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Briefing: Social facets of solid waste: insights from the global south

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Most commonly municipal solid waste is being treated from an engineering and technological perspective only and is either perceived as a nuisance or a commodity, while the social facets permeating waste issues are less prominent in this debate. Conceptualising waste as being worthless and yet also a coveted resource reveals a central contradiction affecting waste, which surfaces in solid waste management decision making. The complexity of current waste problems requires an integrated, multifaceted and interdisciplinary approach that is aware of the social side of materials. Production, consumption and lifestyle habits generate waste, which is part of the current, global environmental crisis. Reduction and recovery of recyclable materials address the serious ecological 'overshoot' concern of this crisis. Informal but organised recycling in Brazil is discussed as an innovative form of an inclusive resource recovery and environmental awareness strategy. Public policies need to safeguard the social dimension in addition to the ecological and economic aspects in waste management.

1. Introduction: waste generation, lifestyle and consumption

Waste is associated with unwanted materials or products and with articles whose life span is considered to be over. Definitions for the term waste range from 'all material unwanted by the generator' (Statistics Canada, 2005: n.p.) and 'any substance or object . . . which the holder discards or is required to discard' (EC, 2006: p. 5) to waste as a resource recovered through reuse and recycling or as a culturally determined material perception (Pongracz and Pohjola, 2004). According to Gregson and Crang (2010: p. 1027) 'waste is seen as historically mutable, geographically contingent, and both expressive of social values and sustaining to them'. The waste humankind generates now has increased in volume, is complex in material composition and bears associated health risks. Consumption generates direct and indirect environmental impacts of variable magnitudes during manufacturing, transportation and after disposal.

Currently humans generate more waste than ever, not only owing to population growth but as a consequence of increased consumption and discard levels, particularly among the economically well off. Global plastics production in particular has grown from 1·5 million t per year in 1950 to 245 million t in 2008 (European Commission, 2011), turning into a global problem. Waste becomes a nuisance when proper treatment is lacking or in the absence of waste prevention strategies, resulting in serious challenges for municipal governments. All techniques of waste treatment generate some form of environmental impact, releasing toxins and greenhouse gases, for example methane landfill emissions and dioxin/furans emissions from waste incineration and landfill leachate or toxic ashes as final residue of waste-to-energy incineration. Although recycling and reuse also generate environmental impacts, when requiring energy and water, virgin resources are spared with these forms of waste diversion. All other modes of waste management require continuous extraction of new raw materials to maintain the production/consumption cycle.

Waste management in the sense of treatment following linear techno-economic, end-of-pipe approaches usually falls under the domain of engineering, while concerns in the social sciences are more often related to environmental policy, environmental education or urban planning and making visible the social facets of waste. Daly (1996), Layard (2005), Victor (2008) and others were alert to the current systems crisis generated by the doctrine of unlimited economic growth, manifested in persistent poverty rates and increasing levels of global environmental degradation and collapse of life systems. According to Schor (2010) we have already hit the 'ecological overshoot', with humans consuming more than the earth's available capacity to generate a continuing supply of resources and to absorb the wastes generated. A one-sided technocratic stance does not elucidate all the other aspects related to waste nor does it present a sustainable solution to the problem.

2. Social theory contribution to solid waste management

Given the outlined scenario it is critical to reduce the generation of waste and to recover all resources embedded in discarded materials. The attention in this briefing paper is primarily on municipal solid waste, which is just the tip of the iceberg, since most waste is generated during industrial production, agriculture and construction activities. Avoidance and more responsible consumption indirectly tackle these other fields of waste generation. Hence the logical consequence to address the waste dilemma is also through responsible consumption, which means taking into account environmental and social impacts from production, transportation and discard when deciding what and how much to consume.

Not generating waste in the first place, as suggested by *On the Road to Zero Waste* (GAIA, 2012), and to focus on reuse and recycling seems a natural conclusion and yet it is the most difficult adaptation for society. In order to voluntarily alter consumption habits and to participate in resource recovery programmes, reliable information and creative forms of knowledge mobilisation and environmental education are required. Voluntary lifestyle changes and refusing/reducing the generation of waste are attitudes that contribute to zero waste but they need to be embedded in policy-directed strategies.

Resource recovery creates jobs in selective waste collection, education and recycling. Reuse and recycling generates far more employment than landfilling and incineration. According to Tangri (2003), the reuse of 10 000 t/year of materials employs respectively 296 workers in the reuse computer sector, 85 in the reuse textile sector, 18 in the paper recycling sector, 26 in glass recycling and 93 in plastic recycling. In comparison, incineration and landfill create only one job per 10 000 t of material incinerated or landfilled per year.

Including different stakeholders from civil society (non-government organisations (NGOs), university, community groups) and recycling business in the design of waste recovery and consumption strategies/policies is crucial to achieving a new perception on consumption and waste. Examples from the global south reveal the contribution of organised, cooperative recycling and the importance of these stakeholders participating in the construction and adaptation of waste management programmes and policies. Inclusive waste management has developed in Brazil as a concept based on principles of a solidarity economy (Gutberlet, 2009, 2012), with the purpose of valuing and empowering the workers involved, ultimately aiming at reduction, reuse and recycling, addressing responsible lifestyles and the refusal to waste resources in general (Barr and Gilg, 2006).

3. The benefits of cooperative recycling programmes

Informal selective waste collection is common in the global south. Part of this activity happens in organised cooperatives or associations with or without municipal support. Sometimes these groups add value to the materials collected and separated by creating new products, for example recycled paper products, washing lines from PET (polyethylene terephthalate) bottles, roof tiles and furniture from multi-layer plastic/carton/aluminum foil packaging (Gutberlet, 2012). In Brazil approximately 800 000 people are involved in informal recycling, and often also in cooperative recycling. Most of these individuals live in poverty and work under hazardous conditions.

Although the activity of selective waste collectors, who in Brazil are termed *catadores* is a recognised profession according to the Brazilian classification of occupations (Classificação Brasileira de Ocpações) most work still remains informal. Not all cooperatives or associations are formalised and not all of them have access to the workers' rights as provided for by legislation. Recently, regional cooperative networks have emerged to promote collective commercialisation and engage in other collective actions (Singer, 2003).

The resource recovery rate per recycler and per cooperative varies depending on the quality of material separation at the source, transportation mode, infrastructure equipment at the processing centre where separation, baling and storage happens, topography and distances of the serviced neighbourhood, and level of training, among others. On average, a recycler carries up to 200 kg of recyclable material per day, which adds up to approximately 4 t/month (Conceição, 2005). Working hours are long, often 12 h/day, pushing a cart by foot an average distance of 20 km/day. It is estimated that informal and organised recyclers recover 60% of the paper and cardboard that are recycled in Brazil and up to 90% of all materials that feed the recycling industry in Brazil. Conceição (2005) estimates that informal and organised recyclers recover up to 20% of the municipal solid waste generated in urban Brazil.

Recyclers who are part of a cooperative or association and are supported by the local government often experience previously unknown opportunities for human development, training and education. These experiences have contributed to build leadership and to empower the recyclers, thereby playing an important role in the restoration of full citizenship (Tremblay and Gutberlet, 2011). Participants have a say in decision-making processes within their cooperative and in stakeholder meetings to negotiate with government and business. Cooperative leaders participate in public events, conferences and exhibitions. These practices further empower the recyclers and open new avenues for social development (Couto, 2012).

Most important, cooperative-run selective waste collection schemes generate social capital by incorporating these individuals into meaningful work. The recyclers regularly visit households to collect recyclables and inform them about recycling and other environmental education issues. They contribute to the improvement of the neighbourhood, cleaning up waste materials and demonstrating resource recovery behaviours, and thus create opportunities for greater community cohesion. This detail has been widely observed in the case of Brazil and other countries (Medina, 2010), as discussed also by Zapata Campos and Zapata (2013) for the case of Nicaragua. Often recyclers are invited to speak at schools, community centres and universities, thereby educating the public about waste and their practices in recovering resources.

The new federal solid waste legislation (Política Nacional de Resíduos Sólidos law No. 12.305, of 2 August 2010) provides opportunities for municipalities to collaborate with recycling groups in waste diversion (Legislação Federal do Brasil, 2010). The policy requires municipalities to adopt selective waste collection and composting. It supports the involvement of *catadores* in actions for shared responsibility for product life cycles (as specified in chapter 11, article 6, XII in the referred national solid waste legislation) and prioritises recycling cooperatives in formal recycling programmes (as to the objectives and principles outlined in chapter II of the federal law). The same legislation also allows for waste-to-energy incineration, which for the national recyclers' movement is clearly not compatible with their approach to solid waste. Currently this has created conflicts in several cities, where manifestations by the recyclers and other supporters promote selective waste collection and recycling over waste-to-energy. The contested nature of waste incineration has been discussed by several authors, including: Corvellec *et al*. (2012), Ngoc and Schnitzer (2009), Rocher (2008) and Shekdar (2009).

Incineration might be an effective way to reduce the volume and weight of waste, but it is very expensive and destroys materials that could generate new products, create employment and spare natural resources. The recyclers' movement is increasingly becoming more aware about zero waste and they recognize that waste-to-energy does not provide incentives for zero waste behavior. The contested nature of waste-to-energy has been discussed by many authors, including: Corvellec *et al*. (2012), Gutberlet (2011), Ngoc and Schnitzer (2009), Rocher (2008), Shekdar (2009), Themelis and Millrath (2004) and Weaver (2005).

Among the hurdles still to be overcome are: extreme poverty and socioeconomic vulnerability of the *catadores*; lack of political will of local government to include the recyclers in their waste management programmes; the threat from corporate waste management, including waste-to-energy schemes; low remuneration for selective waste collections; and the lack of financial resources of organised groups.

4. Conclusion

Set in the context of the global south, this briefing paper draws attention to the benefits of engaging recycling cooperatives in resource recovery. Including *catadores* and their equivalents elsewhere in the collection, separation and transformation of recyclable material and in the re-education of consumers presents an opportunity to recover their livelihoods. Furthermore, as environmental stewards they are able to make groundbreaking contributions through educating and disseminating information regarding waste reduction, resource recovery and social benefits of organised, selective waste collection.

A bottom-up approach to achieving sustainable communities is suggested, where citizens become responsible consumers, concerned with avoiding and reducing waste, and providing an appropriate final destination for those materials that need to be discarded. Inclusive resource recovery generates income and addresses poverty mitigation (one of the United Nations millennium development goals). Moreover, inclusive waste management targets a reduction in public spending on conventional waste management practices and generates carbon credits.

The benefits from recycling translate into greenhouse gas reduction and ultimately into climate change mitigation by recovering materials that would otherwise end up in landfills, generating detrimental gases and leachate (Sunil *et al*., 2004). An additional benefit derives from the fact that reuse and recycling reduces the pressure on natural resources, diminishing environmental damage and contamination (Troschinetz and Mihelcic, 2009).

Appropriate practices and efficiency in logistics and scale are fundamental to reduce the ecological footprint of resource recovery practices. Organised selective waste collectors, such as the *catadores* in Brazil, contribute to these benefits. Capacity building for effective and efficient resource recovery, adaptive policy design and public awareness building for efficient stakeholder collaboration in source separation are all critical and should be addressed with research. Community engagement, environmental stewardship and social economy can take endless creative and different forms, according to specific local settings. The organised activity of the *catadores* is an important catalyst for waste reduction, zero waste and the creation of a more balanced and responsible society.

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