	-	20,0	-
1994	56,0	37,5	33,0	18,8	23,0	-
1995	62,8	34,6	35,0	25,4	25,0	-
1996	61,3	37,1	37,0	21,0	32,0	-
1997	64,0	36,3	39,0	16,2	33,0	-
1998	65,2	36,6	40,0	17,9	34,0	-
1999	72,9	37,9	40,0	20,4	37,0	10,0
2000	78,2	38,3	41,0	26,3	40,0	15,0
2001	85,9	41,7	42,0	32,9	45,0	17,0
2002	87,0	43,9	44,0	35,0	49,5	17,0
2003	89,0	44,7	45,0	43,0	47,0	20,0
2004	95,7	45,8	45,0	47,0	45,0	22,0
2005	96,2	46,9	45,0	47,0	44,0	23,0
2006	94,4	45,4	46,0	51,5	49,0	24,2
2007	96,5	43,7	47,0	53,5	49,0	25,5
2008	91,5	43,7	47,0	54,8	46,5	26,6

Consistent growth of material recycling: 7,1 millions of ton. in 2008; 375.000 people occupied on recycling industry versus 150.000 in 1999 (IBGE, 2008);

Metodology



- Objective: to understand Brazilian productive chain of recyclables, and bottlenecks to increase the scale and the value of recyclables' sales.
- Paper, HDPE, LDPE,PP, PET e PS represents 79,26% of waste pickers income (IPEA, 2012): quantity and market demands;
- Bibliography research and technical visits in companies that buy/ sell recyclable material and their clients on all five Brazilian geographical regions (beginning: waste pickers' cooperatives) : 73 institutions, 69 enterprises and 4 sector representative entities;
- Enterprises of different sizes: formal, informal and social/ solidarity ones;

Recyclable Waste – Supply chain



- Spray generation: PET, HDPE, white paper IV – households; LDPE, white paper II, paperboards – supermarkets, shops, public institutions;
- Not all recyclables are recycled because of lack of market – depends on the geographical region;
- 17% of Brazilian municipalities do Selective Collection, concentrated at richest regions, most of them partial and poorly organized (IBGE, 2011);
- Production chain formed by private, public and informal actors;
- Waste pickers are responsible for 90% of the recycled material that reaches factories, they are accountable to increase for 12% the amount of Brazilian urban waste recycled. (Valor Econômico, 2010, p.28 e p.43);
- 1200 waste pickers' cooperatives in Brazil (IPEA, 2012);
- Decision of collecting recyclable depends on the market value;
- A work intensive activity, appropriated for countries with unskilled workers, useful to reduce poverty.

REC T1

WASTE PICKERS,
COOPERATIVES,
PUBLIC SORTING
PLANTS

- Collection
- Screening
- Packing
- Trading
- Transport

REC T2

INTERMEDIARIES,
WRECKER, BROKERS,
WASTEPAPER
WHOLESALEERS

- Screening
- Sorting
- Packing
- Marketing
- Transport

REV

SEMI-
MANUFACTURED
INDUSTRY

- Screening
- Washing
- Milling/flakes
- Extrusion/ pellets
- Dissolution
- Depuration
- Pulp modelling/
drying
- Marketing

TRANSF

MANUFACTU-
RED
INDUSTRY

- Different manufacturing processes
(extrusion, injection, blowing, drying, compression, etc)

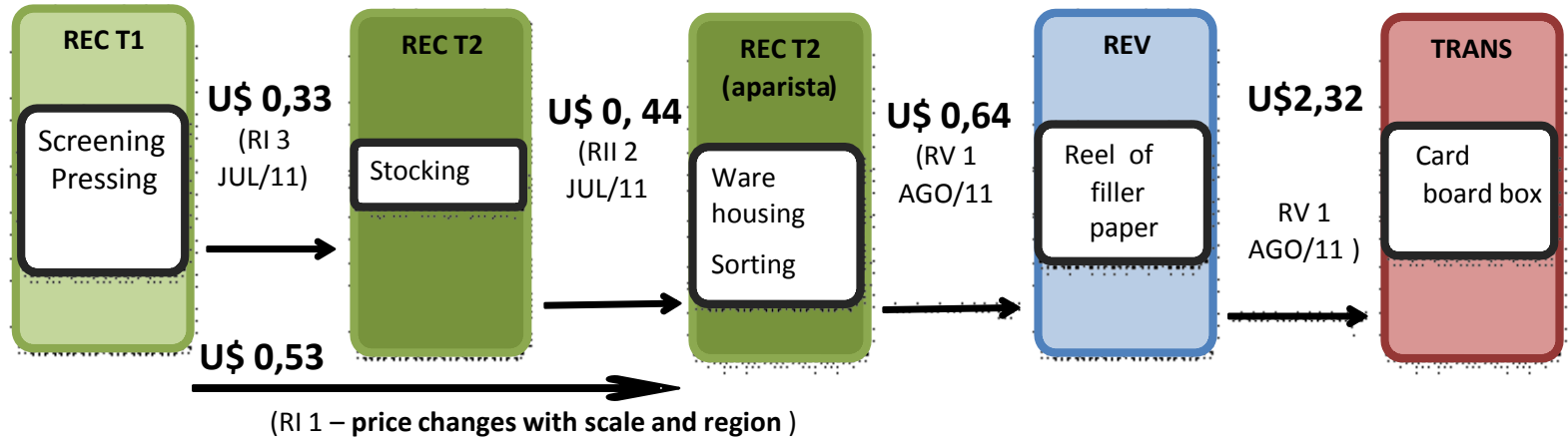
PLASTICS

PAPER

PLÁSTICS
(flakes and pellets)

PAPER(paper board)

Value Chain Paperboard :



	REC T1	REC T2	REC T2	REV/TRANS
Size	Micro	Micro/Small	Small	Medium/Large
Average productivity	2,5 t/mth/worker	5,9 t/mth/ worker	85 t/mth/worker	>20 t/mth/worker
Processes/ activities	Gathering, sorting and bandling	Stock and transport	Sorting, classification, contaminants removal, bandling and transport	Sorting to contaminants removal and manufacturing

State	Recycling Ind.
Amazonas	2
Bahia	4
Ceará	2
Goiás	1
Maranhão	1
Minas Gerais	14
Pará	1
Paraíba	2
Paraná	20
Pernambuco	3
Rio de Janeiro	7
Rio Grande do Norte	1
Rio Grande do Sul	9
Santa Catarina	24
São Paulo	40
Sergipe	1
Total Brasil	132



Fonte: BRACELPA

The largest Paper Industry are located in São Paulo, Paraná, Santa Catarina and Bahia states. There are small factories, that consume recycled fibers, in almost all regions of Brazil.

Plastics recycling



- 11.524 plastic transformers, most of them micro/small and informal firms – 72,5% employ up to 20 workers (ABIPLAST, 2012)
- 68% of recycled raw material come from post-consumer material
- Seasonality in the raw material supply and in the granulate purchase, prize of recycled raw material related to virgins termoplastic resins(max. 80%)
- Recycled plastic used in secondary markets: poor quality goods, low technical specification and value- home and office utilities, packaging, etc.
- 30% idle capacity at Brazilian plastic industry (ABID, Plastivida,2008)
- Better regional distribution than paper industry

Conclusions



- Most important bottleneck is Selective Collection of urban waste:
 - Lack of some materials, most of recyclable waste still being landfilled: industry claims about scale;
 - Recycled material quality depends on waste segregation at the source: industry claims about continuous supply and quality
 - Waste recycling is primarily a question of the distribution channels management, high cost of collection, sorting and transport;
 - Avoid technologies that compete with recycling as incineration

It is necessary to invest on information and to invest on Selective Collection made by waste-pickers – Social Technology of Solidarity Selective Collection brings more technical and economics efficiency (Rutkowski, *et al*, 2013 –ISWA 2013 Congress)

Conclusions



- The geographical concentration of recycling industry diminishes recyclable material prices, does not allow trading some materials and justifies the action of intermediaries firms– recycling industry needs scale and quality; it used to pay its clients after 30/45 days, time that waste pickers can't wait...
- A segmented and oligopsonic market with several actors that plays different roles and have specific needs.
- Many informal actors and great variation on recyclable material prices with raw recycled materials prices linked to commodities prices.
- Waste pickers cooperatives organized on social and solidarity economy, productive chain organized on capitalist principles : it is necessary to build strategies and tools to allow this dialogue/relationship;

Conclusions



- **Public programs to promote waste recycling :**
 - Define stable ways to cover selective collection costs and to pay for the urban environment services that waste pickers do: garbage collection fees, reverse logistics, public funds...;
 - Improve design to recycling ;
 - Implement technological services and tax benefits to induce plastic and paper industry to use recycled raw material: Brazilian celulosis production cost is one of the lowest in the world(BNDES,2011) what discourage using recycled fibers;
 - Public support to improve waste pickers organizations and to regulate the recyclable waste market – sustainable procurement- ISO CD 18617.2, new rules for fees;
 - To understand how the international recycling markets works and how to play on it....



Thank you for attention!

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Special thanks for:

FBB – Bank of Brasil Foundation that funded the research

To our partnership:

Núcleo Alternativas de Produção do DEP/UFMG

INSEA

MNCR – Brazilian Waste Pickers National Movement

