International Guest Statement

Action-Oriented Research on Community Recycling in São Paulo, Brazil

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With more than half of the world's population already living in urban spaces, increased generation of solid waste is a serious global concern. Appropriate solid waste management is an effective measure for building more sustainable communities and for increasing urban resiliency. Improper forms of disposing solid waste cause harm to the environment and to the climate. Waste can also be a resource. By not recovering the resources embedded in waste the prevailing unsustainable exploitation of natural resources may continue. My research concerns are closely related to building more sustainable communities. I focus particularly on solid waste recovery and recycling as livelihood options to achieving this goal. Since 2005 the Participatory Sustainable Waste Management (PSWM) project—hosted by the Community-Based Research Laboratory at the University of Victoria—has helped recycling co-operatives in the metropolitan region of São Paulo, Brazil, to become more resilient, through empowering their participants, increasing their income, supporting inclusive public policies, and building environmental awareness.

Participatory sustainable waste management means 'solid waste recovery, reuse and recycling practices with organized and empowered recycling co-ops supported with public policies, embedded in solidarity economy and targeting social equity and environmental sustainability' (Gutberlet, 2009: 171). This approach facilitates the cyclical use of resources and spares virgin materials from being extracted. This form of resource recovery happens worldwide, particularly in the global South, where it generates work and employment among the most vulnerable populations. Improving the working conditions of the recyclers and expanding the resource recovery activity ultimately translate into stronger local economies and overall reduced social vulnerability, thereby leading to more sustainable communities.

In Latin America, Asia, and Africa, in particular, an extensive informal sector is involved in collecting and separating recyclable materials from the waste stream, providing an insight into their resourcefulness (Moreno-Sánchez and Maldonado, 2006). In Brazil approximately 800,000 to 1 million people engage in this activity, yet most of them remain extremely poor and marginalized.

The research that my graduate students and I undertake has revealed the diverse ways in which these informal collectors are redefining waste as a resource (Gutberlet, 2008; Gutberlet and Baeder, 2008; Tremblay et al., 2010). This research points to positive change through community-led recycling as a poverty reduction strategy that also improves environmental health.

We have recently investigated the potential for integrating organic waste management with urban agriculture, thereby further reducing the volume of waste going to landfills and returning valuable nutrients to depleted soils (Yates and Gutberlet, 2011). The majority of the organized recyclers in Brazil, and particularly their leaders, are women. The activity provides them with opportunities for income generation and allows for their capacity-building and collective engagement. Co-operative recycling thus makes an important contribution to the human development of those who are impoverished and socially excluded from society. The researchers that are part of the PSWM project engage in community outreach activities, help organize workshops or seminars, produce video documentaries, and conduct participatory and action-oriented research interventions in Brazil and in Canada. These activities have helped to increase the awareness among governments and communities about waste co-management issues and the need to decrease waste generation. Overall, the PSWM project illustrates the value of at-source separation in reducing waste. Lessons have been learned about how to inform policy-makers on sustainable and socially responsible waste management, lessons that need to be disseminated to further influence legislation and policy. The use of video in our research has played an important role to empower the participants and to inform the public and the local politicians about the work of the recyclers and their livelihood concerns (Tremblay et al., 2010).

A major threat to community recycling is the 'waste to energy' scheme, where solid waste is incinerated to extract energy (Gutberlet, 2010). Not only does this form of waste management cause environmental hazards, but it also dismisses the fact that resource recovery and recycling are more

Courtesy Jutta Gutberlet

Recyclers from Pacto Ambiental association in Diadema, Brazil.

socially and environmentally friendly, generate employment, and contribute to resource conservation. My current research aims to help build the arguments for more sustainable resources use and recovery. The findings will contribute to the design of solid waste policies that propel community building with zero waste, inclusive resource recovery, and more sustainable lifestyles.

Courtesy Jutta Gutberlet

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Figure 4.1 shows a generalized model of such a cycle. Like all the subsequent diagrams of cycles in this chapter, it exemplifies the types of simplifying models that scientists construct to try to represent the vast complexity of Earth processes, as described in Chapter 1 and illustrated in Fig 1.19. Nutrients can be stored in the different compartments shown in Figure 4.1 for varying amounts of time. In general, there is a large, relatively slow-moving abiotic pool that may be in the atmosphere or lithosphere and is chemically unusable by the biotic part of the ecosystem or is physically remote. There is a more rapidly interacting exchange pool between the biotic and abiotic components. Nutrients move at various speeds from the biotic to the abiotic pools. For example, very rapid exchange takes place through respiration as carbon and oxygen move rapidly between the biotic and atmospheric components. The elements that now make up your body have undergone millions of years of recycling through these various compartments. You are a product of recycling!

Ecosystems also vary substantially in terms of the speed of cycling and the relative proportion of nutrients in each compartment. Some systems have nutrient-poor soils, for example, and have developed different mechanisms to store nutrients in other compartments. Tropical forest ecosystems are classic examples. Most of the nutrients are stored in the biomass as opposed to the soil system (Table 4.2). When leaves fall to the ground, they are rapidly mined for nutrients by plant roots before those nutrients have a chance to be leached out of the system. In contrast, many temperate

Table 4.1 | Relative Amounts of Chemical Elements That Make Up Living Things

Major Macronutrients (>1% dry organic weight)		Relatively Minor Macronutrients (0.2–1% dry organic weight)		Micronutrients (<0.2% dry organic weight)	
Name of Element	Symbol	Name of Element	Symbol	Name of Element	Symbol
Carbon	C	Calcium	Ca	Aluminum	Al
Hydrogen	H	Chlorine	Cl	Boron	B
Nitrogen	N	Copper	Cu	Bromine	Br
Oxygen	O	Iron	Fe	Chromium	Cr
Phosphorus	P	Magnesium	Mg	Cobalt	Co
		Potassium	K	Fluorine	F
		Sodium	Na	Gallium	Ga
		Sulphur	S	Iodine	I
				Manganese	Mn
				Molybdenum	Mo
				Selenium	Se
				Silicon	Si
				Strontium	Sr
				Tin	Sn
				Titanium	Ti
				Vanadium	V
				Zinc	Zn

Source: Kupchella and Hyland (1989).