

# **Integrated Organic Waste Management:**

**Advancing Socio-Environmental Policies for Local Development in Diadema, Brazil**

by

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BA, University of Manchester, UK, 2004

A Thesis Submitted in Partial Fulfillment  
of the Requirements for the Degree of

**MASTER OF ARTS**

in the Department of Geography

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University of Victoria

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**Supervisory Committee**

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Dr. Margo Matwychuk (Department of Anthropology)  
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## Abstract

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Integrated organic waste management, based on the door-to-door collection and decentralised processing of organic waste for urban agriculture, can be conceptualised as a socio-ecological process of re-circulating environmental amenities for social equality and environmental sustainability. In this thesis, a framework for participatory integrated waste management is presented, based on the findings of an empirical study carried out in the Brazilian city of Diadema, in 2008. The results reveal that the capacity exists for the collection and processing of organic waste, while civil society is sufficiently mobilised to ensure a reliable supply of good quality food waste. The quantity and quality of the resulting fertiliser helps enhance community food security through direct production for self-provision, reciprocal distribution networks, and increased income generation. Barriers include conflict over land and insecure political support. Such insecure support is characterised by the paradox of Brazilian politics, whereby rhetorical support for social policies contrasts their neoliberal implementation. This thesis addresses the ways in which the national political paradox affects the potential for integrated organic waste management in Diadema, paying particular attention to the need for combined social and

environmental policies, the political culture of project implementation, the rhetoric of public participation versus neoliberal policy enforcement, and the contested nature of deliberative decision-making spaces. The thesis concludes with suggestions for progressive policy reform, such as a remuneration agreement with the recyclers and firm land tenure arrangements with the gardeners.

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## Acknowledgements

I am particularly grateful to the *catadores* of *Vida Limpa* and the community gardeners of *Fundação CASA* for their sustained interest in and commitment to the research. Their willingness to help as individuals and their drive to participate in the broader project was fundamental to the successful completion of the research in Brazil.

Fabíola Bonaldo Frank also deserves special acknowledgement for her support during the research. Without her, the many interviews, surveys, meetings, discussions, field trips, knowledge mobilisation exercises, public information publications, and logistical elements of the research process in Brazil would not have run so smoothly and effectively. I am grateful not only for her commitment to contributing to rigorous research, but also for her kindness and generosity in helping me penetrate the dense social network of São Paulo and navigate the many cultural obstacles that emerged. Likewise, I thank Clécio Varjão for his social and emotional support, as well as his constant feedback on my written and spoken Portuguese. Adriana Medina, Viviane Christina, and Alzira Varjão Toto also all deserve special thanks for welcoming me into their homes with open arms.

I am also grateful for the drive, determination, encouragement, and friendliness of all the Participatory Sustainable Waste Management (PSWM) staff in the São Paulo region, including Solange Dias de Araujo, Ruth Takahashi, Fabio Luiz Cardozo, Ana Maria Marins, Nídia Pontuschka, and Ângela Baeder. I also thank the many members of the Diadema government who lent their support.

There are also many in Canada who helped to keep the research on-track. Particularly, my supervisor Dr. Jutta Gutberlet deserves recognition and credit for her steadfast commitment to enhancing equality and equity in Canada, Brazil, and beyond. Her guidance throughout the research process was invaluable, and her passion and motivation always encouraging. I also thank Dr. Stephen R. Tyler and Dr. Margo Matwychuk for their support and insightful comments throughout the research process. My gratitude also extends to Bruno Jayme and Maria Luiza Souza for their help with the interviews in Portuguese. I am grateful for the emotional support of Bethany Coulthard, with whom the many supportive Skype conversations helped me to maintain a positive frame of mind during the harder times in Brazil. Finally, I thank my parents for the support they have provided, which enabled me to migrate temporarily to Canada for the purposes of this research.

# 1 Introduction

## 1.1 The urban problématique

In 2007, the global demographic scales tipped – for the first time, the world’s urban population equalled that of rural areas and the number of slum dwellers throughout the globe reached one billion (UN-HABITAT, 2006).<sup>1</sup> In Latin America, an estimated 134 million people live in slum conditions, and with an estimated 51.7 million slum dwellers living in just 2.5 million households, Brazil contains the third largest absolute number of slum dwellers on the planet (Davis, 2006; Frediani, 2007; UN-HABITAT, 2006). The metropolitan region of São Paulo alone houses an estimated 6 – 8 million slum dwellers (Davis, 2006), and in Diadema, more than a quarter of the city’s population now lives in slum conditions (Secretariat of Housing, 2008). The result is that “urban inequality in the Third World is visible even from space” (Davis, 2006, p. 95).

Although the poor also stretch beyond the administrative and typological boundaries of slums (UN-HABITAT, 2003), there remains a concentration of depravation at the margins of Brazilian cities. In metropolitan São Paulo, the population of fast-growing peri-urban areas grew at a rate of 8.1% per year during the 1990s (Torres, Alves, & Oliveira, 2007). Diadema is no exception; the city’s population has grown by 13.2 per cent since the turn of the century (IBGE, 2007), forcing socially and economically excluded urban dwellers to occupy the margins of Lake Billings – a protected drinking-water catchment that occupies 23.3% of the city (Gutberlet, 2006). Such an invasion of

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<sup>1</sup> UN-HABITAT refers to a slum as “a multidimensional concept involving aspects of poor housing, overcrowding, lack of services, and insecure tenure” (2003, p. 1).

peripheral greenbelts transforms these areas into ecological hazards, as “*favelization*” around valuable reservoirs and watersheds transfers health risks to the rest of the population (Galvão, 2003). Thus, as Davis puts it, the “principal function of the Third World urban edge remains as a human dump. In some cases, urban waste and unwanted immigrants end up together...in... ‘garbage slums’ ” (2006, p. 47).

In Brazil, the concentration of waste at the urban fringe is exacerbated by a centralised waste management system that is characterised by a Malthusian dilemma of increasing waste production and decreasing space for disposal. In São Paulo, municipal solid waste (MSW) production increased by over 23% in between 1991 and 2001 (Gutberlet, 2008b), and only 237 of the 5,507 municipalities in Brazil practiced selective waste collection in 2004 (Mancini, Nogueira, Kagohara, Schwartzman, & Mattos, 2007). In metropolitan São Paulo, 92.4% of the 250,000 tons of waste collected in 2000 was directed to landfills. Of the municipal dumping sites, 26.7% were near to households, 10.0% were adjacent to environmentally protected areas, and 6.7% were close to areas of agricultural activity (IBGE, 2002). Furthermore, 57.5% of the MSW dumped in these locations is biodegradable food waste (FW) (IBGE, 2002). The uncontrolled biodegradation of FW presents environmental and health hazards, such as the leaching of toxins to soil and water, slope failure through static liquification, and increased greenhouse emissions (Blight, 2008; Kong, 2008; Meyers, McLeod, & Anbarci, 2008; Sharma, Meesa, Pant, Alappat, & Kumar, 2008). In Brazil, the production of urban FW is predicted to rise from 16 billion kg in 2005 to over 22 billion<sup>2</sup> kg in 2025 (Adhikari, Barrington, & Martinez, 2006). With a concentration of waste in the urban periphery,

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<sup>2</sup> The short-scale billion ( $10^9$ ) was used here.

marginalised urban dwellers must cope with the environmental and health hazards of such increases. These “socially excluded people and excluded spaces in the periphery” (Gutberlet, 2006, p. 3) are devoid of the social services and legal measures that are required to ensure social, economic, and environmental equality. The result in terms of waste management is inefficient and unequal collection, coupled with improper disposal.

Ironically, while waste accumulates in peripheral cities such as Diadema, the centralised food system in Brazil means that access to fresh fruit and vegetables is both difficult and costly. Diadema is an industrial city where agriculture accounts for 0.04% of gross domestic product (IBGE, 2007), and the majority of food must be imported. Food security, therefore, is determined by financial wealth, and the urban poor tend to survive on storable food stuffs that are affordable yet low in nutritional value. Despite the fact that Brazil contains 26% of the world's cultivable land and is the second highest exporter of food, the under-developed local fresh fruit and vegetable market means that urban dwellers continue to consume less than the Food and Agriculture Organisation's established daily minimum caloric needs and nutritional diversity (Oths, Carolo, & Santos, 2003).

This thesis explores an avenue to address the inequity and inequality associated with the linear model of waste management and centralised food system in Brazil. Integrated organic waste management, which links decentralised organic waste collection with urban agriculture (UA), is presented as a means to simultaneously address the problem of waste accumulation and the dearth of local food production at the urban periphery. Such an integrated system is contextualised by contradictory responses to the inequitable and unequal urban conditions in Brazil. On the one hand, there exists a

grassroots movement to re-define local waste management and food production systems, while on the other hand the state response remains largely ambivalent to the socio-environmental problems of the existing systems.

## **1.2 A grassroots response**

To move beyond the modernist, quantitative understanding of waste that is associated with the neo-Malthusian dilemma presented above, attention must turn to the qualitative alternatives. As Caldeira and Holston (2005, p. 148) point out, “modernist planning is decidedly not democratic. Rather, it is based on imperial imposition of its brand of equality, a ‘planner knows best’ vision of an already scripted future”. Across Brazil, however, a grassroots response to the urban problématique has begun to re-script urban futures. Grassroots approaches stimulate a new visibility of local conditions within global processes; they are what Escobar (2001) refers to as subaltern strategies of localization. According to Biel (2000), these subaltern strategies have spawned “vestiges...not welcomed by capitalism: namely co-operatives, local economies and grassroots innovation” (Biel, 2000, pp. 290 – 291). While grassroots movements may grow from economic motives, their struggle is not conceived in purely economic terms (Escobar, 1992), and they can forge alternative forms of social and political organisation (Biel, 2000; Perreault, 2003).

This thesis focuses on two such vestiges: the development of a network of informal recyclers and recycling co-operatives; and, the proliferation of urban agriculture on underused urban land. The former is forcing a more qualitative understanding of waste and waste management, as informal recyclers – known as *catadores* in Brazil – have

begun to appropriate the surpluses that the formal capitalist system cannot absorb. In so doing, they are re-circulating the use values embodied in discarded commodities that the capitalist system would otherwise devalue or physically destroy (Harvey, 2006). Similarly, community gardeners across urban Brazil are appropriating spaces that have been devalued by the formal capitalist system. For the urban gardener, unused land is a relational space where “political action crystallizes and social mobilization takes place” (Swyngedouw & Heynen, 2003, p. 902). As Mitchell has put it, “by claiming space in public, by creating public spaces, social groups themselves become public” (2003, p. 129). Thus, community-based urban agriculture (or community gardening) on vacant public land can forge new opportunities for the re-localisation of food supplies, the re-circulation of values inherent in urban space, and the re-assertion of public over private ownership.<sup>3</sup> The integration of organic waste management with urban agriculture helps to realise these opportunities, as nutrients, land, and labour, are all re-circulated for a more sustainable and equitable form of development at the community scale.

However, informal recyclers and community gardeners are not empowered simply by virtue of their opposition to the unequal capitalist system. The very fact that they appropriate surpluses that dominant capitalist society seeks to devalue indicates that they remain bound by the structures that they oppose. Urban systems are characterised by “allocative control” over the material world, and “authoritative control” over the social world (Soja, 1989). Some authors have presented recyclers and community gardeners as

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<sup>3</sup> Community gardens are defined by being under the management of local residents, rather than local government. While the gardens may be located on public (municipal) land and while the local government provides assistance (whether at start-up or later through capacity building), the gardens are open to public involvement, and groups of gardeners manage both the land and food distribution.

entrepreneurial in their attempts to subvert such control and gain a foothold in a new resource-based informal economy of the city (Medina, 2005; Mougeot, 2005b; Ojeda-Benitez, Armijo-de-Vega, & Ramírez-Barreto, 2002). However, according to Karnani (2009, p. 81), “the vast majority of the poor lack the skills, vision, creativity and drive of an entrepreneur”. While some individuals may have been able to build a successful business model based on recycling or urban agriculture (Ali, 2004; Karnani, 2009), the majority remains bound by the structural and institutional sources of their original oppression (Miraftab, 2004a). This reflects Marx’s realisation that “men [*sic*] make history, but not in the circumstances of their own choosing” (Soja, 1989, p. 141). Thus, the urban poor remain at the margins of urban life and reliant on marginal resources – resources that are on the cusp of being devalued by the capitalist system. Such vulnerability has been exacerbated by the neo-liberal turn of the state, as regulatory frameworks have made way for privatisation and strategies of self-help.

### **1.3 An ambivalence of the state**

According to Weinberg et al. (2000), the politics of waste management has been characterised by an ambivalence of the state. The state has come to rely on accelerating the treadmill of production to solve ecological problems through market mechanisms and alliances with private capital. Three different state approaches have emerged: 1) economic synthesis, whereby the state fosters capital accumulation and supports the exchange values of ecological components; 2) managed scarcity synthesis, whereby the state attempts some minimal regulation of ecosystems by balancing market values and the use values of various interest groups; and 3) ecological synthesis, whereby the state

prioritises ecological systems protection through the emphasis of use values over exchange values (Weinberg, et al., 2000). The majority of states remain locked into the economic synthesis model, which ignores distributive justice and is unsustainable, since ecosystem elements have a limited capacity to meet the competing demands of a political economy based on an accelerating treadmill (ibid.). Moreover, the reliance on partnerships with the private sector means that social and equity issues are not on the agenda for the provision of environmental services. While some regulatory practices have started to move towards the managed scarcity syntheses, these approaches can only reduce and not eliminate socio-environmental tensions (ibid.). While attempts have been made by governments to understand the local environmental, economic, and social impacts of waste and waste management, effective and robust policies have been largely non-existent (Petts, 2005).

Political frameworks that exist in support of urban agriculture are equally as fragile. As Cissé et al. point out, “overall, urban agriculture is marginalized in the statutory and legal codes...This marginalization translates into a lack of visibility, and sometimes into a total neglect of this activity, despite its proven contribution to the development of cities” (2005, p. 150). There are, however, three models of policy design identified by Mubvami and Mushamba (2006) that are capable of developing a more facilitative political framework for UA. First, the collaborative or communicative model offers a process of consensus-building to develop a vision for the city, and as such maintains the role of the planner. Second, the “just city perspective” is characterised by a more radical form of participation and goes beyond stakeholder consultation. The approach emphasises co-governance with civil society, and draws attention to unequal

power relations in decision-making processes. Third, what Mubvami and Mushamba (2006, p. 58) refer to as the “new life model” recognises the potential for UA to build new and alternative institutions, which also address issues such as urban poverty, food security, and employment. Few institutional settings have moved beyond the communicative model, and UA remains controlled by top-down planning initiatives.

In Brazil, the political framework for waste management and urban food security stands at a crossroads, as the country’s leaders attempt to steer it in opposite directions. On the one hand, policy rhetoric points towards social policies that recognise the role of decentralised waste management and urban agriculture in resolving the urban conundrum. On the other hand, policy implementation is characterised by neoliberal reliance on large-scale agro-industry and privatised services. Thus, while the PT (*Partido dos Trabalhadores* – Workers’ Party) symbolically recognises the national movement of informal recyclers, the country’s waste management paradigm remains locked into modernist, technological approaches to destroying surpluses. Meanwhile, social policies such as *Fome Zero* (Zero Hunger) suffer from implementation problems and have failed to meet their targets (Haddad, 2008; Hall, 2006).<sup>4</sup> Urban agriculture, therefore, lacks the impetus for effective, long-term implementation. Thus, despite the president’s 2007 proclamation (in reaction to the improved position of Brazil on the Human Development Index) that “we [Brazilians] are blessed by God” (Giraldi, 2007), the urban poor continue to go hungry as the excesses of Brazil’s drive for economic growth pile around them.

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<sup>4</sup> *Fome Zero* is a federal programme to ensure the human right to adequate food for people with difficulty of access. The programme “presupposes that everyone must have daily access to enough quantity of quality food to attend to the basic nutritional needs and maintain health” (Ministério do Desenvolvimento Social e Combate à Fome, undated-b, p. 3).

#### **1.4 A pilot study of integrated organic waste management in Diadema**

In 2008, a pilot study of integrated organic waste management was carried out in Diadema to explore the social and political feasibility of the concept in relation to the grassroots phenomena and state policies outlined above. Integrated organic waste management is defined by the integration of: a) alternative options for one type of waste; b) different tools or mechanisms, such as informative, economic, regulatory, and voluntary; and, c) different agents, such as government and non-government bodies (Seadon, 2006). The integration of different types of waste is not addressed here. For the purposes of this study, organic waste refers to biodegradable food waste, thus drawing on ecological definitions of organic as matter based on carbon and nitrogen bonds, rather than social definitions of organic as a classification for naturally produced food. Thus, integrated organic waste management is defined here as a decentralised model of collecting household food waste and locally processing it for use as fertilizer on urban agricultural plots. An integrated system of this kind stimulates an urban metabolism of nature that redistributes resources, nutrients, and ultimately value to the resource poor.

This thesis presents an investigation into the socio-economic and political feasibility of an integrated organic waste management model in Diadema. From the outset, therefore, the pilot study was grounded in a theoretical and practical commitment to participatory community-driven development (CDD), which addresses socio-economic and environmental inequality.<sup>5</sup> Participatory CDD approaches substantiate empowerment

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<sup>5</sup> CDD places decision-making and development process in the hands of the community, and emphasizes notions such as the co-management of resources, institutional transformation for more enabling environments, and the recognition and utilization of local knowledge and practices. As the first president of the Inter American Foundation described it, CDD has helped people to define their own problems, initiate

through real and lived experiences and an increased ability to act upon counter-hegemonic conceptions and decisions. Based on notions of inclusion and transparency, which affirm local knowledge (Parker, 2006), participatory approaches to CDD foster a transformative politics that grows from and remains anchored in the grassroots (Escobar, 1992). This process allows community-driven integrated organic waste management to redefine waste management and food security policies in Diadema. Attention focuses on “the political processes through which particular socio-environmental urban conditions are made and remade” (Heynan, Kaika, & Swyngedouw, 2006, p. 2). The participatory research process asks questions about “who produced what kind of socio-ecological configurations for whom” (ibid.)? A central task of the study was to “tease out who (or what) gains from and who pays for, who benefits from and who suffers (and in what ways) from particular processes of metabolic circulatory change” (Heynan, et al., 2006, p. 12). This brings us, in Braun's words, “face-to-face not with the essence of things, but with questions of power, ethics and politics” (2006, p. 206). That is, who and what processes define and mediate the viability, sustainability, and equitability of integrated organic waste management?

The pilot study, therefore, was not primarily an investigation into the practical feasibility of re-using food waste as compost. Rather, focus was upon the following.

- The quantity of good quality organic waste that is available – in terms of waste as surplus, how much surplus can be appropriated by the recyclers?

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their own solutions, and enlist their own resources (Bray, 2009). Such approaches “normally involve small-scale, practical efforts to achieve change, and are carried out by organizations such as village or neighbourhood associations, production or service cooperatives, cultural groups, workers’ associations, ethnic coalitions, or federations of such organizations” (Kleymeyer, in Bray, 2009, p. 3).

This question addresses the engagement and participation of local residents in separating organic waste for door-to-door collection.

- The socio-economic capacity among recyclers (transportation infrastructure; human capital) and community gardeners (demand; composting space and technology) to absorb the supply of household organic waste.
- The socio-economic and environmental implications of integrated organic waste management. In times of economic crisis surpluses are destroyed, meaning that the quantity of available non-biodegradable recyclable material is currently decreasing. Does organic waste have the potential to be a viable resource for livelihood diversification?
- The political framework that exists in support of integrated organic waste management as a community-driven waste management and food production strategy.

#### ***1.4.1 Research objectives***

In addressing the above issues, this thesis helps to resolve the lack of a conceptual and empirical synthesis between waste management and urban agriculture. The integration of organic waste management with urban agriculture is often presented as *ad hoc*, and experiences from Cuba remain an empirical exception (Cofie, Adam-Bradford, & Drechsel, 2006). Conceptually, Cofie et al. (2006) present the most advanced framework for a nutrient recycling loop, yet they fail to fully address the links with urban agriculture or fully address the ways in which integrated organic waste management is determined by the political and institutional framework. Cofie et al. tested their

framework for a nutrient recycling loop in countries such as Ghana, but focus remained on technical and logistical questions of composting procedure. Their investigation into the institutional settings was limited to the organisational capabilities of local institutions, and failed to adequately address questions of power in decision-making processes. This thesis moves beyond Cofie et al.'s framework, as tangible links with UA are discussed and a framework for integrated organic waste management is presented as contingent upon the political context within which it operates.

The pilot study was also inherently action oriented, as it sought to affect the links between waste management and urban agriculture. It was a stated mandate to bring together stakeholders and affirm the potential of integrated organic waste management in the community and local government. The aim was to actualise abstract notions of integrated waste management into material practice (Drummond & Themessl-Huber, 2007) – to create what Lejano and Wessells (2006) call a collective metanarrative amongst community stakeholders and local government that can be transformed into sustainable socio-environmental actions. To achieve this objective, an investigation into the political discourse that underpins local policy formulation and implementation is also required. Thus, a further objective was to explore the local articulation of national policy rhetoric and stimulate public participation in policy-making. This thesis presents a case for the future direction of policy-formulation in Diadema, if integrated organic waste management is to become a sustainable form of community development.

## **1.5 Thesis structure**

The thesis consists of two manuscripts, drafted for submission to academic journals pertaining to the fields of geography, development studies, waste management, and Latin American regional studies. Chapter Two presents the case study of integrated organic waste management in Diadema, and addresses issues such as the generation and production of household organic waste, the capacity amongst recyclers and community gardeners to absorb the supply of household organic waste, the demand for waste-derived compost as an end-product, and the implications of the integrated organic waste management system. Chapter Three places the case study into the policy context of Diadema, and explores the policy options for establishing a supportive political framework for integrated organic waste management. Concluding remarks are made in Chapter Four, making reference to the value of the study and suggestions for future research.

## **2 A Framework for Integrated Organic Waste Management in Urban Areas: The Case of Diadema, Brazil**

### **2.1 Abstract**

The use of organic waste as fertilizer for urban agriculture is often presented as disorganised and fragmentary, as an *ad hoc* phenomenon. Such perceptions overlook the value of organised urban agriculture in contributing to sustainable increases in food production, and fail to recognise its contribution to a model of participatory integrated waste management. The recovery of organic materials through door-to-door collection re-circulates the value inherent in household organic waste and redirects it into urban agriculture. This process bridges formal and informal local institutions. Such a model moves beyond the persistent focus on linear models of urban waste management, which fail to take into account necessary qualitative dimensions of waste. In this article, a framework for participatory integrated waste management is presented, based on the findings of an empirical study carried out in the Brazilian city of Diadema, in 2008. The study explores the feasibility of conducting organic waste collection at the household level, in terms of the socio-economic capacity and political support to sustain the system. The results reveal that organised informal recyclers and community gardeners possess the capacity to collect and process organic waste, and civil society is sufficiently mobilised to ensure a reliable supply of good quality food waste. The quantity and quality of the resulting fertiliser helps to increase food production on urban agricultural plots, thereby enhancing community food security through direct production for self-provision, reciprocal distribution networks, and increased income generation by directing excess to

the market. Barriers include access to secure land, varying perceptions of coping with organic waste, technical problems of in-home storage and transportation, and insecure political and institutional support.

## 2.2 Introduction

Existing frameworks for the recovery and re-use of household organic waste in urban areas remain conceptually and empirically limited. First, there remains a focus on linear processes of urban waste management that face a form of modernist Malthusian dilemma of unchecked population growth and continuing urbanisation. This linear focus (which drives current state approaches to waste management) is misplaced, as it fails to take into account the qualitative dimensions of waste management and instead emphasises the tradability of ecosystem components on a capitalist treadmill of production (Weinberg, et al., 2000). In this context, waste management becomes an issue of accelerating the treadmill through the development of new technologies for effective waste *disposal*. While the fact that landfills are filling-up *is* a problem, there is a need to overcome this restrictive paradigm, and as Weinberg et al. point out, “the evaluation process will have to be more inclusive than simply ‘tons of wastes diverted from landfills’ ” (2000, p. 183).

In response, emphasis has recently turned to socio-ecological models that redefine waste as a resource within production cycles. Redefining waste as a resource moves beyond waste as an excess product of quantitative labour to conceive it in the sense of its material and abstract use-value. The material use-value of waste is maintained: it remains a “useful article” (Marx, 1976, p. 129) in the sense that it has a social purpose; it is no

longer “something that is discarded by someone, *implicating uselessness*” (Drackner, 2005, p. 176, emphasis added). The abstract value of waste is also recognised and re-vitalised; the labour that determines the commodity is no longer wasted (Mandel, 1976). As Marx (1976, p. 131) put it, “[i]f the thing is useless, so is the labour contained in it; the labour does not count as labour, and therefore creates no value”. Since human labour creates value by transforming nature into use-values and exchange values (which Smith (1984) referred to as the production of nature), the devaluation of labour that occurs in waste also serves to devalue nature. This is at the root of the unsustainable character of the treadmill of production.

Empirical studies of how to transform the re-conceptualisation of waste into practice have emerged from many different national settings, and primarily focus on the collection and re-use of non-biodegradable recyclables at the local level (see, for example, Gutberlet, 2008b; Johnson & Wilson, 2000; Medina, 2005; Ojeda-Benitez, et al., 2002 for case studies from Brazil, Mexico, Zambia, and Zimbabwe). In Brazil, attention has turned to the expanding network of *catadores de lixo* – waste pickers who carry out informal collection. Empirical studies of organic waste management have also emphasised a community-driven approach, often framed in terms of decentralisation. Decentralised schemes divert the major fraction of household waste away from the municipal waste stream towards a productive end-use at a local scale (Drescher & Zurbrügg, 2006). The end-use of food waste determines its value, and in this context many have emphasised the importance of marketing the final product (Drescher & Zurbrügg, 2006; Frömelt, 2007; Zurbrügg, 2003; Zurbrügg, Drescher, Patel, & Sharatchandra, 2002; Zurbrügg, Drescher, Rytz, Sinha, & Enayetullah, 2005). These

approaches, however, are concerned purely with the economic viability and survival of decentralised composting plants; they do not address the qualitative impacts of circulating environmental amenities, resources, and abstract labour. Few approaches develop an understanding of the complex impact that food waste-derived resources have on livelihoods and the urban environment. It is within this context that perspectives from urban agriculture are valuable.

This leads to a second limitation: within the literature on urban agriculture, the use of organic waste as fertilizer is presented as disorganised and fragmentary, as an *ad hoc* procedure carried out by marginalised urban citizens who practice urban agriculture as a last-gasp survival strategy. Urban agriculture is conceived as an extension of the treadmill of production, and rarely is it conceptualised in terms of a more sustainable circulation of resources at the local level. Indeed, the productive process of organic biodegradation has become increasingly divorced from agriculture; as agro-industry has grown, biodegradation has been increasingly adopted merely for the centralised treatment of waste (Müller, 2007).

There is a need to move beyond the perception of urban agriculture just as a safety-net to understand the fundamental ways in which it is embedded in and interacting with the urban ecosystem (Mougeot, 2001). This is often presented in terms of a process of closing the nutrient loop by applying food-waste-derived compost to depleted agricultural land, thereby enhancing production, farmers' livelihoods, and broader food security (Drescher & Zurbrügg, 2006; Mougeot, 2006, 2005b). Such outcomes have led Mougeot (2006) to conclude that the use of organic waste as a resource for agriculture represents a "triple-win"; it helps to clean-up the environment, reduces threats to health,

and increases agricultural production through the replacement of soil nutrients – not to mention the fact that it also reduces the economic and environmental costs of waste management. There is, therefore, an inherently positive reciprocal relationship between decentralised composting and urban agricultural production (Cofie, et al., 2006). Urban agriculture, then, can be redefined by its inter-relation with organic waste management; it becomes a viable and socio-environmentally sustainable means of circulating valuable resources and environmental amenities. In becoming more integrated with the urban ecosystem through the circulation of organic resources, urban agriculture enhances ecological and physical sustainability (Stoker & Barnett, 1998), thus providing an avenue for transforming abstract ideas about sustainability into material practice (Hess & Winner, 2007).

Empirically, however, this notion is not well-explored, and experiences in Cuba remain a marked exception (Cofie, et al., 2006). In Brazil, the purpose of urban agriculture extends beyond income generation and enhanced food security to include: the promotion of community spirit; the development of pedagogical tools; the maintenance of clean and utilised public lots; the preservation of local food habits and traditions; and, the provision of occupational therapy (Rocha, 2005). However, little empirical work has been carried out to explore the relationship of reciprocal determination between organic waste management and urban agriculture.

The work presented here addresses the above limitations by presenting a framework for integrated organic waste management based on empirical findings. Organic waste is defined here as food waste suitable for transformation into agricultural fertilizer. This builds on ecological definitions of organic as matter based on carbon and

nitrogen bonds, rather than on social definitions of organic as a categorisation of naturally produced food. The notion of integrated waste management, meanwhile, concomitantly addresses direct impacts (such as transportation, collection, treatment and disposal of waste) and indirect impacts (such as the use of waste materials and energy outside the waste management system) (Seadon, 2006). Focus here is upon three of the four categorisations of integrated waste management proposed by Seadon (2006): 1) focus on integration within one medium to consider alternative options; 2) the integration of different tools or mechanisms, such as information, economic, regulatory, and voluntary; and, 3) integration between different agents, such as between government and non-government bodies. Multi-media integration of biodegradable and non-biodegradable material is not addressed here. Thus, integrated organic waste management is defined as a process of re-circulating the value inherent in household organic waste through the integration of door-to-door informal collection with urban agriculture, a process that bridges institutions.

The notion of integrated organic waste management is explored via a case study in the Brazilian city of Diadema, where a pilot project of integrating decentralised organic waste collection with urban agriculture was carried out in 2008. A case study approach is adopted here not to present the singular experience of integrated organic waste management in Diadema, but to investigate the phenomenon within context (Castree, 2005). Thus, it is the local articulation of integrated organic waste management that is under investigation (*ibid.*), and a case-study approach is well-suited to describe and conceptualise the notion. Prior to delving into the case study, section 2.3 explores the socio-demographic, policy, and project background to the pilot study. The major findings

are discussed in section 2.4, before the concluding remarks in section 2.5 establish a framework for integrated organic waste management and future directions for research.

### 2.3 Background: A pilot study of integrated organic waste management in Diadema, Brazil

Diadema is an exclusively urban peripheral municipality within the metropolitan region of São Paulo (Figure 2-1). The city had a population of 386,779 in 2007 (IBGE, 2008), and a population density of 12,620 per km<sup>2</sup>, making it the third densest municipality in Brazil (Prefeitura do Município de Diadema, 2007). Diadema has also experienced an increase in the quantity of slums from 31 in 1977 to 207 in 2004, meaning that more than a quarter of the city's population now lives in slum conditions (derived from: Secretariat of Housing, 2008).



Figure 2-1 Map of the São Paulo region (cartography: Ole Heggen)

### ***2.3.1 Waste management***

The São Paulo region remains locked into the linear model of waste management; consequently, the region's marginal urban areas are characterised by a disproportionate accumulation of waste. In 2004, only 237 of the 5,507 municipalities in Brazil practiced selective waste collection (Mancini, et al., 2007). According to the Instituto Brasileiro de Geografia e Estatística – Brazilian Institute of Geography and Statistics (IBGE, 2002), in 2000 92.43% of the waste collected in São Paulo was directed to controlled or uncontrolled landfills. The majority of collected waste is dumped unproductively into a rapidly decreasing available space, thereby producing a myriad of environmental and health hazards (Gutberlet, 2008b; Kong, 2008; Meyers, et al., 2008; Sharma, et al., 2008).

Moreover, municipal waste in the São Paulo region consists of approximately 57.5% biodegradable food waste (FW) (IBGE, 2002). Due to the biodegradable nature of food waste, sending it to landfill enhances potential hazards such as slope failure through static liquification (Blight, 2008, p. 457), and leads to increased greenhouse emissions and the leaching of toxins to soils (Adhikari, et al., 2006; Kong, 2008; Mancini, et al., 2007; Meyers, et al., 2008). In Brazil, these hazards are exacerbated by a lack of landfill liners, leachate and gas collection systems, caps, or monitoring devices (Sharma, et al., 2008). Attempts to divert waste from landfill also remain locked into the linear model, as experiments focus on biotechnological processes of disintegrating or completely destroying organic waste (Papadimitriou, Barton, & Stentiford, 2008; Stabnikova, Ding, Tay, & Wang, 2005). This techno-focus is pronounced in Brazil, as revealed by Münnich, Mahler, & Fricke's (2005) pilot project of the mechanical-biological treatment of organic waste in Rio de Janeiro.

Despite – or perhaps as a result of (Ackerman & Mirza, 2001) – inequality in Diadema, a form of community-based counter-politics has emerged from the grassroots in an attempt to redress the waste situation in the city. According to Biel (2000), such a counter-politics is based on survival strategies that have produced “a massive informal economy, where people resort to unofficial activities and schemes for self-sufficiency”. This has, in turn, spawned “vestiges...not welcomed by capitalism: namely co-operatives, local economies and grassroots innovation” (Biel, 2000, pp. 290 – 291). These vestiges have emerged in the waste sector, and in recent years, there has been increasing commitment and progressive government support for decentralised resource recovery in Diadema. As Gutberlet (2008b, p. 136) explains, Diadema is “the first city in Brazil where organised, independent recycling groups are officially in charge of collecting, selecting and commercialising recyclables”.

Since 2002, the municipal government of Diadema has been working with the city’s *catadores* in the implementation of the Participatory Sustainable Waste Management (PSWM) project – a collaborative project working towards more inclusive models of urban waste management in São Paulo (Figure 2-1) (Takahashi, 2007). In 2004, strides were made towards incorporating informal recyclers into a model of resource recovery and re-use, as the municipality established the city-wide recycling programme *Vida Limpa* (the Clean Life programme) (Gutberlet, 2008b). *Postos de entrega* (collection depots) were established across the city according to planned catchment areas (*micro bacias*) (Takahashi, 2007), and in 2008 there were six fully-functional *postos*, with plans in place to establish a further eight. *Posto do Centro*, which provided the infrastructure and capacity for this pilot study, was established in June 2007,

and joined the other five *postos* under the umbrella association of *Pacto Ambiental* (Environmental Pact).

In June 2004, Diadema became the first municipality in the country to support recyclers' associations with an official policy of remuneration. As of 2008, the *catadores* received R\$38 (US\$16) per ton of material that is diverted from landfill. This remuneration policy was entrenched in 2005, as regular pay for the *catadores* was guaranteed by the municipal signing of a partnership memorandum with *Pacto Ambiental* (Gutberlet, 2008a). Remuneration contributes to the average income of R\$380 (c.US\$165) per month amongst *Vida Limpa catadores* (Gutberlet, 2008b). However, recyclers in Diadema remain physically and socio-economically vulnerable, and are left dependant on unstable economic markets. At the local level, they are trapped within a monopsonistic market that is controlled by intermediaries (*ibid.*), and characterised by a race to the bottom (Miraftab, 2004b).

### **2.3.2 Food (in)security**

In addition to carrying the burden of waste, peripheral urban areas of Brazil also suffer from food insecurity; the low-income households in these regions spend 50 – 80 per cent of their disposable income on food and still do not meet their daily dietary requirements (Egal, Valstar, & Meershoek, 2001; Mougeot, 2005b). Compounding this situation is the centralised food system in Brazil, which is characterised by large-scale agribusiness and an under-developed domestic fresh fruit and vegetable market (Rocha, 2003). This makes access to fresh food both difficult and costly, and only 44% of Brazilians consume fresh fruit (*ibid.*). Although Asfaw (2008) concluded that in Latin

America there is a positive and significant relationship between urbanisation and the availability of fruit and vegetables, this conclusion does not account for spatial inequality within urban areas. According to IBGE, in 2003 the incidence of poverty in Diadema was 43.8%, and the Gini coefficient was 0.37, indicating a considerable degree of inequality in wealth. Moreover, Diadema is an industrial, urban municipality with a dearth of food production. Value added to gross domestic product in Diadema by agriculture is only 348.000,00 Reais (R\$) (circa US\$149,000.00 ) per annum, compared to the R\$3.5 billion (c. US\$1.5 billion) generated by the tertiary sector and R\$3 billion (c. US\$1.2 billion) generated by industry (IBGE, 2003). In this context, financial wealth determines food security. Thus, despite the prominence of agriculture in Brazil, urban dwellers in Diadema still go hungry (Oths, et al., 2003). The population of urban poor in Diadema, therefore, is locked into what Davis calls “an existential condition that can only be described as ‘marginality within marginality’...a grim human world largely cut off from the subsistence solidarities of the countryside as well as disconnected from the cultural... life of the traditional city” (2006, p. 201).

The municipal government of Diadema is, however, proactive in its policies aimed at enhancing food security and nutrition. In 2003, Diadema established *CONSEAD* (the Diadema Council on Food Security) to encourage the federal government to implement actions towards the national *Fome Zero* (Zero Hunger) agenda. Diadema is among the municipalities most responsive to the federal government’s social agenda, establishing *bancos de alimentos* (food banks), a *restaurante popular* (people’s restaurant), and a land and citizenship project to help resurrect a culture of agriculture and transform idle urban space into productive agricultural land. As a result, a network of

*hortas comunitarias* (community gardens) has emerged in the city, supported by the department of *Abastecimento Público* (public provisions). The achievements of Diadema's social and food security programmes have been featured within federal publicity material (Ministério do Desenvolvimento Social e Combate à Fome, 2008).

### ***2.3.3 The pilot study***

The case study presented here draws on the results of a pilot study of integrated organic waste management in Diadema. The pilot study was grounded in a methodological philosophy of substantive participation for community-driven development (CDD). This approach substantiates empowerment through real and lived experiences and an increased ability to act upon counter-hegemonic conceptions and decisions. Based on notions of inclusion and transparency, which philosophically affirm local knowledge within a politics of community-formation (Parker, 2006), participatory approaches to CDD foster a transformative politics that grows from and remains anchored in the grassroots (Escobar, 1992). Such a transformative politics is capable of creating sustainable communities from the bottom-up, though this process is not given or uncontested (Classen, et al., 2008; Dasgupta & Beard, 2007; Gutberlet, 2008b; Weinberg, et al., 2000). This approach recognises the community as a site of both solidarity and conflict, of “shifting alliances, power and social structures” (Clever, 2000, p. 45), and as a contested terrain that gives rise to a “spatialized politics” (Perreault, 2003, p. 98). Thus, it is contestation and struggle at the local level that lends legitimacy to a grassroots politics, for it opens up the processes of development to those who are marginalised by top-down initiatives.

The pilot study, then, was based on a recursive participatory design, in which *catadores*, community gardeners, local residents, and key municipal informants played vital roles. The overall research framework emphasised a form of active participation within the day-to-day aspects of the study, rather than opportunistic and passive participation. The practical logistics of the pilot and research processes were established in collaboration with the *catadores*, community gardeners, and municipal representatives in the departments of *Habitação* (Housing), *Limpeza Urbana* (Urban Clean-up), and *Abastecimento Público* (Public Provisions). The pilot neighbourhood (Appendix 1) was identified as part of an existing *Vida Limpa* catchment area, and as a result of its propinquity to the *Vida Limpa* collection depot (*posto do Centro*) and the community garden at *Fundação Centro de Atendimento Socioeducativo ao Adolescente (CASA)*. *Fundação CASA* is a municipally managed “re-socialisation centre” for youth who have committed a minor criminal offence. The decision to work with the community garden at *Fundação CASA* was supported by site visits to the other community gardens proposed by the municipality for the pilot study. The visits revealed constraints such as a lack of physical access and social conflict over land-use (see box 2.1). The space at *Fundação CASA* though was not without constraints, as the community garden is located within the locked gates of the institution, meaning that security clearance had to be obtained prior to entry.

**Box 2-1 Socio-spatial dynamics of community gardens investigated in Diadema****Site 1: *Fundação CASA***

This is a small garden tended by two volunteers, who work separately as street cleaners for the municipality. Fundação CASA presented the notion of the garden for educational purposes, and the gardeners subsequently claimed ownership and have been fundamental to its long-term survival. There was plenty of topographically accessible space available for composting, and the propinquity of the garden to an established *Vida Limpa* collection route was an asset. However, as part of *Fundação CASA*, the entire site is within locked, meaning that access is determined by security clearance. The products from the garden currently feed to the youth in the centre, while the farmers distribute the remainder according to their needs.

**Site 2: *Jardim Santa Elizabeth***

The municipality cleared the contaminated land, and offered local residents the option of utilising the space for UA. The site consists of a large, flat space, with plenty of room for composting, which is already taking place and is easily accessible. However, the soil is poor (having been recently decontaminated by the municipality) and there is a lack of interest from the community, meaning that the space has so far been poorly utilized. Two organised groups currently tend the land, but the output is low. There is contestation with the local residents, who have resorted to violent tactics to drive away community gardeners in favour of an expansion of their informal settlement. The local residential area also posed an environmental problem, as contaminated run-off and household waste may contaminate crops despite the municipality having installed a water diversion system to alleviate this problem. Household waste is challenged underground through drain

pipes, but many pipes appeared damaged; it is likely that household waste is not confined to the system.

**Site 3: *Jardim Inamar***

*Jardim Inamar* is a large garden behind a school, located on a steep site with little room for compost. Local residents established the garden on under-utilised space, and the municipality later took interest and began to lend support through capacity-building initiatives. The garden is advanced, with 3 different organised farming groups tending the land and collectively selling produce. However, they do not distribute through any other organisations (e.g. the Diadema food bank) and have not been encouraged to do so by the municipality (e.g. price incentives to sell to food bank). While the garden is socio-political easily accessible, the topography presented a barrier to organic waste transportation and processing. Moreover, the garden is not close to an established *Vida Limpa* collection route.

**Site 4: *Posto Novo Conquista***

Within *Posto Nova Conquista* there is a small plot, though there is no space for expansion or composting. The produce is of good quality but low in quantity. *Posto Nova Conquista* also has problems with the local community, who do not separate their waste efficiently. The *Posto* does not currently collect organic waste, yet often receives organic waste along with non-biodegradable material. While this points toward a need for organic waste collection, further environmental education of the local community is required to ensure that waste is separated effectively.

The results presented below draw on the data collected during the pilot study, including food waste collection data, participant observation notes, household survey responses, evaluation survey responses, and qualitative interviews. The household surveys included both closed- and open-ended questions, and were distributed to investigate the behaviours, perceptions, and values among the residents (see appendix 2). The survey responses were added to a database, and the qualitative responses thematically coded prior to analysis. Information on participation in the surveys and the characteristics of the participating households is presented in Table 2-1, which reveals the relatively uncharacteristic nature of the pilot study neighbourhood in comparison to other areas of Diadema. Diadema is characterised by high numbers of residents per household, including a high number of children. The pilot neighbourhood, however, possessed a low proportion of children, which is a reflection of the age demographic of the neighbourhood and the fact that it is adjacent to the municipal offices, making it slightly more well off than many areas of Diadema.

**Table 2-1 Survey participation and household dynamics**

Characteristic	Result
Number of households in neighbourhood	86
Number of completed household surveys	45 (52.3% of total households)
Number of evaluation surveys completed	13 (41.9% of households that participated in the pilot)
Number of households willing to separate organic waste for the pilot study	41 (91.1% of surveyed households)
Total number of residents among surveyed households	172 (147 adults; 25 children)
Average number of residents per household	3.82 (3.27 adults; 0.56 children)

The household surveys helped to inform the design of the pilot collection, which was carried out over a period of three weeks. Household participation in the pilot is presented in Table 2-2. Two of the *catadores* from *posto do Centro* collected food waste from the forty-one households on a twice-weekly basis, a schedule based on responses in the survey and the guidance of *Vida Limpa*. The *catadores* transported the food waste directly to *Fundação CASA*, where the gardeners received the waste and carried out processing, providing technical expertise as well as the supplementary materials required for aerobic decomposition. Given the availability of space and labour for composting at *Fundação CASA* and the scope of the pilot study, and following Rothenberger et al's (2006, p. 49) decentralised composting manual, the decision was made to establish a windrow, or trench, system of composting.

**Table 2-2 Household participation in the pilot project**

Collection Round	Number of contributing households	Participation as a proportion of households that agreed to participate (%)
1	13	31.7
2	18	43.9
3	20	48.8
4	25	61.0
5	23	56.1
6	22	53.7
<b>Total number of different households that participated at any one point</b>	<b>31</b>	<b>75.6</b>

Throughout the pilot study, field notes were kept based on participant observation, as the researcher “set out to become involved in, or influence, the setting under investigation by striking up relationships with people in the setting” (Moug, 2007, p. 109). This results in what Labaree (2002) calls “insiderness”, the benefits of which

include exposing hidden truths, accessing privileged information that would be otherwise unobtainable, breaking down “self-protective behaviours” of the “subject” group, enhancing access to target groups and critical information, improving understanding of how groups internalise information, and being able to interpret the culture of the group. Such positioning, however, brings with it a host of dilemmas relating to what Labaree (2002) calls the “insider-outsider debate”. The question here is whether interpretive outcomes and conclusions would differ significantly as a result of direct researcher participation, and whether unequal power relations between the researched and the researcher is the key driver of this potential difference. Thus, while participant observation prioritises the expression of emic realities over the imposition of etic frames (Chambers, 2007), the researcher must remain mindful of the potential to alter both the expression and the reality itself. As a research tool, therefore, techniques of observation are not simple and uncontested. As Reger points out, for the participant observer there is a degree of intensity and emotional involvement in “locating ourselves in meaning-laden spaces” (2001, p. 605). This does not imply that an insider’s view is somehow instilled in the outsider, but rather emphasises that the process of engaging with research subjects may influence interpretation. However, once the researcher had been perceived as a participant and became familiar to stakeholders in the research process, it was not possible to revert to non-participant techniques.

The above methods were complemented by in-depth, semi-structured interviews, which were carried out with six municipal representatives, three *catadores*, and two community gardeners. The interviews were designed to develop a deep understanding of the complex issues that surround the human subjects (Baxter & Eyles, 1999). The

interviews were transcribed, translated, and coded in NVivo<sup>®</sup>, thus facilitating content and discourse analysis. Interview methodologies, however, do have their drawbacks, as the perspectives and experiences of individuals are not always accurate representations of actions or facts (Knox-Hayes, 2008). Rigour and credibility, therefore, were enhanced through the triangulation of results across all interviews.

## **2.4 Principal findings**

The feasibility of integrated organic waste management is not confined to practical or biological processes of composting and food production, but rather hinges on the social, political, and economic settings in which it is applied. The question at hand is not simply whether the system *can* work practically and biologically (we already know the answer to this, as composting for agriculture has been practiced for centuries (Ojeda-Benitez, et al., 2002)), but concerns the extent to which local conditions *allow for* and *can sustain* an integrated system of food waste recycling. The discussion below, therefore, draws on the experience and results of the pilot study, and makes links between composting and social, economic, political, and environmental factors. For the purposes of discussion, analytical distinctions have been made between supply-side aspects, the socio-economic capacity to sustain the system, demand-side and viability issues, and the socio-environmental implications.

### ***2.4.1 Supply-side aspects***

The factors that affect the maintenance of a supply of food waste and compost can be considered in terms of natural and built assets – the ecological components and the physical settings (Smit & Bailkey, 2006). Practically and logistically, the small-scale

pilot was successful, which indicates the potential for such a small-scale, decentralised model in urban neighbourhoods. However, of greater concern here is the availability of sufficient quantity and quality of food waste. The waste generation characteristics of the pilot neighbourhood are presented in Table 2-3. According to estimates from the survey, the organic fraction of household waste in the neighbourhood exceeds the São Paulo regional average of 57.5% by 16.92%. This may reflect the fact that 77.8% of respondents separate material for *Vida Limpa*, which implies that they view solid recyclable material as distinct from general household waste. The high proportion may also reflect the low-income status of households in Diadema, as the proportion of food waste per household has been found to decrease with increases in wealth (as wealthy households tend to consume more non-biodegradable commodities) (Barreira, Junior, Rodrigues, & Teno'rio, 2008).

However, evidence from the pilot collection indicated that the mean weight of food waste produced per household per week was 3.3 kg, compared to the survey estimate of 31.6 kg per week per household. Despite the apparently low quantity of carbon and nitrogen that is produced in the food-waste-derived compost (Table 2-3), the neighbourhood is capable of providing 282.5 kg of food waste per week for door-to-door collection. Evidence from the literature indicates that the density of three-month old compost is 96.05% that of the original food waste (Bhattacharyya, Chakraborty, Bhattacharyya, & Chakrabarti, 2003; Faucette, Das, & Risse, 2000; Parizeau, Maclaren, & Chanthy, 2006). Thus, the pilot section of this neighbourhood can produce 272.7 kg of compost each week, containing 81.3 kg of carbon and 6.2 kg of nitrogen (at a C:N ratio of 13.1:1), valuable nutrients that can be fixed into the soil for agricultural enhancement.

Indeed, a community gardener indicated that the quality of the food waste provided will likely yield positive results: “the organic waste is practically clean, there is no meat leftovers, no salt, no plastic... Practically, [it is] a clean thing that will provide healthy vegetables and a healthy vegetable garden”. Previously, Montemurro and Maiorana (2007) have proven that the application of food-waste-derived compost increases the total quantity of organic carbon in soils by up to 37%, while Olowolafe (2008) revealed that the application of waste-derived compost in Nigeria significantly improved agricultural soils in terms of structure, nitrogen and phosphorus content, pH, and exchangeable calcium and magnesium.<sup>6</sup>

**Table 2-3 Quantity and quality of mixed waste and food waste**

	Literature	Household Survey	Pilot Collection <sup>i</sup>
<b>Volume of mixed waste (litres/capita/week)</b>		28.20	-
<b>Volume of food waste (litres/capita/week)<sup>ii</sup></b>	16.2	21.00	1.98
<b>Food waste as a proportion of mixed waste (%)<sup>ii</sup></b>	57.54	74.46	-
<b>Quantity of food waste (kg/capita/week)<sup>ii</sup></b>	3.78	8.26	0.86
<b>Quantity of compost (kg/capita/week)<sup>iii</sup></b>	3.63	7.93	0.83
<b>Quality of food waste (nutrient content – kg/capita/week)<sup>iii</sup></b>	<b>Carbon</b>	1.99	4.35
	<b>Nitrogen</b>	3.63	0.47
<b>Quality of compost (nutrient content – kg/capita/week)<sup>iii</sup></b>	<b>Carbon</b>	1.99	2.46
	<b>Nitrogen</b>	0.21	0.16

<sup>i</sup> Calculations are derived from the total quantity of food waste received, which does not include the 550 litres, or 37.7 kg, of garden trimmings that were also provided. Although garden trimmings are beneficial for composting in general, and were indicated as acceptable for the pilot project, this study focused on household food waste.

<sup>ii</sup> Literature data sources: Fehr, deCastro, & Calçado (2000); IBGE (2002).

<sup>iii</sup> Calculated according to previous analyses of the composition of food waste and food-waste-derived compost (Bhattacharyya, et al., 2003; Castillo, Herrera, López-Bellido, López-Bellido, & Fernández, 2004; Faucette, et al., 2000; Francou, Poitrenaud, & Houot, 2005; Matteson & Sullivan, 2006; Means, Starbuck, Kremer, & Jett, 2005; Montemurro & Maiorana, 2007).

<sup>6</sup> A related research project was carried out by *Fundação Santo André* to investigate the quality of the compost that resulted from the pilot study. Such a study was beyond the scope of this analysis, given the temporal constraints.

Nonetheless, the quantity of food waste provided during the pilot collection was surprisingly low when compared to data in the literature from previous collection studies carried out in Brazil, and especially given the high proportion of food waste reported in the household surveys. Reasons for the low per capita quantities of food waste collected during the pilot include both practical and social constraints. In the evaluation survey, households reported difficulty with in-home storage methods; organic waste is more difficult to store than the non-biodegradable waste they separate for *Vida Limpa*, and without appropriate storage mechanism, the waste can attract insects and rodents. The residents also struggled with the collection frequency of just two rounds per week, meaning that food waste was also discarded through the usual municipal channels instead of being directed to the *catadores*. Indeed, residents reported storing and donating only a proportion of their organic waste because of the above two limitations. The remainder of the waste was either included with general waste or used privately; residents frequently mentioned their own uses for organic waste, such as feeding animals and plants. Some residents also refused to provide material because they did not want to associate with the *catadores*; these residents held a low opinion of the *catadores* due to their association with waste collection and their perceived lower socio-economic status. Similarly, although 77.8% of respondents already participate in *coleta seletiva*, many of the respondents that did not complete a survey revealed that they did not want to support the activities of *Vida Limpa* or associate with *catadores* due to the perceived social difference.

The small per capita quantities of nutrients also reflects the low density of the food waste collected, which was recorded at 0.43 kg per litre, in contrast to the average

density of 0.73 kg per litre recorded in the literature (Bhattacharyya, et al., 2003; Faucette, et al., 2000; Parizeau, et al., 2006). The low density may be due to insufficient environmental education activities carried out during the pilot, resulting in the inclusion of heavy, slow-degrading materials such as coconut shells and problematic cooked food waste. Outside storage of the food waste in non-airtight plastic bags may also have led to decreased moisture content, thereby reducing the density.

Ultimately, however, it is the engagement and mobilisation of the community that dictates the supply of food waste. Collective action literature indicates that minority groups seeking socio-political change must reach a “critical mass” of thirty per cent if their desired changes are to be carried out and sustained (Acharya, 2006). Evidence from the household surveys, which were carried out prior to the pilot collection rounds, indicated that this critical mass did exist within the pilot study neighbourhood. The results presented in Table 2-4 indicate an environmentally conscious and active community: 54.8% of respondents are aware of environmental issues, 81.4% perceive recycling and local food production to be important and/or beneficial, and 66.7% were willing to participate in local projects and/or change behaviours. The residents were, therefore, largely aware of the benefits of re-using household food waste; as one resident explained, “I would be contributing to everybody’s wellbeing; [a] clean life, [a] healthy life. It is better for everybody if we always try to make good use for our advantage and everything around us, with no waste”.

**Table 2-4 Residents' engagement with socio-environmental issues pertinent to the project**

Issue	Proportion of respondents (%) (n=45)
Aware of selective waste collection ( <i>coleta seletiva</i> )	95.6
Recycling food waste creates more benefits than problems	88.9
Perceive recycling waste as extremely important	88.4
Agreed to separate food waste for the pilot study	84.4
Able to identify material accepted by the <i>coleta seletiva</i> programme	80.0
Participate in <i>coleta seletiva</i>	77.8
Do not perceive difficulties in operating a system of collecting food waste	77.8
Indicated a theoretical willingness to separate food waste	73.3
Perceive local food production as extremely important	70.5
Agreed that knowing that their food waste helps to locally produce fresh food would cause a significant change in their food consumption habits	64.4
Agreed that knowing that their food waste is recycled would cause a significant change in their recycling habits	53.3
Able to identify the destination of municipally collected waste as landfill	46.7
Indicated a theoretical willingness to participate in a community garden	46.7
Aware that <i>Vida Limpa</i> is the organisation responsible for <i>coleta seletiva</i> in their neighbourhood	13.3
Aware of urban agriculture in the neighbourhood	6.7

The values and perceptions held by the residents, however, were not uniform or uncontested. While the majority identified food waste as a resource to be recovered, thus conceptualising waste as an asset, a significant proportion also perceived food waste to be an environmental hazard, a health risk, or a social contagion, and indicated that waste should simply be removed from the neighbourhood. Thus, many of the residents remain locked into a perception of waste management that is characterised by a tragedy of the commons, whereby a passive referral displaces the problem of waste management to someone else (Drackner, 2005). As a result, the ideals in Table 2-4 were not directly

transferred into what Acharya (2006) calls critical action. Participation in the pilot collection rounds (see Table 2, p30) was surprisingly low, given the theoretical commitment among residents to contribute to the pilot study. This supports Drackner's (2005, p. 177) assertion that "[t]he fact that people hold certain values or perceive the order of things in certain ways doesn't mean that they actually behave accordingly. Studies of the extent of pro-environmental values often expose a gap between ideas and behaviour."

Thus, the extent to which the potential of integrated organic waste management affirms change in material practice depends on the perceptions of the neighbourhood residents and the ways in which these perceptions are actualised into material practice (Drummond & Themessl-Huber, 2007). This indicates that further knowledge mobilisation and environmental education activities are required to mobilise passive neighbourhood perceptions into assertive critical action. The key stakeholders in the project recognised the importance of such activities; as a municipal representative remarked, "a fundamental aspect is when it comes to working with the population, working with these issues so that people can make the changes in the way they act". Subsequent pilot projects or permanent implementation of integrated organic waste management will be better placed to incorporate a widespread environmental education component, which will help transform environmental values into critical action. This can be combined with sustained collection, which will help to build habits over time, thereby helping to scale-up collection volumes to a level that is both useful to the gardeners and within their capacity to process.

#### ***2.4.2 Socio-economic capacity (opportunities and constraints)***

The socio-economic capacity to sustain a system of integrated organic waste management refers to the ways in which a community's social, cultural, and economic assets create "gateways" to viable livelihoods (Scoones, 1998, p. 12). For integrated organic waste management to be sustainable, capacity must exist within the community to combine their capital endowments (or assets) so as to acquire access to and control over the necessary resources (Scoones, 1998). The collectors (*catadores*) and processors (community gardeners) must be able to absorb the supply of household organic waste discussed above.

The success of *Vida Limpa* as a recycling co-operative in Diadema illustrates the organisation's capacity to carry out door-to-door collection of organic waste. *Vida Limpa* possesses significant knowledge and expertise in the recycling sector, and the pilot study revealed that this is transferable from the context of solid, non-biodegradable waste to that of organic, biodegradable waste. However, the focus of *Vida Limpa* does remain on non-biodegradable waste, as indicated by the reluctance among *Vida Limpa* decision-makers to increase the number of collection rounds for organic waste above two per week. The capacity to sustain organic waste collection, therefore, may hinge on the ability to manage the competing drains on time resources, and options such as combined collection should be explored. The capacity among the community gardeners to receive and process the material was equally strong, as they possessed the necessary knowledge and skills to transform the abstract notion of organic waste-as-a-resource into a material reality. These two groups were able to pool their resources to ensure that the process of integrated organic waste management was effective.

The collective capacity of the *catadores* and gardeners was mediated by access to the space at *Fundação CASA*. The issue of access, as mediated by social and political relations, fundamentally influenced the use and definition of the space at *Fundação CASA*. Rather than being openly defined by the collective community subject, the space at *Fundação CASA* is ordered and controlled by those who dominate social processes (Mitchell, 2003). The space, therefore, transforms from one of inclusion to one of exclusion. Interviews with the gardeners, employees at *Fundação CASA*, and municipal representatives revealed this tension within the space, between its motive to educate and open up possibilities of urban agriculture on the one hand, and its *modus operandi* as land within the confines of *Fundação CASA* on the other. Given the nature of the site, this was, to a degree, an anticipated outcome. However, for the purposes of the pilot study, the garden at *Fundação CASA* provided the best logistical opportunity.

#### ***2.4.3 Demand-side aspects: the viability of the end-product***

Perspectives on decentralised composting often emphasise the importance of identifying an end-use and a market for the compost. It is deemed necessary to identify appropriate target markets and develop good relationships, communicate the benefits of the product so as to stimulate demand, and establish a price/quantity ratio that ensures viability and profitability (Rouse, Rothenberger, & Zurbrügg, 2008).<sup>7</sup> The aim is to explore the demand for compost in order to evaluate the capacity for the market to absorb

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<sup>7</sup> A full market analysis of the demand for compost and of the appropriate price/quantity ratio for market exchange was beyond the scope of the pilot study. However, beyond the reciprocal network outlined here, financial capacity exists within the municipal government to support the supply of compost through a policy of remuneration (further explored in section 2.4.4).

the introduction of compost as a commodity. However, the marketability of compost should not be the only goal of integrated organic waste management. Placing food waste-derived compost into the market serves to commoditise ecosystem components, which *extends* the linear model of waste management rather than facilitates progress towards a cyclical model. In contrast, the integration of urban agriculture with organic waste management creates a natural market for compost and challenges the notion that decentralised composting must be aimed solely at the capitalist commodity-producing sector (Gibson-Graham, 2006).

In the context of the pilot study, the links with urban agriculture established the demand for compost, which illustrates that the community gardeners possessed sufficient demand capacity, as they were able to make productive use of the volumes of organic waste collected. The establishment of a network of community gardens in Diadema also points towards a growth in demand for compost and a broader system of exchange. A community gardener emphasised the possibility of an exchange network: “I’ve met people from other vegetable gardens and we could exchange amongst the gardens with no problem: plants, fertilizer, etc. When the fertilizer is ready, we could bring something for them: a little or a big bag. If we could bring it, better! In the same way they could help us, we could help them [too]”.

Although the reciprocal nature of the pilot project circumvented the need for monetary exchange, the gardeners indicated a willingness to reach an agreement with the *catadores* for the delivery of organic waste in the future. Currently, the products from the community garden are helping to feed the youth in the rehabilitation centre and local residents who visited the garden received food for their contribution to the pilot study.

Following Rouse et al. (2008), good relationships were established with the residents and their interest in receiving food for the organic waste donations increases the demand for food, thereby reinforcing the gardeners' need to increase production, potentially through the application of fertilizer. Plans are also in place to incorporate the local school within the collection round and subsequent food distribution, which will further support the reciprocal system. The community gardeners, who emphasised the communal and qualitative dimensions of the garden over personal economic opportunities, supported a reciprocal model of this kind. As one of the participating gardeners maintained, the garden "will be useful for me and other people: many other families and children in need. We don't sell it to anyone. The garden is for our own consumption; for our friends and a few neighbours... it has always been like this. I already have the means to get involved with work that will benefit us all".

#### ***2.4.4 Socio-environmental implications (benefits and costs)***

The aim of the pilot was to investigate the feasibility of establishing a model of waste management that not only improves the local environment but also contributes to establishing a more equitable and inclusive society. Thus, attention now turns to the implications of an integrated system in terms of the impact on livelihoods, the local environment, and occupational health.

##### *Livelihoods based on waste as a resource*

Following Scoones' sustainable livelihoods framework, the extent to which integrated organic waste management can sustain livelihoods depends on the ability of the system to "maintain productivity when subject to disturbing forces, whether a 'stress'

(a small, regular, predictable disturbance with a cumulative effect) or a ‘shock’ (a large infrequent, unpredictable disturbance with immediate impact)” (Scoones, 1998, pp. 6-7). Integrated organic waste management can reduce livelihood vulnerability and increase resilience by enhancing income-generating opportunities and food security.

The *catadores* have the potential to derive income from organic waste in a similar fashion to their existing income generation strategies for non-biodegradable recyclable material; they can sell the food waste to intermediaries who carry out the processing into fertilizer, while simultaneously gaining income from the municipal government for their services in diverting waste from landfill. A remuneration agreement for organic waste, similar to that already in place for non-biodegradable material, would channel financial resources usually reserved for the disposal of food in landfill directly to the *catadores*. The municipal government of Diadema currently remunerates the *catadores* at a rate of R\$38 (US\$16.7) per ton (907kg) of non-biodegradable waste diverted from landfill. Had the existing remuneration rate been applied to the collection of organic waste, the *catadores* would have earned R\$4.99 (US\$2.30) each week during the pilot study. However, simply adding two more collection routes (which would correspond to their collection routes for non-biodegradable material) with 2 collection days per week would increase income generation to R\$14.97 (US\$6.90) per week. This income could be supplemented with revenue from selling the food waste to composters or processed compost to farmers and landscapers.

Thus, organic waste collection establishes a parallel resource-base, allowing for livelihood diversification. Relying on a single resource, or a single supply of resources, is not a viable means for sustaining livelihoods, making diversification opportunities

particularly valuable. This has become increasingly apparent recently, with the global economic crises placing downward pressure on the price of recyclable material. In between January 2008 and January 2009, the value of aluminium as a tradable recyclable material dropped from 3.5 *Reais* (R\$) (US\$1.97 at the time) per kilogram to R\$1.7 (US\$0.73 at the time) per kilogram (Gutberlet, 2009). Introducing diversification opportunities through organic waste collection helps the livelihoods of the *catadores* to absorb large-scale economic shocks of this kind.

Integrated organic waste management also has the potential to enhance livelihood sustainability by increasing production on community gardens, thereby enhancing food security and income-generation opportunities (Bhattacharyya, et al., 2003; Means, et al., 2005; Montemurro & Maiorana, 2007; Olowolafe, 2008). The contribution of integrated organic waste management extends beyond direct production for self-provision, which increases food security at the household level, as it creates a local system of value production for exchange on two fronts. First, there was reciprocal exchange of labour and food amongst community residents, *catadores*, community gardeners, youth at *Fundação CASA*, and potentially the local school. This metabolic process of recycling labour and nutrients makes progress towards an equal distribution of food production, in terms of both inputs and outputs. Second, surplus compost and/or food produced by the community gardeners can be sold on the market. As Mougeot (2006, p. 58) points out, “[g]rowing and processing food in cities creates a lot of employment, many thousands of part-time and full-time jobs... it helps to reduce the economic uncertainty that comes with unemployment and employment instability, meaning there will always be food on the table”. Interviews at gardens across Diadema and Santo André revealed that income

generation has become common-place, as local residents have formed into groups to collectivise their resources and maximise the benefits of selling food on the market. Gardeners at *Jardim Inamar* revealed that the collective marketing of food has brought increased income generation. The garden at *Fundação CASA*, however, has not yet expanded to production for market exchange, and the focus of the gardeners remains on production for self-consumption and non-profit, reciprocal exchange. The gardeners are, however, amenable to selling surplus food in order to invest in improved infrastructure. As a gardener explained, “it is more important to exchange than commercialize it. But if there are a lot of leftovers, we could even find someone to sell it for us and buy shovels maybe, tools, anything else we need... it would also be an income for me. Any 20, 30 reais would be profit. But it is good for now”.

However, in affirming the potential of organic waste-as-a-resource for livelihood strategies, it is inevitable that conflict will result over this new-found resource. During the pilot study, practical conflict emerged at the household scale over the use of food waste as a resource. A form of passive conflict affected the supply of food waste, as 11.1% of residents expressed a desire to use food waste for their own purposes (such as on their own gardens and plants, and for feeding pets). This does not contradict the environmental goals of integrated organic waste management, but it is likely to present livelihood conflict in the long term, as resources become increasingly scarce. Ideological conflict emerged at the community scale, as 22.2% of residents perceived working with food waste as dirty and 8.9% considered organic waste to be a pollutant in their neighbourhood. This reflects a dichotomy between “waste as an asset” and “waste as an assault” (Ackerman & Mirza, 2001), a dichotomy that can lead to violent conflict. In

January 2009, *posto do Centro* was destroyed in a fire that was believed (by local PSWM staff) to have been intentionally started by local residents who were unhappy with the piling material. Perceptions of waste remain hugely divergent, and work remains to be done in terms of advocacy and knowledge translation and mobilisation in order to reduce the vulnerability of the *catadores*. Indeed, similar conflict has been evident elsewhere, such as the fires in several other recycling depots in the metropolitan region of São Paulo and at recycling centres in Cape Town, South Africa (Miraftab, 2004a). The informal recycling sector has become a competitive market, characterised by economic instability, dependency on intermediaries, and conflict over waste catchment areas.

Socio-economic conflict also emerged in relation to the use of urban space for community gardening. At Jardim Santa Elizabeth – a garden in the Villa Nogueira region shortlisted for the pilot study – community gardening groups have endured a long struggle with local residents seeking to expand their informal settlement. According to the community gardeners interviewed on-site, the local residents adopted aggressive strategies, such as the up-rooting of crops, in an attempt to make the land available for (informal) housing development. While slightly removed from the concept of conflict over the use of food waste, conflict over urban space is nonetheless important, as the *catadores* require reliable demand and a secure space for the delivery of the material.

Conflict over urban space also conjures debates about access to land and security of tenure. A lack of legal land tenure agreements is often a major barrier to successful urban agriculture projects (Bouraoui, 2005; Cissé, et al., 2005; Ellis & Sumberg, 1998; Mougeot, 2006; Premat, 2005; Spiaggi, 2005). In Diadema, urban agriculture is a relatively new policy venture, and the implications of land tenure arrangements have not

yet surfaced. Interviews with municipal representatives and staff at *Fundação CASA* revealed that no concrete tenure agreements exist; the land at *Fundação CASA* remains under the control of the *Fundação* and can be revoked at any point. Similarly, other urban agriculture locations in Diadema remain on municipal land that is effectively on loan. As a representative of the *Departamento de Abastecimento* explained, “the city hall is not going to give possession of these areas to the people. They are merely for title of utilisation with urban agriculture”. Although municipal representatives maintain that the land will remain dedicated to urban agriculture for as long as community members tend the land, the municipality retains the right to retract the land for alternative purposes.

#### *Environmental and health issues*

Diverting the biodegradable proportion of municipal waste has an exponential impact in reducing environmental hazards at landfill sites. On average, the *catadores* collected 0.86 kg per capita of food waste per week during the pilot project. This represents 37,126.2 kg of food waste per week that can be diverted from landfill within the Centro District of Diadema alone <sup>8</sup>. The recovery and food waste not only reduces hazards at landfill but also decreases transportation costs and emissions.

However, as Pongrácz and Pohjola (2004) point out, there are also risks involved in taking up ownership of waste. The biodegradation of food waste results in pathogen-free compost, but this is only achieved after a period of maturation. If the compost is not

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<sup>8</sup> This data assumes consistency in the public participation rate and the socio-demographic characteristics of the Centro district as a whole. Expanding the data to the larger scale of Diadema would not take into account local dynamics, such as income, social mobilization, topography, dietary habits, housing characteristics, demographic structure, and institutional context.

allowed to mature sufficiently, the heat that is biologically produced during the maturation phase may not be sufficient to inactivate pathogenic bacteria, viruses, and helminth ova. Without effective monitoring of the compost, helminth ova may be transmitted to the food crops and cause helminthiasis, which affects 1.5 billion people globally (Jimenez, 2007). Insufficient maturation also increases the leaching of pollutants into the soil (Confesor Jr, Hamlet, Shannon, & Graves, 2009). The handling of raw food waste itself also possesses health risks, as it may contain contaminated items and pathogen-rich residues. The dangers of such pathogens were realised during the pilot study when a member of the research team contracted a bacterial infection, the origin of which was suspected by doctors to have been the raw food waste. Therefore, without rigorous monitoring of the food waste or occupational health protection, such as appropriate hand protection, the *catadores* and the gardeners expose themselves to health risks, including the contraction of *Escherichia coli*.

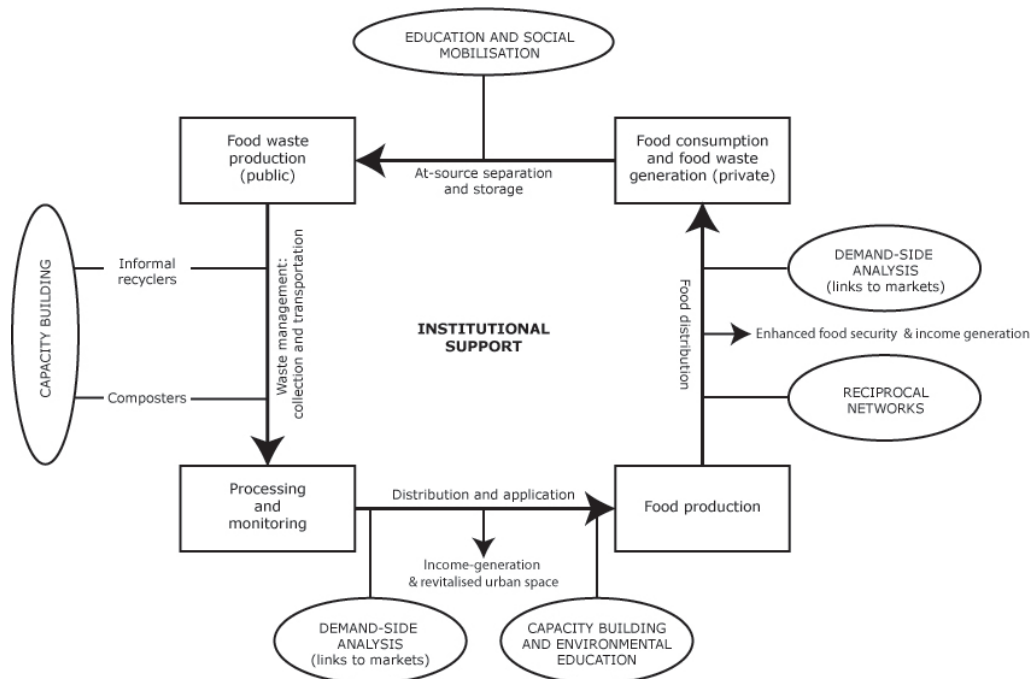
## **2.5 Conclusion: a framework for integrated organic waste management**

The pilot study revealed that the socio-economic capacity exists in Diadema with which to make links between the supply of food waste and the demand for compost, the result of which is enhanced livelihood resilience through increased income generation and food security. Integrated organic waste management, then, helps to build the community economy according to Gibson-Graham's (2006) framework. First, it celebrates the diversity of place- and community-based strategies of meeting needs, thereby placing emphasis on the assets and capacities of the community (ibid.). Second, the recycling sector in Diadema is fast becoming a model of equitable surplus distribution

in practice, as increased employment and income generation opportunities are based on co-operative ownership that locally markets surplus. In the case of the pilot study, surplus is distributed to the youth at *Fundação CASA* and plans were in place to include the local school in subsequent trials and permanent collection. Third, integrated organic waste management has the potential to create well-being without resorting to export-led development. The community takes control over resources, and dictates the ways in which they support livelihoods. Reconceptualising food waste as a resource for urban agriculture ties together social and environmental services with employment, income-generating opportunities, and local food production for the community.

Finally, the case study challenges the expropriation of the commons associated with industrial development, whereby access to resources and land is restricted through private ownership (ibid.). Although the garden at *Fundação CASA* remains a closed space, after three of the collection rounds local residents who participated in the pilot visited the garden and were offered (and accepted) products from the *Fundação CASA* garden, mainly consisting of green-leaf vegetables. However, if a local resident should care to tend the land they would have to obtain security clearance and negotiate for space with existing gardeners, which raises important issues over land tenure (explored further in chapter 3). Gibson-Graham refers to community gardening in industrial settings as an example of how access to the commons can stimulate community economic activity, but she does not explicitly explore a cyclical model of resource use. The framework for integrated organic waste management provides this opportunity, as it reflects a reconceptualisation of urban space for a more equitable metabolism and distribution of environmental amenities in the community.

Drawing on the results of the pilot study, Figure 2-2 presents a logistical framework for the cyclical links within integrated organic waste management. Binding together the practices, processes, and links is the notion of institutional support. To ensure the sustainability of waste-as-a-resource based livelihoods, these livelihoods must be recognised and validated. As previous research by the PSWM project has revealed, informal recycler's associations continue to be silenced in decision-making processes, and continue to be stigmatised (Gutberlet, 2008a, 2008b). Community gardeners in Diadema, meanwhile, lack institutional organisation altogether and are left vulnerable by insecure tenure arrangements. Thus, there is a need for deeper institutional inclusion to help establish community-based organisations that can initiate dialogue with government. Such institutions enable a bridging of the livelihood strategies of recyclers and community gardeners, and help to increase their autonomy and influence in decision-making.



**Figure 2-2 Logistical framework for integrated organic waste management**

However, in exploring the potential of a framework for integrated organic waste management, it is necessary to recognise the limits of constructing and exporting/importing such frameworks. The case study presented here explored the local articulation of integrated waste management. Consequently, the form and ultimate effectiveness of the framework presented here is dependent upon highly contingent local articulations and variables, such as local perceptions of organic waste, land-use claims, the social potential of reciprocal networks, and local policy implementation. Importing frameworks without appreciating these variables is at best ineffective. The nature of the framework, therefore, should be carefully planned to draw upon local assets and overcome local constraints. This point is well vocalised by Fehr et al. (2000, p. 250):

each country and each city has its own model or philosophy as a function of local conditions. There are no two identical models, and extrapolation or copying is not convenient. Some basic ideas may be transmitted from one place to another in order to formulate the general waste management philosophy... The final model is specific for each context, as it depends on cultural, social, demographic, geographic and economic factors, and even on personal preferences.

Given the exploratory nature of this research and the danger of exporting/importing frameworks, the future direction of research in this field should focus on building empirical evidence. Further cases need to be explored in order to validate the results found here and investigate the degree of divergence that is caused by local assets and constraints. A drawback of this particular study was the lack of a comprehensive economic analysis of integrated organic waste management. In subsequent studies, cost-benefit analyses need to be carried out not only to establish the

economic benefits vis-à-vis municipal systems, but also to account for social and environmental costs and benefits. Also required is an investigation into the form and degree of institutional support; what institutional arrangements, legal frameworks, and policy transformations are required to create a facilitative environment for integrated organic waste management?

### **3 Policies for socio-environmental equality: facilitative political frameworks for integrated organic waste management and urban agriculture in Diadema, Brazil**

#### **3.1 Abstract**

Integrated organic waste management can be conceptualised as a socio-ecological process of re-circulating environmental amenities for social equality and environmental sustainability. Such a process is mediated by the political framework within which it is embedded, a framework that is characterised by the uneven power geometries of decision-making spaces. Drawing on a participatory pilot study of integrated organic waste management, this paper explores the political framework for its implementation in Diadema, Brazil. Diadema is caught within the paradox of Brazilian politics, whereby rhetorical support for social policies such as *Fome Zero* (Zero Hunger) and *Meu Ambiente* (My Environment) contrasts their neoliberal implementation. This paper addresses the ways in which the national political paradox affects the potential for integrated organic waste management in Diadema, paying particular attention to the need for combined social and environmental policies, the political culture of project implementation, the rhetoric of public participation versus neoliberal policy enforcement, and the contested nature of deliberative decision-making spaces. For deliberative decision-making space to effectively support integrated organic waste management, government reticence needs to be replaced with the active enforcement of progressive policies, such as a remuneration agreement with the recyclers and firm land tenure

arrangements with the gardeners. Institutional links between the recyclers and the gardeners should be actively stimulated, rather than only rhetorically supported.

### **3.2 Introduction**

This paper addresses two examples of direct action from below, and explores their mutual capacity to produce more sustainable and equitable forms of urban development within the paradoxical processes of change that are occurring in Brazil. Since the Federal Constitution was promulgated in 1988, participatory institutions have proliferated in Brazil (Caldeira & Holston, 2005; Coelho & Favareto, 2008). The Constitution places the country's poor at the heart of urban regeneration efforts through a series of legal-political instruments, such as the participatory budget (*orçamento participativo*) and participatory policy councils (*conselhos deliberativos*) (Caldeira & Holston, 2005; Fernandes, 2007). The current pro-poor policies of the PT (*Partido dos Trabalhadores* – Workers' Party), such as *Fome Zero* (Zero Hunger), have helped to stimulate a loyal group of partisan identifiers (*petistas*) which has set the party apart from every other political institution in the fragmented Brazilian system (Samuels, 2008; Zucco, 2008). Cities such as Porto Alegre and Belo Horizonte have become flagship examples of how participation can extend beyond traditional unions and community associations to include unorganised sectors of the poor and working class, thereby turning the traditional logic of public resource distribution on its head (Baiocchi, 2005; Cordeiro, 2004; Fernandes, 2007). In the São Paulo region, two thirds of civil organisations working with the popular sectors participate in the new participatory institutional arrangements (Lavalle, Houtzager, & Castello, 2005), and the municipalities of Diadema and Santo André have gained

international recognition for their encouragement of popular participation (Fernandes, 2007). Urban citizenship in the metropolitan region has supposedly been reinvigorated through municipal autonomy and innovative municipal codes for public participation, and by a concomitant struggle for self-management (*auto-gestão*) (Caldeira & Holston, 2005).

However, the association of Luiz Inácio – “Lula” – da Silva and the PT with redistributive social policies shadows a deep paradox of Brazilian politics; a paradox that is characterised by symbolic rather than substantive change. Despite the PT’s mandate to deepen popular participation and safeguard the interests of Brazil’s working class, the party’s dominance has been based on Lula’s ability to play “the dual roles of neoliberal and ‘worker president’ to perfection” (Petras & Veltmeyer, 2005, p. 66). PT policy has become defined by key neoliberal postulates, which Paiva (2006) has characterised as a New Corporatism based on relations with corporate leaders rather than the working classes (as was the case with the corporatism of the early twentieth century). The result is a paradoxical political system of participatory, bottom-up social policies on the one hand, and increasing neoliberalization, the privatisation of public services, and a lack of policy enforcement on the other hand. Support for agro-industry has proliferated at the expense of local producers and the environment and in direct opposition to social policies such as the *Fome Zero* programme, which lacks any effective means of execution (Paiva, 2006; Petras & Veltmeyer, 2005).

The apparent deepening of democracy in Lula’s Brazil is not simply the result of top-down reforms; “the main mark of democratization... was not electoral politics... it was the explosion of popular political participation” (Caldeira & Holston, 2005, p. 151).

As popular political participation helped to overcome authoritarianism, neoliberalism became the new political reference point, which stimulated a contradictory context of change as urban social movements originating in São Paulo began battling against privatisation as the new logic of governmentality (Caldeira & Holston, 2005; Fortes, 2009). Marginalized populations aligned themselves locally in a bid to enhance their security in an increasingly insecure neoliberal environment (Craig & Porter, 2006). As Petras and Veltmeyer put it, “workers no longer believe Lula’s promises; they are taking matters into their own hands and moving forward. The total absence of government support and initiatives has led to increased class conflict and an increasing reliance on direct action” (2005, p. 93). Politically, however, such alignment is deemed readily co-optable by and incompatible with the macroeconomic orientation of neoliberal democracies (Duquette et al., 2005). Thus, the paradox of Brazilian politics has permeated civil society, as direct action has also made a shift to the Right in order to remain on the political agenda (Fortes, 2009).

This paper refers to two forms of such direct action. Across Brazil, a network of informal collectors – *Movimento Nacional dos Catadores de Materiais Recicláveis* (MNCR) – has emerged as a form of grassroots counter-politics to neoliberal strategies of co-optation and exploitation (Biel, 2000). The MNCR has been gaining strength since its first meeting in 1999, and in March 2008 participated in the third Latin American and first World Conference of Informal Recyclers (*Waste Pickers Without Frontiers*), which was held in Bogotá, Colombia (Gutberlet, 2008b). The national network of informal recycling co-operatives is forging a new form of economy based on values of social equality and solidarity. Perhaps no-where is this more apparent than in the São Paulo

region, where co-operatives and recyclers' organisations are building a community economy by taking control of resources at the community level and stimulating a more equal distribution of economic surplus.

While Brazil's informal collectors (*catadores*) are recovering valuable resources, community gardeners across the country are reclaiming derelict and under-used land for productive purposes. In cities such as Belo Horizonte, Curitiba, and Governador Valadares, urban agriculture (UA) is enhancing local food security and income generation, as well as providing a way for urban citizens to reclaim their community and build its capacity to sustain local livelihoods (Rocha, 2001, 2003, 2005). Urban agriculture contrasts Lula's support for large-scale agro-industry, and yet fits within his flagship *Fome Zero* programme, which Petras and Veltmeyer have dubbed "a total failure, from every angle" (2005, p. 105). During his first term, Lula cut the programme's budget by over US \$10 million, meaning that the funds allocated to feed the hungry amounted to 2.5 cents per diem (*ibid.*).

Where, then, does a model of integrated organic waste management in urban Diadema fit into the contradictory processes of change introduced above? Integrated organic waste management re-circulates the value inherent in household organic waste by integrating door-to-door informal collection with urban agriculture; organic waste is collected and processed for application on agricultural soils. Integrated organic waste management can help build a form of community economy, which directly opposes export-led development, economic growth via the free market, and the expropriation of valuable ecological regions (Gibson-Graham, 2006). Diadema, too, reflects the contradictory context of change in Brazil, as its economy relies on industry and

investments in the tertiary sector (IBGE, 2003), while its PT government is perceived as progressive in its participatory reforms. An investigation of the local articulations of Brazilian policy-making is particularly important, as few commentators have explored the ways in which the theories of a national political paradox influence the practical implementation of policies at the local level. Given the autonomy afforded to municipalities under the Constitution, do informal recyclers and urban gardeners receive the institutional and policy support that they require? Or, by contrast, are they left to face their vulnerability alone in a climate of increased competition amongst privatised services?

The following explores this context of integrated organic waste management in Diadema, drawing on field research and secondary information. A pilot study of integrated organic waste management was carried out in 2008 as an extension of an existing Participatory Sustainable Waste Management (PSWM) project, which helps to develop the capacity of informal recyclers' organisations in the São Paulo region.<sup>9</sup> The study was a collaboration with the recycling association *Vida Limpa* (Clean Life), gardeners at the community garden of *Fundação Centro de Atendimento Socioeducativo ao Adolescente* (CASA), local community residents, and local government. The study was carried out prior to the September 2008 local elections, which, despite the continuation of

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<sup>9</sup> Participatory Sustainable Waste Management is a University Partnership in Cooperation and Development project, funded by the Canadian International Development Agency (CIDA). The project began in 2005 between the University of Victoria in Canada and Fundação Universitária Santo André in Brazil. In 2008, the partnership was extended to include the University of São Paulo (USP). Through capacity building, the PSWM project helps Brazilian recycling co-operatives to increase the effectiveness and safety of the collection and processing of recyclable materials for commercialisation. By creating a space for dialogue and knowledge exchange, the project also contributes to increased awareness among governments and communities about waste co-management issues and the reduction of waste.

a PT government, resulted in a new mayor of Diadema and some changes to municipal personnel, as well as general instability and the freezing of some municipal projects. The results of the study revealed that integrated organic waste management is practically and logistically feasible, as socio-economic capacity exists to sustain a system that has positive impacts on waste-as-a-resource based livelihoods and the local environment.

However, *catadores* and community gardeners remain vulnerable, as evidenced by the burning of collection depots and the violent conflict over urban agricultural space. For these groups of marginalised citizens to continue practicing their livelihoods, they need support to alleviate their vulnerability. Without such support, their resources will be forcefully appropriated by others willing to re-circulate value for the one particular need associated with capitalist production: profit. Given that the form of integrated organic waste management presented here is not based solely on profit and that it provides an environmental and social service under-valued by the capitalist system, a supportive policy environment is required to prevent its appropriation by capital. Thus, integrated organic waste management is not sustainable without a facilitative policy framework that is built upon institutional collaboration and the mobilisation of stakeholders from civil society.

The following explores the reforms required to build such a framework, presenting evidence gathered through the analysis of participant observation notes, minutes from deliberative meetings, and in-depth semi-structured interviews. Critical content and discourse analysis reveals how the language of local politics is a situated social practice that perpetuates and reproduces political domination. As such, focus is placed on interviews with municipal representatives, which were transcribed using a

combination of *verbatim* and detailed notes.<sup>10</sup> Prior to exploring the context in Diadema, a conceptual framework is established, drawing on the concepts of deliberative democracy and advocacy coalitions. This is followed by a brief portrait of the policy context for integrated organic waste management in Diadema, before the analysis of the political culture and political discourse that was evident during the pilot study is carried out. The paper concludes with suggestions for moving policy reform forward for integrated organic waste management in Diadema.

### **3.3 Conceptualising political frameworks for integrated organic waste management**

Integrated organic waste management can be conceptualised as a socio-ecological process involving the metabolism of nature and circulation of value. The pilot study carried out in Diadema revealed that the socio-economic capacity to sustain such a socio-ecological process is mediated by political and institutional frameworks that are characterised by uneven power geometries (Figure 2-2). Socio-ecological livelihoods are determined by their context; by social, political, and economic forces that constrain or enable access to and usability of environmental resources. As Scoones has pointed out, “unless we understand the social structures and processes through which sustainable livelihoods are achieved, a description of the relationships between variables and outcomes is somewhat limiting” (1998, pp. 11 - 12). For waste-as-a-resource based livelihoods to be viable and sustainable, the surrounding political and institutional framework must be supportive of these livelihoods and must make tangible links between

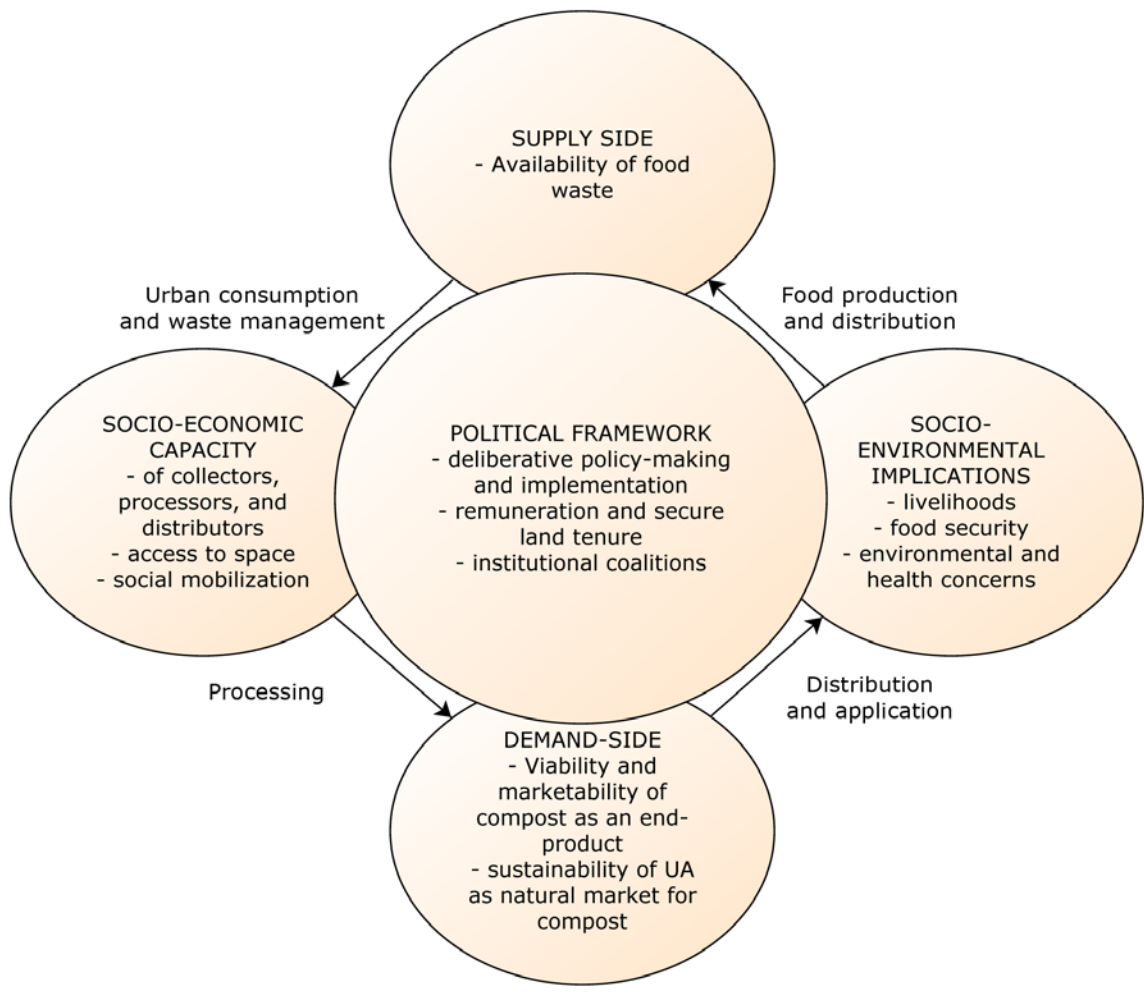
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<sup>10</sup> All interview respondents released the use of their names (as approved by the Human Research Ethics office of the University of Victoria – protocol number 08-135).

the social and environmental aspects. This indicates that urban waste-as-a-resource based livelihoods are not somehow external to institutional settings, as Cofie et al. (2006) have presented, but are intrinsically embedded within locally contingent institutional dynamics. According to Cofie et al. “a common problem leading to project failure is poor co-ordination among institutions and stakeholders due to weak institutional linkages and the lack of an enabling institutional framework, including clear legislation and policies” (2006, p. 216). Yet their framework for a nutrient recycling loop, which was tested in Ghana, merely presents the logistical and planning capabilities of local institutions, and does not address the uneven nature of decision-making processes within and between stakeholder institutions. Thus, the case-studies from the Philippines (Duran Jr., Batac, & Drechsel, 2006) and Ghana (Adam-Bradford, 2006) address practical questions of composting procedure and fail to fully address the complex socio-political dynamics of integrated organic waste management.

Within the supportive political framework presented in Figure 3-1, therefore, a form of deliberative policy-making is featured as a means to overcoming the uneven power geometries that underpin the use of waste-as-a-resource. Deliberative policy-making facilitates a bottom-up process of producing more equitable urban environments through a “democratically controlled and organized process of socio-environmental (re)construction” (Heynan, et al., 2006, p. 13). A form of action-oriented urban political ecology, as proposed by Heynan et al. (2006), enhances the democratic content of socio-ecological urban environments by supporting strategies that aim for a more equitable distribution of social power and political decision-making. The focus of the analysis below is on how the stakeholders in integrated organic waste management were included

in the everyday deliberative decision-making spaces in Diadema. First, however, it is necessary to establish the extent to which deliberative decision-making can forge supportive and accountable political frameworks.



**Figure 3-1 A conceptual framework of integrated organic waste management**

### *3.3.1 Deliberative democracy*

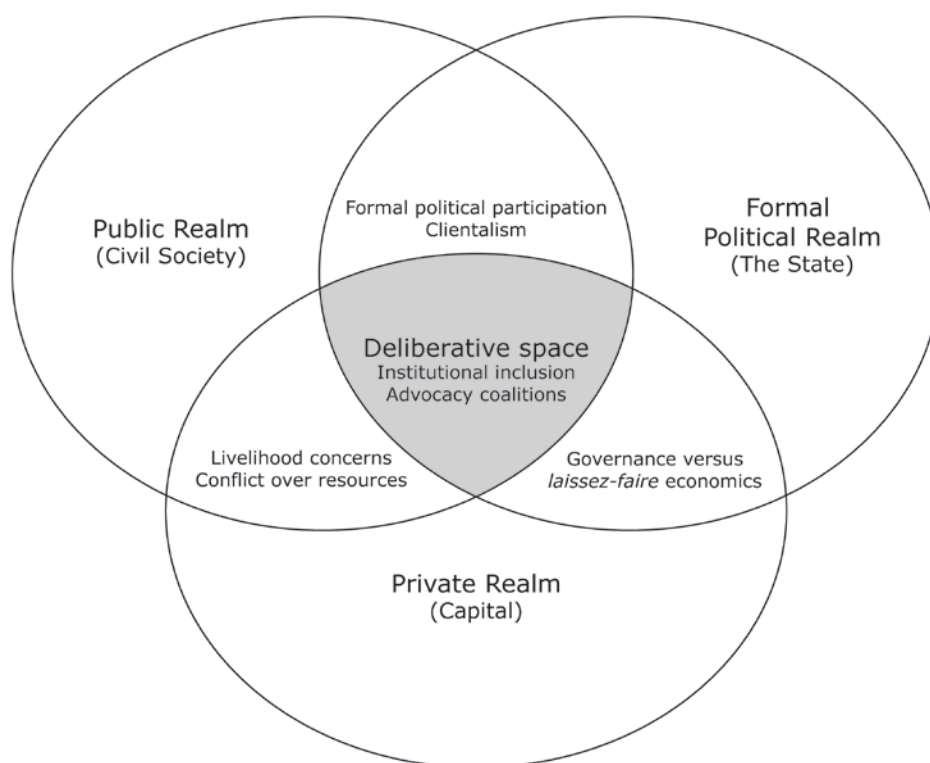
The disembedding of social relations under neoliberalism defuses rights demands, makes material demands primary again, and prioritises an “elite” democracy over a “popular” democracy (Foweraker, 2001). Conventional politics, therefore, carries little weight (Goirand, 2003), and according to Craig and Porter (2006), a form of Polanyian enlightened social reaction is required to re-embed community control and security for the poor. This is associated with a re-politicization of development, a re-politicization that overcomes the reticence of governments and establishes facilitative political frameworks for the bottom-up construction of sustainable communities. Such frameworks foster effective participation and “positive interplay between government commitment, civic virtues, and supportive institutional design” (Schönleitner, 2006, p. 35). According to Coelho and Favareto, “by giving a voice to groups who have traditionally been marginalized and by encouraging participation, negotiation, and cooperation between various social segments, the trust and coordination between them would be increased, which in turn would contribute to the promotion of development projects that coincide with their needs and interests” (2008, p. 2939).

Perspectives on precisely how to construct such a deliberative space for civil society engagement in policy-making remain polarised between the liberal and Post-Marxist camps (Oldfield & Stokke, 2007; Oxhorn, 2006). Both perspectives have their drawbacks; the former depoliticises development and over-emphasises the individual at the expense of the collective, while the latter over-determines civil society activism (Friedmann, 2005; Oldfield & Stokke, 2007; Oxhorn, 2006). There is a need, therefore, to move beyond liberal notions of assumed social citizenship (Goirand, 2003), while at the

same time recognising that civil society does not possess some innate democratic quality by virtue of its “civicness” (Schönleitner, 2006). Not all popular or civic movements “democratise democracy”, and civil society cannot be assumed to be a site for progressive politics (Gledhill, 2006; Oldfield & Stokke, 2007). As Schönleitner (2004, p. 97, emphasis original) puts it, “there is *no automatic translation of vibrant community into civic engagement with the polity*”. Moreover, an over-emphasis on some innate civic responsibility can in fact disempower grassroots movements and place real limits on the potential of bottom-up political action (Gledhill, 2001; Peck & Tickell, 2002). Gledhill illustrates how Giddens’ call for “civic responsibility” is a moralising slogan that calls upon the poor to “accept the logic of capitalist restructuring and help themselves into the opportunities provided” (Gledhill, 2001, p. 139). Failure to accept such opportunities is then cast as an individual moral failure, as local actors are given responsibility without power (Peck & Tickell, 2002). In Brazil, the result has been a fragmentation of grassroots movements, as a politics of the Third Way has emphasised individualised solutions that reinforce differentiation based on class and power (Gledhill, 2005). In this context, the “neoliberal rhetoric of ‘helping the poor help themselves’ via the ‘thickening of social capital’ ring[s] hollow” (Gledhill, 2005, p. 94).

Political participation and grassroots concerns, then, need to be understood within a nexus of civil and political society (Lavalle, Acharya, & Houtzager, 2005). Lavalle, Acharya, and Houtzager (2005) advocate for a polity-centred approach capable of rethinking the boundaries between direct and representative forms of democracy. Such a contextualized approach focuses on the inter-dependent and contested relationship between political behaviour and civic sense (Goirand, 2003; Oldfield & Stokke, 2007), as

well as on the embedded and complex nature of power within civil and political society (Jones, 2003). This allows for a better understanding of civil society's strategic and relational collaboration with, and opposition to, the state (Oldfield & Stokke, 2007). Conceptually, this reflects Jürgen Habermas' model of a public realm of action, which overlaps with the separate realms of the state and private capital to create a deliberative public space that is characterised by associative democracy rather than coercion or manipulation (Gutberlet, 2008b) (Figure 3-2). In deliberative space, "each is accountable to all...deliberation widens the scope of accountability to a broader 'moral constituency', transcending geographical boundaries, classes, and interest groups" (Schönleitner, 2006, pp. 41 – 42). Deliberation is a way of overcoming existing political structures that prevent the convergence of elite and mass attitudes (Schönleitner, 2006). Within deliberative space, citizenship is re-cast as a dynamic process of conflict and consensus, of participation and representation, and of status and practice (Duquette, et al., 2005). Citizenship is based not on belonging to an existing political system, but "upon the right to participate in its redefinition" (Goirand, 2003, p. 243).



**Figure 3-2 A conceptual framework for deliberative space**

The particular form of deliberative space is not universal; the interaction between the three spheres determines the design, inclusiveness, democraticness, and effectiveness of the space (Coelho & Favareto, 2008). In the São Paulo region the poor obtain different levels of representation according to the type of deliberative space, and there is a need to account for the different strategic roles within each sphere (Lavalle, Acharya, et al., 2005). According to Schönleitner (2004, 2006), true bottom-up political transformation in Brazil via deliberative forums is only possible where a vibrant civil society is supported by a progressive political society based on active inclusion. The nature of deliberative space, therefore, moves on a continuum between hegemony and deliberation, between opposition and engagement, and this depends on the government's attitudes and policies towards civil society (Oldfield & Stokke, 2007; Schönleitner, 2004, 2006).

For Schönleitner (2004, 2006), deliberation is not simply the result of a bottom-up process of democratization, but relies on a concomitant top-down process of crafting an alternative civil-political society matrix, based on local institutions and heterogeneity. Local political agency, formal party politics, political culture and ideologies, and the cultural propensity to challenge power are all important in determining the extent to which deliberative space can become an effective democratic force (Cornwall, 2007; Schönleitner, 2004). To move beyond the romanticised notion that civil society can produce democratisation alone (Lavalle, Castello, & Bichir, 2008; Schönleitner, 2006), an appreciation of local interactions and assimilations is required. Deliberative processes are embedded in local institutional structures, which mediate the form of deliberative space and the links between democratization and development (Chan, 2002; Schönleitner, 2004). Deliberative democracy is plagued by the dilemma that the structure of deliberative space will always in part be a product of the conventional politics in place (Schönleitner, 2004, 2006). For Coelho and Favareto (2008), in Brazil, fragmentation between institutions, participatory spaces, and policies is a barrier to effective local development. According to Petts (2005), this has often been the case when deliberative decision-making has been applied to waste management issues. Thus, to build sustainable communities, there is a need for social mobilisation, legal reform, and institutional change at the local level (Fernandes, 2007).

Despite Brazil's transition to democracy, political spheres remain controlled by elitist institutions operating on a basis of clientelism and corporatism (Carvalho, 2001). This complicates the engagement of civil society in deliberative space, as participating institutions are unable to compete with the relationship between the state and its

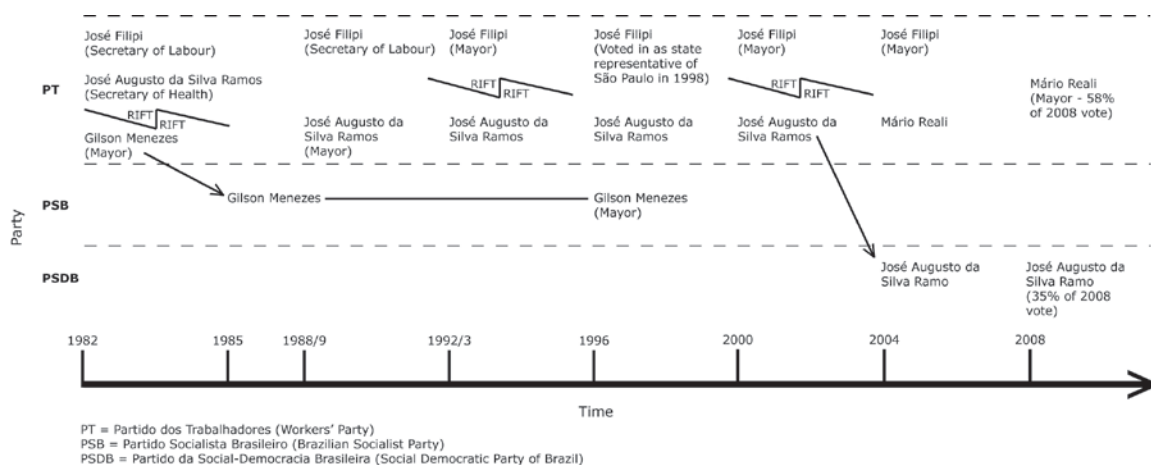
traditional allies. The question for establishing a facilitative framework for integrated organic waste management is how to organise community-driven processes that seek to appropriate a political space that is currently dominated by formal political institutions and clientelism. For Lefebvre, this dilemma reflects a conflict between domination and appropriation, “a dialectical contradiction... [that] presupposes unity as well as confrontation” (Lefebvre, 1991, p. 392). As Cornwall (2007) illustrates, such a dialectic permeates the deliberative space of participatory councils in Brazil; rather than being the reasoned space for dialogue that is often theorised, deliberative space is defined by passionate, combative, and agonistic politics. Deliberative space, therefore, is highly politicised, and contestation shapes and defines democracy within the space. Therefore, there is no pure, pre-determined deliberative space; it is a highly space- and time-contingent process and the results vary accordingly. This is illustrated by Cornwall’s account of deliberative health councils, where “different people manifest different democratic tendencies at any given moment in the process” (2007, p. 26). It is, therefore, the balance between reason and passion, between dialogue and combat that defines the outcomes of deliberative processes.

Understanding the nature of facilitative political frameworks for integrated organic waste management becomes a matter of discerning the interactions and power geometries within and between institutions. Focus here is on the routine processes that constitute deliberative decision-making in Diadema. Deliberative space consists of the informal discussions, the meetings, and the ideologies that define the interaction between political and civil society; between the recyclers’ organisations and community gardeners on the one hand and local government on the other. Emphasis on what Lefebvre (1991)

would call the “everyday” reveals how political context and political ideology feeds into policy practice and the local level, which helps us to uncover how we can overcome what Heynan refers to as the “unimaginative political processes that tolerate urban inequality” (2006, p. 139). Is the local policy context and local political ideology supportive of the organisation of recyclers and community gardeners for integrated organic waste management? Can social and environmental perspectives within government unite to push forward policy reforms?

### **3.4 Policy context in Diadema**

Diadema has spent the majority of the past three decades since the establishment of the PT under its control, indicating the left-leaning nature of politics and society in the municipality, as well as the prevalence and strength of political coalitions. In the early 1980s, the PT took office in Diadema with three central figureheads: Gilson Menezes as Mayor, José de Filipi Jr. as Secretary of Labour, and José Augusto as Secretary of Health. Despite repetitive disagreements and institutional rifts (Figure 3-3), the party has managed to maintain a substantial support base and, therefore, a stronghold on policy-formulation in the city. The nature of party politics in Brazil has helped to reinforce their stronghold, as *ex-petistas* such as Gilson Menezes (now with the Social Christian Party - *Partido Social Cristão, PSC*) continue to proclaim their support for the PT through party coalitions. As Luci Aparecida Viliane Serra (*Departamento de Abastecimento Público*) explained, “Gilson’s administration...was not very different from the political line of [the] PT...especially because PSB is also a left party, and Gilson, he kept his [political] positions”.



**Figure 3-3 Party politics in Diadema**

With a PT stronghold in Diadema, the election of Lula in 2002 sparked a wave of progressive policy reforms in the municipality, and it is often presented as an example of the effectiveness of participatory and deliberative policy-making procedures. As Luci went on to convey, Diadema is “a municipal administration [that has] a politics towards the community...like many municipal councils...that are the tools for popular participation”. Such a politics that is aimed towards the community has fed into policy formulation and implementation for waste management. “In different places” Luci continues, “it shows that the city had to develop a politics of selective collection”. Since 2002, the Diadema government has been working with the city’s *catadores*, and in 2004 strides were made towards incorporating informal recyclers into a model of resource recovery and re-use, as the municipality formally recognised *the programa Vida Limpa* (Gutberlet, 2008b). *Vida Limpa* is a city-wide programme established as an *Organização da Sociedade Civil de Interesse Público* (OSCIP – Civil Society Organization of Public Interest).

OSCIPs are local non-governmental organisations (NGOs) established through private initiative and by entering into an agreement with the Federal government regarding administrative transparency. To acquire OSCIP status, *Vida Limpa* adhered to articles 1 – 5 of *Lei 9,790/99* (Federal law 9,790 of the 23<sup>rd</sup> of March 1999), which sets out the qualifying criteria for OSCIPs. To qualify, organisations must: not have a lucrative purpose (i.e. must be not-for-profit); not also exist as any of the legal forms listed in article 2; have established social objectives according to at least one of the twelve specific criteria set out in article 3; possess an official mandate according to the criteria established in article 4; and, present to the Ministry of Justice authenticated copies of the documents required according to article 5.

Possessing status as a not-for-profit (or a non-lucrative) organisation in Brazil does not rule out economic activity, but rather than appropriating surplus capital for personal or corporate gain, OSCIPs redistribute surplus according to the social objectives established in its mandate. The labour carried out by the OSCIP members is covered by a policy of remuneration, rather than by payment derived from profit (Ferrarezi & Rezende, 2001). Registering *Vida Limpa* as an OSCIP helped Diadema to become the first municipality in the country to support informal recyclers with an official policy of remuneration. Established in June 2004, the policy incorporated the network of *catadores* into the city's solid waste programme and recognized the benefits of a partnership between government and recyclers. The policy was entrenched in 2005 by the municipal signing of a partnership memorandum, *Pacto Ambiental* (Environmental Pact) (Gutberlet, 2008a). In 2008, there were six fully functional *postos*, with plans in place to expand to fourteen. *Posto do Centro*, which provided the infrastructure and capacity for this pilot

study, was established in June of 2007, and joined the other five *postos* under the umbrella association of *Pacto Ambiental*.

The municipal government of Diadema is also proactive in its policies aimed at enhancing food security and nutrition. In 2003, Diadema established *CONSEAD* (the Diadema Council on Food Security) to operate within the national *Fome Zero* programme, a strategy to ensure the human right to adequate food for people with difficulty of access (Ministério do Desenvolvimento Social e Combate à Fome, undated-a). Diadema is among the municipalities most responsive to the federal government's social agenda, establishing *bancos de alimentos* (food banks) and a *restaurante popular* (people's restaurant), which helped provide 900,000 kg of food to approximately 15,000 people in 2006 (Gutberlet, 2007). The municipality also enacted a land and citizenship project to help resurrect a culture of agriculture and transform idle urban space into productive agricultural land. As a result, a network of *hortas comunitarias* (community gardens) has emerged in the city, supported by the *Departamento de Abastecimento Público* (public provisions). The achievements of Diadema's social and food security programmes have been featured as a case-in-point within federal publicity material (Ministério do Desenvolvimento Social e Combate à Fome, 2008).

The autonomy afforded to Diadema by the PT at a Federal level has allowed it to emerge as a progressive municipality of Brazil in terms of waste management and food security policy-making. However, the municipality remains locked into the broader dichotomy of Brazilian politics: ideological support for social policies, contrasted by poor enforcement, lack of tangible support, and an increasing reliance on the private sector. The turmoil of party politics and coalitions in Brazil results in chronic instability,

particularly during election periods. Thus, political divergence and party fractions in Diadema have often prevented adequate support for recycler's associations such as *Vida Limpa*. During pre- and post-election periods, the enforcement of government legislation rapidly disintegrates. In the case of *Vida Limpa*, political instability resulted in the freezing of remuneration payments for a whole year, which prevented the organisation from processing and distributing recyclable material. Local residents grew intolerant of the piling material, and in January 2009, the *posto* was destroyed by a fire that local PSWM staff believe was ignited by the residents. In the aftermath of the fire, the municipal government continued to fail in policy enforcement and offered little support to *Vida Limpa*.

Thus, the inclusion of civil organisations such as *Vida Limpa* in the political realm remains symbolic rather than substantive. In late 2008 and early 2009, there were five fires in the São Paulo region that destroyed four different recycling depots, all of which lack sufficient support from the municipality to re-build their operations and are left vulnerable by their inability to acquire status as a social co-operative. Recyclers' associations in Diadema are unable to apply for status as co-operatives due to the bureaucratic procedures and stringent specifications required. OSCIPs differ from social co-operatives, which are able to generate profits and are governed by articles 1,093 – 1,097 of the 2002 Civil Code (*lei 10,406/02*). Social co-operatives must have a minimum number of members who purchase a limited value of shares in the capital stocks of the co-operative, and these shares cannot be transferred to broader society or to third party individuals. Groups of informal workers are unable to meet this requirement that ownership is distributed and restricted amongst shareholders, meaning that recyclers'

associations are restricted to OSCIP status and are unable to acquire status in the formal capitalist system. Restricting recyclers' associations to OSCIP status, therefore, prevents them from gaining economic independence; they remain locked into and dependent upon remuneration from government, which restricts their autonomy and perpetuates vulnerability, especially in the volatile political climate of Brazil.

The situation is similar for community gardeners, who lack the formal organisation that allows recyclers to influence decision-making processes. The land and citizenship project that has helped community gardens to develop in Diadema is relatively young, and as yet no formal activities have been undertaken to help gardeners form into organisations or co-operatives. Such a lack of collective organisation leaves community gardeners vulnerable to the insecure land tenure arrangements surrounding urban agriculture in the city. As George Franklin do Carmo Figueiredo (*Departamento de Abastecimento Público*) explained, "all the projects are in public areas. The city has no intention of giving the land to the people; they can only use the land for urban agriculture". This perspective stands in contrast to the policy advances made in relation to urban land use under the 1988 Federal Constitution. The policy of *usucapião urbano* (urban prescription) was established under the Urban Policy section of the Constitution and as part of the concession of the real rights to use, which provides legal and material rights to land. *Usucapião urbano*, "establishes the possibility of creating an uncontestable title of ownership for residents who have lived continuously for five years and without legitimate opposition on small lots of urban land" (Caldeira & Holston, 2005, p. 154). By contrast, the recognition of land tenure rights for production is not currently placed within

the broader, multi-sectoral processes of urban policy in the Constitution, and is poorly enforced as an isolated policy (Fernandes, 2002).

The ability of community gardeners to continue working public lands depends, therefore, on the current political whims of the local government; should there be a shift in political emphasis away from *Fome Zero*, for example, the municipality possesses the power and right to instantly retract their land offerings. Land insecurity of this kind is frequently cited as a major barrier to effective and sustainable urban agriculture projects (see, for example: Cissé, et al., 2005; Mougeot, 2006; Mubvami & Mushamba, 2006; Premat, 2005; Spiaggi, 2005). Without legal protection, community gardeners are not only left vulnerable to the changing whims of the local ruling elite, but are also disempowered in the legal fight for land-use rights against local residents seeking to expand informal settlements. In Diadema, insecure tenure has led to continuous conflict with local residents, such as at *Jardim Santa Elizabeth*, where residents adopted aggressive tactics to force community gardeners off the land and make it available for informal housing development.

### **3.5 Evidence from the pilot study**

While the autonomy afforded to Diadema has allowed it to emerge as a progressive municipality of Brazil, the municipality is locked into the broader paradox of Brazilian politics: social policy rhetoric versus neoliberal policy implementation. For Neto and Coelho (2008), this reflects the Brazilian development policy of economic prosperity at the expense of political stability. The following explores the ways in which the paradox of Brazilian politics affects the political framework for integrated organic

waste management, paying particular attention to the coalescence of social and environmental policy perspectives, political culture and discourse revealed during the study, and routine interaction between political and civil society.

### ***3.5.1 A coalescence of the social and environmental***

The interviews carried out with municipal representatives revealed the compartmentalisation of policies according to traditional political distinctions. Respondents conceived waste management as environmental policy, and urban agriculture and food security in terms of social policies. Such a compartmentalisation of recyclers and community gardeners is not necessarily counter-productive for existing environmental or social policies, and may simply reflect the division of labour within the municipal government. However, as Gutberlet (2008b) has pointed out, a lack of horizontal co-operation within government is often detrimental to the development and enforcement of progressive policies. Similarly, Carvalho (2001) found that pro-environmental policy formulation is dependent on the prevailing and most powerful decision-making coalition in government, which is capable of driving or stalling policy reform. Forming a coalition between social and environmental policy-makers, then, will facilitate policy reform for progressive projects such as integrated organic waste management. Thus, for integrated organic waste management to become a viable policy option in Diadema, there is a need to reconcile the social and environmental objectives of programmes such as *Fome Zero* (Zero Hunger) and *Meu Ambiente: Diadema Cuidando do Planeta* (My Environment: Diadema Taking Care of the Planet). While there was a degree of recognition for such a need among municipal representatives, this was usually

couched in a rhetoric of problem displacement. For example, when asked how community gardens could contribute to improved waste management and the *Limpeza Urbana* (Urban Clean-up) programme, Ricardo Pérez – director of the *Limpeza Urbana* programme – responded that it was an issue for the *Departamento de Abastecimento Público* (Public Provisions) and not of his concern. The refusal to think across established departmental lines presents a significant barrier to progressive inter-disciplinary policy-making, such as the linking of organic waste management with urban agriculture.

The discord between social and environmental perspectives in local government is reinforced by the gap between discourse and practice, between the policies and the ground. Despite recognising “the value that exists in doing this marriage between the social and environmental”, as Marco Fialho (*Departamento de Habitação*) put it, there remains a lack of action on the ground to realise this value in material practice. Indeed, Luci Aparecida Viliane Serra (*Departamento de Abastecimento Público*) recognised the need for the municipality to “intervene actively in various ways to promote the necessary conditions for the implementation [of policies]: education, access to food, generation of income, preservation of the environment, etc.”. Currently, social and environmental policies exist on paper, but there remains a lack of formal procedures for their implementation. At a *Fome Zero* meeting held at the Diadema city hall, programme representatives recognised the value of integrated organic waste management. However, instead of helping to provide the practical grounds on which to establish an integrated system in the city, the representatives quickly advanced to ideas of commercialising the compost production system without considering the social and technical aspects outlined in chapter 2 or the political frameworks required to support an informal economy based

on organic waste-as-a-resource. This reflects Marx's recognition that the state emerges in order to manage the expansion of capitalism and "ensure the economic conditions necessary for accumulation" (Smith, 1984, p. 72). In this context, such expansion is predicated upon an informal working class that is under-remunerated for its (exploited) contribution (Biel, 2000). Indeed, Ricardo Pérez (*Limpeza Urbana*) revealed that, from 2009, 6 million Reais will be invested in the *Vida Limpa* programme, but such investment will focus simply on building new *postos*, without taking into consideration the social costs and values involved (including conflict and under-valued labour). Thus, the municipality is set to invest in infrastructure that will perpetuate the exploitative dualism of informal and semi-formal recycling.

### ***3.5.2 A political culture of contested (in)action***

The national political paradox affected policy implementation at the local scale during the pilot study. There was rhetorical and ideological support for integrated organic waste management from the outset. The three departments of *Habitação* (Housing), *Limpeza Urbana* (Urban Clean-up), and *Abastecimento Público* (Public Provisions) all gave their theoretical commitment to facilitating the implementation of the pilot study in the short term and the planning of integrated organic waste management initiatives in the long term. However, the project eventually became prone to what Gutberlet has previously described as "overly extensive bureaucratic procedures prone to rivalry, corruption and inefficiencies [that] can be major institutional barriers" (2008a, p. 661). For example, the municipality only provided the promised collection cart once the personal political prowess of particular municipal representatives had been enhanced

through association with the project. Photos were taken of a municipal representative participating in one of the pilot collection rounds and dressed in a *Vida Limpa* uniform, thereby allowing the representative to claim ownership of the pilot for political gain. While this may appear to be a common publicity stunt, the importance lies in the fact that the relationships are personalized, *continuous*, and informally reciprocal, which according to Keefer are “characteristics sufficient for reputational equilibria to exist in a non-cooperative game” (2005, p. 7). Indeed, according to the *catadores*, such incidences are merely a reflection of a long-standing political relationship with municipal representatives, who continuously appropriate *Vida Limpa* gains for their own benefit. Indeed, it is also evident at a broader scale, as the local government has often capitalised on its association with the recycling programme. Although the collection cart example did not create an impassable barrier to the pilot, the process is indicative of a political culture that is characterised by pluralistic reciprocal arrangements and the cultural phenomenon of *jeitinho*.

*Jeitinho* is colloquially referred to as “the Brazilian way” and has been defined within academia as a way of using one’s informal social or personal resources to accomplish goals (Barbosa, 1995). According to Barbosa (1995), *jeitinho* identifies the spaces and processes that sit between favour and corruption, between what is socially desirable and what actually happens in practice. This creates opportunities as well as constraints, and *jeitinho* is frequently applied in formal political spheres as well as informal realms (Barbosa, 1995). Thus, *jeitinho* transcends class boundaries, which complicates the position of the *catadores* and community gardeners within decision-making forums. While favour and clientilistic corruption bind the less powerful actor into

formal dependency, the deployment of *jeitinho* relies more on informal individual social skills. To “give” or “receive” a *jeitinho* there is a set of “rules” that everyone must follow, and it is the way in which the individual pursues *jeitinho* that is fundamental to its success (Barbosa, 1995). Those traditionally marginalized from decision-making circles, therefore, must quickly learn how to utilise their social assets so as to effectively deploy *jeitinho* within decision-making scenarios.

Thus, while *jeitinho* does not imply a hierarchy between its respective users, the pilot study exposed the phenomenon as an uneven socio-political drama played out by the well-connected and powerful actor on the one hand, and the marginalised, less powerful actor on the other. Although *jeitinho* is not a resource for the powerful to impose such a hierarchy (for it is universal and democratic by nature) (Hess & DaMatta, 1995), its effective deployment does depend on a set of learned social skills. Thus, while *jeitinho* can be “an equalizing and humanizing institution”, its deployment within uneven political scenarios means that “it contributes to the reproduction of hierarchy and personalism” (Hess & DaMatta, 1995, p. 31). In this context, the deployment of *jeitinho* defines, and is defined by, an inherently uneven interrelation between political and civil society. This reflects Cornwall’s (2007) recognition that elements of the “old” Brazil, such as authoritarianism and uneven patronage networks, exist as dialectically embedded cultural practices within the new political spaces of every-day deliberative decision-making. The result for *Vida Limpa* is resentment of local government, as they deem certain representatives as untrustworthy. The visit of municipal representatives to *Vida Limpa* *postos* results in a vivid transformation of *catadores* from the engaged, mobilised, and positive attitudes of the everyday *posto*, to the timid and silenced attitudes associated

with municipal interaction. Such characteristics affected the processes of the pilot study, as the researcher had to be mindful of where both *Vida Limpa* and the local government perceived the research and the researcher. To be perceived by *Vida Limpa* as another arm of municipal interference would have resulted in a lack of trust, while alignment with *Vida Limpa* posed the danger of alienating municipal support.

### ***3.5.3 Public participation versus neo-liberalisation***

Analysis of the interviews revealed that embedded cultural practices and the paradox of Brazilian politics have permeated the supposed autonomy of municipal policy formulation. As with national political discourse, the interviews are characterised by strong rhetoric of public participation, social mobilisation, and civil organisation. All of the municipal respondents mentioned public participation as an important factor within existing programmes and for the potential of integrated organic waste management. Of the coded interview content, 36.55% pertained to “perceptions of participation and social mobilization”, a theme permeated by PT rhetoric of public participation:

Selective collection does not depend solely on the catadores; it depends on the quantity of mobilization of the population.

(Denise Gorczeski, *Secretária de Comunicação*)

The municipality must “not treat the population as if they are [trained] seals...We should develop in them their critical thinking: ‘hold on, why do I do this? Why do I produce this huge amount of waste every day?’... I think it is a central point, if the people say, ‘okay, this is important’... And another fundamental aspect is when it comes to working with the population, working with these issues so that people can make the changes in the way they

act...involve children in school so that children educate the father and mother...

And it is very easy to involve children in this debate, because they buy the idea and they are real engines for change, which is fantastic.”

(Marco Fialho, *Departamento de Habitação*)

“It is all about awareness. This is where I encounter most difficulties in the work: it is precisely this, to convince the people. Here in Diadema... peoples' awareness is the problem. The people do not have that culture, you know?”

(Ricardo Pérez, *Limpeza Urbana*)

The recognition that social mobilisation is fundamental to the successful implementation of socio-environmental projects is an important one. The PT places emphasis on public participation and a form of *poder público* (public power) that is capable of influencing decision-making processes. Luci Aparecida Viliane Serra (*Departamento de Abastecimento Público*) explained this phenomenon: “if there is an area where there is now a garden, and it is being very well developed – the community is going there to buy food, and if everybody is happy – no mayor will have the courage to come and say ‘no, we will take it away from here’... So, it’s a bit of a characteristic of this popular democratic government, right. The people, they have a little bit of power of decision... There are some governors [and governments] that don’t give this space to the community.”

However, stimulating such civil engagement and mobilisation is not straightforward and the process is mediated by socio-cultural values and existing power dynamics. The comment made by Ricardo Pérez that “the people do not have the culture” does not simply imply that the local population possesses wasteful habits, but rather

reflects the need for an abstract ideological transformation among the population. As Knox-Hayes has stressed, to instil the importance of reducing the environmental impact of anthropogenic activities, it is necessary to value future time or non-time, as “reduction is ultimately something that never happens...the reduction is a reflection of the counterfactual, of what might have otherwise occurred” (2008, p. 7). Similarly, in the context of local food production, Luci Aparecida Viliane Serra recognised that a culture of agricultural production and composting does not exist in Brazilian cities:

The people who live here in Diadema, they focus on what is work for them: working in industry or working in commerce... Diadema is a town where people have their heads in [the] urban. So we will get to it and will say ‘look, we will develop a project to make organic compost’; people do not give the minimum importance to the organic compost, the same way as it was with the community vegetable gardens... It is the product of the city. It would be different if you were in a rural area and said, ‘we will do a great production of organic compost’... people will have already made the link [that] this is important, that it will be distributed between the owners of sites which will achieve soil fertilisation to produce more food. Here in Diadema the people will have difficulty with this at first.

However, the perspectives of Ricardo Pérez and Luci Aparecida Viliane Serra reflect the political culture of problem displacement that exists within local government. Municipal representatives frequently cited an inability or reluctance amongst the population as a barrier to effective waste management, food security, or other community development projects. There was a persistent “othering” of the population, as they were

presented as uneducated and disengaged from environmentally sustainable alternatives. However, discussions with local residents revealed their optimism in relation to selective waste collection and the notion of integrated organic waste management. Moreover, they revealed their current practices of organic waste recycling and gardening, as well as their support for selective waste collection and initiatives such as *Vida Limpa*. For example, residents described the notion of re-using organic material as “our citizen’s duty for our own good and the environment”, and that such projects “are great for the planet, and the future of our grandsons”. Such perceptions contradict the value-laden assertions of Ricardo Pérez and Luci Aparecida Viliane Serra cited above, which portray the residents as lacking the “culture” of organic waste re-use for UA.

Nonetheless, as Marco Fialho (*Departamento de Habitação*) points out, there remains a need to develop a critical sense among the population. While the local population may voice pro-environmental values (Table 2-4), the empirical evidence from Diadema illustrates the difficulty in transforming a critical sense into critical action. Recyclers complained that “not all the households helped [to provide organic waste], in the same way that not all the households helped with solid [waste] (plastic, paper, etc.) [separation]”; and, the community gardeners were frustrated by “a lack of interest of many that don’t want to work”. Moreover, the five fires that recently destroyed recycling depots across the São Paulo region illustrate that socio-environmental education remains a daunting task.

To help mobilise those who do possess a critical sense, municipal decision-makers place faith in increasing the organisation of recyclers and community gardeners to reduce

their vulnerability. According to George Franklin do Carmo Figueiredo (*Departamento de Abastecimento Público*), community gardeners in Diadema are encouraged to organise themselves into co-operatives to facilitate collective bargaining and the commercialisation of their products. The municipality then lends support to these organised groups through capacity building initiatives. Although no explicit activities had been undertaken at the time of the study, George Franklin described the process as capacity building “as they go”, which is designed to evolve according to the emerging and developing needs of the community. At *Fundação CASA*, Tania Maria Rezende welcomed such capacity building and encouraged the creation of community garden co-operatives to enhance the self-esteem and income of community gardeners. Denise Gorczeski (*Secretária de Comunicação*), meanwhile, explained the importance of organising informal recyclers:

We started organizing these recyclers. Right! Let's organize them into a co-operative. Let's empower them... So, these recyclers, they were trained and one co-operative was formed. This started the “Vida Limpa” project...It started with one depot...for these families from Diadema who lived at Alvarenga [landfill]. So, then they received a subsidy; they received a welfare...from the City to help them to sustain themselves. Then this project Vida Limpa started to grow...We started with one centre and we've grown along the years. Today we have six depots in the entire city; I think there are 70-ish recyclers...Today, they are super well organized; they have a co-operative, right. So... in a few years, they double[d]... the total collection...

...So they are people that left an unstable life, of a big economic instability, right, and nowadays they have an income..their children are in schools...they left the streets to go to a co-operative.

However, the above rhetoric of public participation and social organisation contrasts the lack of policy enforcement to support social organisations and the contradictory process of privatising public services. George Franklin's account of capacity building "as they go" reflects the fact that rhetorical policy commitments lack supportive formal structures for implementation, such as appropriate land tenure arrangements and the formal recognition of gardeners' co-operatives. The policy perspective among municipal respondents is, therefore, evocative of a politics of the Third Way, which over-emphasizes innate civic responsibility. Required, therefore, is a policy similar to *usucapião urbano* for those who make productive, yet non-domiciliary use of derelict or vacant urban space. While the land should remain public, the policy should secure the tenure of the land for those who carry out productive activities, as well as guarantee the provision of much-needed services such as a clean water supply.

At the same time, recyclers' organisations struggle in a battle against unreliable support from local government. The stress that Marco Fialho (*Departamento de Habitação*) placed on the economic gains that the municipality can derive from expanding selective collection clearly articulate this current trend:

The great challenge for the administrations is to decide between doing the service via the municipality...or subcontracting...I think that the debate here is that an economic reading is central. Why? Because...there is no public administrator who does not worry about the question of budgets...he will need to

know what it can bring as a contribution to the budget...convince the public administrator and say that if he practices this, then he will save money.

Marco Fialho's perspective reflects a disconnect between economic and social perspectives within government, as the neoliberal mandate of increasing efficiency shrouds the social benefits that can be derived from integrated organic waste management, such as community-building, social cohesion, and enhanced environmental awareness. Rather than supporting the sociality of community-based initiatives, the increased political emphasis on self-evolving and self-organising civil solutions has fragmented the collective struggle for sustainable livelihoods that has been borne by informal recyclers and community gardeners. Indeed, representatives proclaimed that the municipality would have no problem in supporting integrated organic waste management, and that any barriers would be a result of individual moral failures preventing effective participation. Such hollow support for social participation, mobilisation, and organisation was graphically illustrated by the lack of support provided to *Vida Limpa* prior to and following the fire at *Posto do Centro*, as well as by the insecurity of tenure afforded to community gardeners that has resulted in continuous community conflict. Moreover, as the affects of the global economic crisis have penetrated the deepest elements of economies and societies, recycling organisations in the São Paulo region have struggled to cover their costs and withstand exploitation by intermediaries. Local governments have withdrawn, rather than offered, socio-economic support for recycling organisations, forcing many to abandon their activities.

Thus, the rollback of tangible and substantive support from local government has disempowered grassroots organisations and placed real limits on the practical potential of

bottom-up action (Gledhill, 2001; Gutberlet, 2008b; Peck & Tickell, 2002). By not following through on their commitments (for example, through the ceasing of remuneration payments), the local government has undone the progress that had been made in presenting recycling organisations as environmental bastions. The result in Diadema was contestation with local residents, who resurrected the perception of *catadores* as street pickers dealing with “waste as an assault”, which contributed to the destruction of recycling operations. At the same time, the local government has been praising its own efforts to include *Vida Limpa* in decision-making frameworks. Thus, the liberalised support for informal recyclers and community gardeners has eroded the substance of their citizenship and has produced a form of second class “informal” citizenship, despite the enhanced political rights that accompanied Brazil’s transition to democracy (Gledhill, 2005). This reflects Miraftab’s assertion that local governments’ “depoliticized understanding of communities and processes of participation, and their presentation of communities as a single entity with homogenous interests,” (2004a, p. 252) is counterproductive to resolving the conflict that pervades deliberative spaces. The government of Diadema failed to understand the complexity that underpins recycling organisations and urban agriculture, and the result of such complacency was violent conflict and deepened vulnerability, despite the government’s claim to the contrary.

Furthermore, complacency has been compounded by the political ineffectiveness that has resulted from internal political differences at the municipal level, which spawn political conflict and detract from effective policy implementation. As Luci Aparecida Viliane Serra (*Departamento de Abastecimento Público*) described, the PT in Diadema has been plagued by in-fighting, and political rivalries can be a barrier to practical action.

The inefficiency that results from such political instability is a pervasive issue in local Brazilian politics, and is exacerbated during election periods.<sup>11</sup> The result is that for approximately one year either side of the elections, policy implementation stalls and vulnerable populations must once again fend for themselves. The stalling of political support for *Vida Limpa* indirectly caused the fire at *Posto do Centro* in early 2009; as the municipality froze remuneration payments, the *catadores* were unable to process the recyclable material and distribute it to industry. Local residents soon grew unhappy at the piling material, and according to local PSWM staff, the residents resorted to the violent tactic of arson, thus confirming the existence of different conceptions of waste in the neighbourhood and the desire to remove “waste as an assault”. In the aftermath, the municipality still failed to support *Vida Limpa* adequately, as the *posto* struggled to re-establish collection activities without the necessary infrastructure. PSWM staff have observed a similar scenario in relation to the other fires as *postos de entrega* across the São Paulo region.

#### ***3.5.4 Connecting civil with political society: contested spaces of deliberation***

The above analysis revealed the neoliberal political tendencies of the political framework in Diadema are capable of jeopardising the bottom-up formulation, support, and enforcement of effective socio-environmental policies. In a political climate characterised by an increasing emphasis on deliberative modes of decision-making, such neoliberal tendencies have implications for the ways in which civil society participates in

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<sup>11</sup> Political instability refers not to a particular risk of political coup, but to the poorly developed institutional frameworks to cope with the unstable transitions between political terms (whether the transition results in a change of government or not).

public policy decision-making processes. According to Coelho & Favareto (2008, p. 2950) “participatory governance processes actually conceive the role of marginalized actors as one of co-producers of public policies and co-generators of innovative development alternatives, principally at a local level”. In the Brazilian context, however, deliberation and public participation are encouraged but often not practically supported. Although informal recyclers’ organisations are recognised, there are few formal structures to facilitate their participation in policy-making processes, and involvement is often confined to the meetings that are convened by projects such as PSWM. The result is an uneven space that remains dominated by formal political decision-making processes and existing hierarchies of power, thereby limiting the substantive participation of less powerful civil society actors.

During the pilot study, such a lack of parity between *Vida Limpa* and the local government emerged during project discussions and meetings. On multiple occasions, representatives of *Vida Limpa* were brought to tears by the frustration of their demands being ignored. Mônica da Silva, an active and mobilised *Vida Limpa* representative at the time of the study, explained the difficulty in dealing with the local government. Members of *Vida Limpa* must continuously fight to have their concerns addressed, as they struggle to navigate the layered and bureaucratic nature of local government – only a handful of municipal representatives listen to the concerns of *Vida Limpa*, which allows for a referral of inaction to other representatives. The result is a continuous fight against a rhetoric of “it’s going to be ok”, which is rarely enforced with action. Indeed, in attempting to arrange meetings to discuss the future of the *Vida Limpa* project in the forthcoming political term (the mayor for which was yet to be decided), Mônica da Silva

experienced the lack of commitment from government, as municipal representatives repeatedly failed to attend. This presents a barrier to the effective drafting and implementation of plans that actively include recycling organisations. Indeed, *catadores* at *Posto do Centro* frequently vented their frustration at waste management decisions that had been made without their consultation, on the one hand, and the reluctance of the government to accommodate *Vida Limpa* suggestions, on the other hand. In this context, the inclusion of *Vida Limpa* in everyday decision-making realms is symbolic, rather than substantive. According to Mônica da Silva, the roots of political inaction and the lack of transparent and accountable decision-making are prejudice and dishonesty, epitomised by the perception that “she is just a *catador*”. The result, according to Mônica da Silva, is an unwillingness amongst the intimidated *catadores* to express their concerns, which clearly reveals an unlevel decision-making terrain.

Thus, for Mônica da Silva local government is characterised by hypocrisy, by symbolic gestures that are supported by dishonesty and inaction. Such inaction is exacerbated by the political instability that accompanies election periods, which, for Mônica da Silva, makes public participation and civic mobilisation particularly draining. As Marco Fialho (*Departamento de Habitação*) explained, with every political term, a municipal plan is drafted and implemented; the projects included in the plan are supported by municipal law, while those that are not included are left vulnerable to termination. Thus, at least every four years, mobilised civil society actors such as Mônica da Silva must pressure the mayor and senior municipal representatives so that the *Vida Limpa* project can continue to receive support. For Mônica da Silva such a process is unsustainable, as not all members of recyclers’ associations are mobilised to struggle

through the uneven terrain of municipal decision-making. Indeed, Mônica da Silva became so disenchanted with the turgidity of decision-making scenarios that she began to delegate representation, which compromised *Vida Limpa*'s role in the pilot project due to sporadic and unreliable attendance by the delegates – a reflection of their intimidation within the deliberative sphere. To overcome this situation, there is a need for more long-term agreements and contracts, which span political election periods and bind both the outgoing and incoming political parties and mayors. This requires continued political advocacy to ensure that remuneration and professional relations with recycling organisations are guaranteed features of the municipal plans. This will alleviate the burden of political campaigning that is currently borne by *Vida Limpa*, which is a drain on their limited capacity. Such professional relations can be reinforced by granting recycling organisations in Diadema the potential to acquire corporate or co-operative status, so that they can be incorporated systematically into municipal waste management plans rather than remain as a pool of cheap and informal labour. In this way, recycling organisations can be treated as contractors rather than as charity.

Currently, however, the power relations between civil and political society remain unequal, which raises the question of whether traditional channels, such as round-table discussions and project meetings, can foster effective deliberative decision-making spaces. According to authors such as Andrea Cornwall (2007), the contestation within policy-influencing discussions between *Vida Limpa* and the municipality reflects the passionate, combative, and agonistic politics that defines true deliberative space. As Cornwall explains, direct contestation can “play a crucial role in democratic deliberation

precisely as a means of challenging the less-than-democratic behaviours of powerful actors within a deliberative arena” (2007, p. 9).

However, evidence from the pilot study in Diadema has shown that where contestation fails to transform power relations, deliberative space has failed to listen to the voices of the marginalised and merely serves to reproduce power inequalities. In this context, contestation does not deepen democracy, but reinforces the unequal power relations that perpetuate marginalisation and vulnerability. As Soja (1989) has explained, social systems consist of situated practices and patterned relationships. These patterned relationships are mediated by power and domination in political space, which over-rides local institutions, prevailing local discourses and norms, and community organisation (Jones, 2003). Thus, contestation *per se* does not strengthen deliberative democracy. The story of Mônica da Silva illuminates the issue of contestation without transformation; despite being intimidated and brought to tears in meetings with local government, municipal representatives continue to ignore her pleas for meetings and open discussion. As she retreated from the everyday activities of *Vida Limpa*, little had changed as representatives continued to promise that “it’s going to be ok”, despite the continued lack of remuneration.

For contestation to deepen democracy, then, it must result in a transformation of socio-political relations for more accountable and transparent decision-making. Without such transformation, contestation merely reflects the frustration among marginalised civil society actors that, despite having gained a voice in decision-making forums, their perspectives continue to be ignored by formal political actors. Such an uneven nature of policy-making space is a significant barrier to effective and sustainable socio-

environmental policy formulation, for the policies will remain the articulation of municipal wants and needs, rather than an expression and enactment of community-driven perspectives for more inclusive and sustainable alternatives. If *Vida Limpa* representatives are left feeling silenced, the extent to which they are *equal* co-producers of policies, as Coelho & Favareto (2008) would argued, is debatable. Indeed, local government has used the *Vida Limpa* case to promote itself as a model socially oriented municipality. Although *Vida Limpa* has made significant contributions to policy advances, the limited form of negotiation experienced by the organisation's representatives reinforces existing asymmetries of power, and leaves everyday deliberative space open to elite capture (Coelho & Favareto, 2008; Dasgupta & Beard, 2007). The deliberative “add-ons”, as Schönleitner (2004) puts it, of symbolic rather than substantive participation are incapable of resolving such inherently asymmetrical power geometries.

### **3.6 Conclusion: Moving policy reform forward**

Informal recyclers and community gardeners in Diadema remain vulnerable and marginalised. Despite the organisation of recyclers into OSCIPs, the organisations remain “particularly vulnerable during their initial phase. Informal recyclers are marginalized by the rest of society and often suffer from lifelong exclusion” (Gutberlet, 2008b, p. 134). The drafting, implementation, and consistent and active enforcement of more supportive policies is required if livelihoods based on waste-as-a-resource are to be sustainable and viable. In order to overcome stigmatization and vulnerability, policy needs to support recyclers and community gardeners as environmental bastions through remuneration

agreements and land-tenure arrangements. Municipalities need to integrate inclusive recycling programmes actively into municipal models of waste management (Gutberlet, 2008b), rather than allowing them to remain passively as distinct phenomena. For this to occur, the relationship between the municipality and the recyclers must be based on professional relations rather than paternalism (ibid.).

Community gardeners, meanwhile, lack tangible support; participants are encouraged to self-organise into co-operatives in order to enhance their own ability to enter a free market for agricultural products. The lack of support for commercialization means that many gardeners have begun to sell their products informally direct from the community garden. While this may not harm the short-term livelihood interests of the gardeners, it does reflect deep-seated exploitation, for as Biel points out, “their activity in the informal sector provides under-remunerated inputs into the waged economy” (2000, p. 290). Community gardeners also suffer from extreme insecurity of tenure, which stands in contrast to the policy of *usucapião urbano* (urban prescription) established under the Constitution. A similar policy is required for those who make productive, yet non-domiciliary use of derelict or vacant urban space. Without such legal protection, community gardeners are not only left vulnerable to the changing whims of the local ruling elite, but are also disempowered in the legal fight for land-use rights against local residents seeking to expand informal settlements (as illustrated by the case of *Jardim Santa Elizabeth*).

The lack of over-arching support for UA and the gardeners in Diadema reflects previous findings that have emphasised a gap between policy and activities on the ground (Premat, 2005). In Diadema, the local government has implanted UA in the hope that it

will contribute to enhanced food security in-line with *Fome Zero* policy ambitions. Yet without institutional support and environmental education to stimulate social engagement, and without the local government listening to the needs of gardeners and their community, urban agriculture and its role in integrated organic waste management will remain an *ad hoc*, safety net phenomenon practiced at the fringes of the political, social, and economic realms.

Required, therefore, is “a perspective that fosters horizontal and vertical co-operation among government agencies and among the community, the public, and the private sector (Gutberlet, 2008b, p. 40). This requires municipalities to value the role of waste-as-a-resource based livelihoods not simply for their ability to help reduce municipal spending on labour and waste services, but also for their role in forging sustainable and equitable alternatives for urban development and planning. A first step towards the creation of a more supportive and facilitative political framework for integrated organic waste management involves the establishment of a firm policy of remuneration for the *catadores*. A remuneration policy already exists for the collection of solid, non-biodegradable material, and municipal representatives in Diadema expressed a theoretical interest in establishing a similar policy for biodegradable waste. As Luci Aparecida Viliane Serra (*Departamento de Abastecimento Público*) explained, “this has already been developed here in Diadema, because there is a law that assures that recyclers get paid for the solid waste collection. It would be just to add this law to the organic waste collection. I don’t see any problem with it”. The establishment and *active enforcement* of such a policy would provide the security required in the short-term to establish integrated organic waste management, as it would help to prevent the

exploitation of informal labour by both the *catadores* and community gardeners. The policy would also economically empower the *catadores* by reducing their dependency on market intermediaries.

The difficulty now lies in converting this rhetoric into firm political action, and a concerted effort is required to work through the fragmented bureaucracy. At the very least, a paradigm shift is required to go beyond the *negative* conception of non-waste in landfill to recognise the *positive* value of waste-as-a-resource for livelihood sustainability. To help forge these conceptual and practical shifts in government, individuals and groups that rely on waste-as-a-resource require a greater degree of institutional support. Informal recyclers' organisations such as *Vida Limpa* remain nominally included in decision-making processes, while their voices are silenced and their livelihoods suffer from incessant stigmatization. Community gardeners in Diadema, meanwhile, lack institutional organisation altogether. Thus, there is a need for deeper institutional inclusion to help establish community-based organisations that can initiate dialogue with government. As Mougeot has pointed out, "the organization of urban producers into recognizable groups is deemed critical... [for gardeners] to better access resources, services and markets, practice more sustainable and profitable forms of UA, negotiate the resolution of conflicts, bring their know-how, perspectives and interests to bear on policy design, and take on responsibilities in their implementation" (Mougeot, 2005a, p. 274).

For integrated organic waste management to progress as a policy option, institutional links need to be made between community gardeners and informal recyclers. Such links bridge the livelihood strategies of recyclers and community gardeners, and

help to increase their autonomy and influence in decision-making. The institutional links need to be formally recognised and actively developed to address the needs of integrated organic waste management and so that deliberative decision-making can move beyond inter-personal trust. As Parkins and Mitchell (2005) have pointed out, inter-personal trust de-politicises public decision-making processes and limits capacity for the active enforcement of progressive policies. As Gledhill (2005) would maintain, inter-personal trust hollows out citizenship and political representation, as it places emphasis on individualised solutions and shortcomings. Thus, institutional levels of trust need to be developed between government and social actors to support participatory institutions as the political product of an iterative process between the state and civil society (Lavalle, Acharya, et al., 2005). Critical trust at the institutional level is necessary for broader social and political trust in integrated organic waste management to develop in tandem with a healthy scrutiny of uneven power dynamics and social inequality. In this way, institutional coalitions for progressive socio-environmental policy reform can develop, placing social equality and environmental sustainability at the heart of substantive public participation in decision-making processes.

Ironically, the current political and economic climate opens the doors for recyclers and community gardeners to assert collectively their needs in the political realm. As Hochstetler and Friedman (2008) point out, political crisis triggers a shift from traditional to new modes of representation. Recyclers' organisations are a service providing form of civil society organisation (CSO) (Lavalle, Acharya, et al., 2005; Lavalle, Houtzager, et al., 2005), and are capable of performing political integration functions such as partisan representation – the articulation and aggregation of interests

and the integration and mobilisation of citizens (Hochstetler & Friedman, 2008). Thus, CSOs such as recycling organisations are becoming increasingly important in promoting the interests of a Latin American civil society that is attempting to introduce alternative political practices and new institutional formats. (ibid.). While CSOs cannot, and are not seeking to, replace traditional forms of political representation, they are looking to deepen the democracy of every-day deliberative processes and are providing citizens with new modes of representation that are capable of influencing political outcomes (ibid.). Both the successes and pitfalls of Lula's government have challenged Brazilian leftist political groups and social movements to find what Fortes (2009, p. 114) calls "a post neoliberal paradigm" that is capable of redirecting their long term struggles. For this purpose, the current economic crisis reflects a common Brazilian idiom that Luci Aparecida Viliane Serra voiced during her interview: "you will cover one saint, and uncover another". As neoliberal strategies of rationalisation and privatisation continue to deepen inequalities in a time of economic hardship, the door opens for organised groups of marginalised citizens to put forward their models of more equitable and sustainable livelihoods.

#### **4 Conclusion: Food-waste as a resource for sustainable communities**

The tipping of the global demographic scales in 2007 has placed increased pressure on governments and urban communities to find more sustainable models of production and consumption. As the surpluses of the capitalist system continue to accumulate at the margins of urban society, the urban poor must cope with the proliferating environmental and health hazards that follow. At the same time, the reliance on a centralised food production system in Brazil, as described by George Franklin do Carmo Figueiredo (*Departamento de Abastecimento Público*), means that marginalised urban citizens lack sufficient or affordable access to fresh fruit and vegetables. This urban incongruity of accumulating waste but a dearth of nutritional food reflects a national political paradox; despite the PT's rhetorical commitment to public participation and social policies such as *Fome Zero*, policy implementation continues to follow a neoliberal path of privatisation and withdrawal of state support. Urban environments in Brazil, therefore, remain unequal, as they are produced by a metabolism of nature that is characterised by a series of enabling (for powerful actors) and disabling (for marginalized actors) social, political, and environmental conditions. Thus, "attention has to be paid to the political processes through which particular socio-environmental urban conditions are made and remade. From a progressive or emancipatory position... questions about who produced what kind of socio-ecological configurations for whom" (Heynan, et al., 2006, p. 2) need to be addressed. In the context of the pilot study, such political processes include the community politics of working with waste-as-a-resource, formal policy-making procedures, and the levels of participation in deliberative decision-making

environments. Such processes have defined decentralised resource recovery and urban agriculture to date, and will define the role of integrated organic waste management in the future and its ability to provide a more sustainable and equitable alternative.

The pilot study of integrated organic waste management in Diadema addressed the above issues by applying an action oriented form of urban political ecology, as espoused by the likes of Heynan, Swyngedouw, Kaika, and Loftus (Heynan, et al., 2006; Loftus, 2007; Swyngedouw & Heynen, 2003). The pilot study affirmed the potential of integrated organic waste management and explored the contingency factors for its effective and sustainable implementation. Following Cofie et al.'s (2006) recommendations, a feasibility study was carried out prior to any formal establishment of a decentralised composting initiative. The participatory, action-oriented nature of the pilot study not only revealed the assets and barriers to integrated organic waste management, but also instilled in the community and local government a collective consciousness of the potential for an integrated system. Such an approach reveals how “experience is lived and acted out in place, and how this relates to, and is embedded in, political and economic practices” (Merrifield, 1993, p. 517). The following summarises the salient results that emerged from the real and lived experience of the pilot study, and explains the contributions that have been made to theory and the subsequent implications for praxis. Some of the limitations of this research are then outlined, leading to some proposed avenues for future research.

#### 4.1 Salient findings

The research in Diadema indicated that integrated organic waste management – consisting of decentralised waste collection, composting, and enhanced UA – is not only logistically possible, but also has potential positive impacts in terms of income generation through remuneration and the marketing of food and compost, the productive use of derelict urban space, enhanced food security, and a cleaner environment. Moreover, reading the results of the pilot study through Gibson-Graham's (2006) notion of the community economy revealed that integrated organic waste management supports the diversity of community-based strategies for building livelihoods, contributes to a more equitable distribution of surplus, creates well-being without resorting to export-led development, and replenishes the commons.

However, the cyclical framework (Figure 2-2), and its ability to contribute to sustainable community development, is far from uncontested or immutable. Rather, the process is mediated by locally contingent social, political, and economic variables. First, social mobilisation and environmental education are fundamental, as local residents dictate the quantity and quality of organic waste for compost. The pilot study revealed divergence between the values of the residents and their participation, which resulted in quantities of organic waste that were lower than expected. Public participation is at the heart of an inclusive and sustainable community-driven model. Educational activities are required to not only instil a critical awareness of organic waste-as-a-resource, but also to transform such awareness into what Acharya (2006) calls critical action.

Second, the capacity of the *catadores* and community gardeners to absorb the reconceived waste-as-a-resource dictates the technical feasibility of the system. During

the pilot study, the *catadores* had to cope with the density of organic waste, which required different handling techniques to that of non-biodegradable recyclable material. While they were motivated to overcome collection obstacles during the pilot, sustained collection capacity requires improvements to collection routines and technologies. Similarly, the gardeners were well equipped with the knowledge and technological skills to process the organic waste. However, the capacity to absorb an increasing supply of organic waste over a sustained period was not tested. At the heart of such capacity is the need for gardeners to have access to secure land as well as the necessary tools, infrastructure, and resources.

Third, the pilot study indicated that a reciprocal system of exchange between the recyclers and gardeners is possible at the local level. Such a system ensures a consistent demand for organic waste, and with urban agriculture proliferating in Diadema, opportunities exist to multiply or expand the reciprocal networks. However, the reciprocal network of the pilot study remains fragile, particularly due to the vulnerability of both the recyclers and community gardeners. Nor is a reciprocal network independent from broader capitalist processes, for “capital stalks the earth in search of natural resources... No part of the earth’s surface... [is] immune to transformation by capital” (Smith, cited in Braun, 2006, p. 212). Indeed, in entering a reciprocal network of exchange, organic waste takes on the social use-values of a commodity (Marx, 1976), which are open to appropriation by capital. In this scenario, “the commodity’s direct use-value to its owner is that of being a depository of exchange value” (Smith, 1984, p. 60). Thus, while integrated organic waste management and a reciprocal system of exchange offer alternatives to existing modes of production for exchange, they do remain

dialectically bound to the current capitalist system. Economic analyses, therefore, should be carried out to explore the viability of food-waste-derived compost as a commodity and livelihood resource.

Such economic analyses, however, should not follow Marco Fialho (*Departamento de Habitação*) in reifying the market; doing so will merely extend the treadmill of production, rather than promote a shift towards more cyclical alternatives. Indeed, the hallmark of a well-developed capitalist society is a division of labour between the agriculture of the country-side and the commerce of the city (Smith, 1984). Carrying out a market analysis of integrated organic waste management, therefore, is somewhat paradoxical, and may not help to illuminate the ways in which an integrated system reflects what Leitner et al. call the “alternative visions and trajectories that are being generated outside the mainstream of market-oriented politics” (2007, p. 314). Indeed, as Biel points out, “it will leave people servicing what appears to be a market but is in reality an accumulation system. The people are empowered with new choices, but in reality these are limited to seeking niches within the global accumulation system” (2000, p. 297), a system that will absorb the surplus value generated by an integrated system while saving itself the organisational effort of finding those niches.

Finally, at the heart of both the logistical framework (Figure 2-2) and the conceptual framework (Figure 3-1) for integrated organic waste management is the political and institutional context within which the system operates. While Diadema is progressive by virtue of its local implementation of national social policies, the municipality is caught within the national political paradox of social policy rhetoric versus neoliberal policy implementation. The pilot study revealed this tension, as

recyclers and community gardeners remain vulnerable in a volatile political climate. The political processes of such a climate have shaped the evolution of *Vida Limpa* as an ingredient of an alternative waste management strategy, and will dictate the role that urban agriculture and integrated organic waste management will have in the future for positively transforming urban socio-environmental conditions. Pro-active institutional support for recyclers and community gardeners is essential to overcome the symbolic gestures that have frustrated Mônica da Silva (*Vida Limpa*). Links between these institutions must also be facilitated and subsequently supported by the active enforcement of policies that remunerate recyclers and recognise the land-use rights of productive community gardeners. Moreover, relevant stakeholders must participate in the drafting of these policies; there is a need for deeper and more democratic everyday deliberation to overcome the limits of deliberative add-ons.

#### **4.2 Implications for theory and praxis**

The results of the pilot study presented here advance conceptual and empirical perspectives on waste management and urban spatial form. The work contributed to a reconceptualisation of organic waste as a livelihood resource, thereby re-conceiving waste management in cyclical terms and moving beyond the dominant linear waste management paradigm. It is surprising that, to date, little attention has been paid to the mutually reinforcing character of decentralised waste management and urban agriculture. This research, therefore, is innovative in its empirical exploration of the social, political, and economic urban dynamics that are required to initiate and sustain a system that integrates organic waste management with urban agricultural production.

In pulling together the results of the pilot study, a conceptual advancement was made by the construction of a model of integrated organic waste management (Figure 3-1). Linking the empirical evidence to theory in order to build the conceptual model has helped to reveal “the ties that bind the apparently disassociated” (Castree, 2006, p. 255). Drawing on Louis Althusser, Castree explains that a social phenomenon “cannot be defined by its immediately visible or sensuous appearance; it is necessary to make a detour via its concept in order to grasp it” (2006, p. 255). The majority of approaches to organic waste management and urban agriculture fail to make such a detour, and therefore remain locked into modernist attempts to order the material world. The research presented here has emphasised the qualitative aspects of integrated waste management in an attempt to conceptualise a sustainable integrated system, in both the abstract and material realms.

At the heart of the model are the political and institutional dynamics that mediate sustainable integrated organic waste management. The unequal power relations in decision-making contexts must be overcome in order to reduce the vulnerability of marginalised urban residents. The conceptual model reflects such a need, as it emphasises policy reforms that are focussed on public participation, remuneration, institutional building and strengthening, and land-use rights. Previously, waste management has been conceptualised as external to and independent from political and institutional frameworks. The dynamics of the political framework have often been treated merely as factors that “affect the set-up and management of composting stations” (Cofie, et al., 2006, p. 220). The conceptual model presented here moves beyond the logistical or

anecdotal treatment of political contexts to place focus on the innate inter-dependence of urban community development and policy frameworks.

However, the conceptual model remains a reflection of the pilot study carried out in Diadema; its relevance and usefulness will rely upon context-specific application and analysis, and on an ability to adapt the emphasis and sophistication of the various elements where required. The issues identified in each section of the model reflect the research findings in Diadema, and other locations and contexts may yield different results. Indeed, the dangers of importing and exporting models based on local contingencies and variables were highlighted in the conclusion to chapter two. As a whole, however, the model provides a useful framework with which to assess the feasibility, sustainability, and equality of integrated organic waste management. The model does so by identifying the need to focus on peoples' perceptions, conceptions, and subsequent behaviours, an element often ignored in the technologically focussed waste management literature and in the planning perspectives on urban agriculture.

#### **4.3 Limitations and avenues for future research**

A case-study approach was adopted for this research to investigate the phenomenon of integrated organic waste management within context (Castree, 2005); it was the local articulation of integrated organic waste management that was under investigation. While such an approach highlights local conditions within global processes, it is important not to reify the "local" or grassroots phenomena. Agrawal and Gibson (1999, p. 633) capture the danger of romanticising the community as the scale of investigation:

The vision of small, integrated communities using locally-evolved norms and rules to manage resources sustainably and equitably is powerful. But because it views community as a unified, organic whole, this vision fails to attend to differences within communities, and ignores how these differences affect resource management outcomes, local politics, and strategic interactions within communities, as well as the possibility of layered alliances that can span multiple levels of politics. Attention to these details is critical if policy changes on behalf of community are to lead to outcomes that are sustainable and equitable.

In focusing on a case-study in one community, the pilot study attended to the differences within the community, such as varying conceptions of waste, and actively explored how these differences affected outcomes, as evidenced by conflict during the pilot study. Equally, the pilot study focussed on strategic interactions between different groups within the community, and between community groups and local government.

However, while attention to detail is critical, this detail must be placed into the broader context, which is made difficult by exploring an isolated case. Although chapter three placed the policy framework in Diadema into the context of national politics and global processes of neoliberalisation, the isolated nature of the case and the small-scale of analysis hindered the ability to place the results into a broader meta-narrative. Moreover, the neighbourhood in which the pilot took place may not be representative of Diadema, or Brazilian cities in general. The pilot neighbourhood was relatively well-off and was located near to the municipal offices, meaning that waste generation characteristics, environmental education, and public participation are likely to differ from other regions of the city. The relatively small sample size of the neighbourhood – consisting of eighty-

six households on three streets – compounds this problem. Similarly, the small sample size of municipal representatives makes it difficult to extrapolate the results beyond government departments to the scale of the municipality as a whole or to other cities. Moreover, the community garden at *Fundação CASA* is not representative of community gardens in the city, and the focus of the pilot study on this site further limits the broader applicability of the results. More pilot studies are therefore required across Diadema, as well as in other cities, to validate the results presented here and to test the conceptual framework presented in Figure 3-1. To explore the potential for up-scaling the model of integrated organic waste management, subsequent pilots should also increase in size and scope. Only with further pilot studies can the salient issues that occur *across* space be explored, and a more applicable model be developed.

Methodological limitations also stemmed from the action-oriented nature of the project, particularly in relation to the participation of the community gardeners. The organised nature of the recyclers, along with their existing relationship with the municipality, allowed for their inclusion in the pilot study from the outset. On the other hand, the lack of organisation amongst community gardeners in Diadema inhibited their representation and participation, particularly during early planning phases. As an OSCIP, *Vida Limpa* also benefits from inclusion in broader decision-making spaces, while the community gardeners lack such opportunities, and are largely excluded from deliberative decision-making forums. Thus, there is a need for a more systematic inclusion of community gardeners, and for more focussed research on urban agriculture in Diadema. Little is known about the fledgling network of community gardens, and it remains a largely undocumented phenomenon in terms of concrete experiences. Research is,

therefore, required to help organise community gardeners so that they can work with organised recyclers to build a system of integrated organic waste management.

The pilot study also lacked comprehensive economic analysis. Although it was beyond the scope of this research project to carry out a cost-benefit analysis of municipal waste management versus decentralised integrated organic waste management, such an analysis may prove fundamental to the viability, sustainability, and applicability of a decentralised integrated system. More thorough demand analysis is also required to assess the ability of urban agriculture to absorb the supply of food-waste-derived compost. While further pilot studies are required to analyse the socio-political dynamics of integrated organic waste management in other locations, these should be complemented by comprehensive economic analyses that assess the gains and losses of a decentralised system. However, economic analyses should not focus simply on the insertion of food-waste-derived compost into the market. As indicated above, “capital stalks the earth in search of material resources” (Smith, 1984, p. 71), and simply offering organic waste-as-a-resource to the roaming capital does little to resolve the inequality associated with capitalist accumulation by dispossession. Just as the recyclers are currently bound by their dependency on intermediaries in the market for non-biodegradable recyclable material, channelling organic waste-as-a-resource solely through market mechanisms will perpetuate such dependency and do little to reduce the vulnerability of recyclers. Future economic analyses, therefore, should consider a regulated community-based market, similar to that proposed by Gibson-Graham (2006), rather than simply resort to insertion in an unequal capitalist system.

Finally, further work is required on knowledge translation and mobilisation and action-oriented research for policy reform. The results of this research are desperately required in Portuguese, and need to be distributed within the research neighbourhood, amongst recyclers and community gardeners, and within local government. While the fire at *Posto do Centro* presents a barrier to the circulation of results, a variety of outputs will be prepared for distribution in Portuguese. Results dissemination will build on the awareness-raising carried out during the pilot study, with the aim of encouraging a conversion of environmental values and perceptions into material practice.

Emphasis of the results dissemination, as well as future research, should also be placed on influencing policy. The results of the research have important implications for public participation in the drafting of progressive socio-environmental policies, and can be used to advocate for more consistent policy enforcement. Lacking from municipal approaches to waste management and urban agriculture is an integrated and inclusive perspective that recognises the social value of cyclical, community-based systems. Further action-oriented research is necessary to raise the profile of integrated and inclusive solutions to the problems of urban waste accumulation and food insecurity. Research must help build formal institutions for social groups such as community gardeners and recyclers, who offer alternative and more sustainable models of community development. At the same time, local and national government in Brazil needs to be held accountable for the lack of action and policy implementation during times of political instability. Social rhetoric must be supported by meaningful action, and future research must put pressure on political and institutional frameworks to ensure such action.

The current period of economic turmoil presents an opportunity for research to assert a new visibility of sustainable alternatives and invigorate support for their implementation. In Harvey's words, "we have the opportunity to create space, to harness creatively the force making for urban differentiation. But in order to seize these opportunities we have to confront the forces that create cities as alien environments, that push urbanization in a direction alien to our individual or collective purpose" (Harvey, 1973, p. 313). We must, therefore, seek an alternative to what Heynan calls the "contemporary mix of economic free-marketism and political irresponsibility" (Heynan, 2006, p. 139) that has produced urban hunger and the uneven accumulation of waste. In pursuit of such alternatives, action-oriented research links theory to praxis, and stimulates a form of community-driven sustainable urban development that is supported by effective policies.

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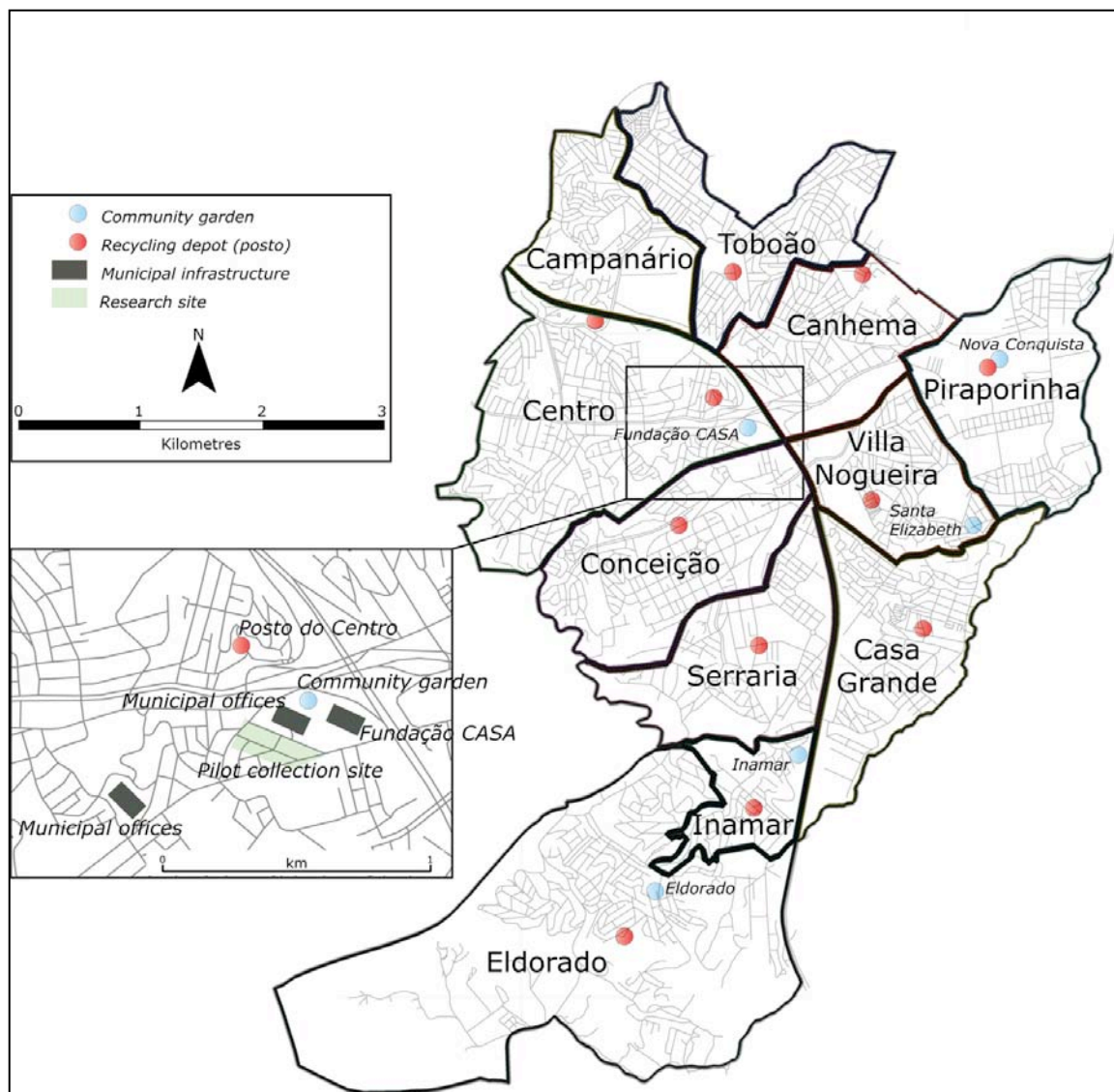
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## Appendices

**Appendix 1. Map of recycling depots and community gardens in Diadema (insert: research site)**



## Appendix 2. Household survey (Questionário paras moradores)

Data: \_\_\_\_\_ Endereço: \_\_\_\_\_ Número do Questionário: \_\_\_\_\_

### Seção 1: Contexto

1. Quantas pessoas vivem em sua casa? \_\_\_\_\_
  - a. Quantos adultos? \_\_\_\_\_
  - b. Quantas crianças? \_\_\_\_\_
2. Qual a quantidade de sacos (supermercado) de lixo que sua família produz por semana? \_\_\_\_\_
3. Você participa na coleta seletiva?  
SIM | NÃO
4. Quanto sacos de lixo a cada dois dias é material orgânico, ou seja, resto de comida?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Seção 2: Coleta de Materiais Recicláveis

1. Você sabe o que é coleta seletiva?  
SIM | NÃO
2. Você sabe como chama o programa da coleta seletiva?  
-----
3. Você fornece material reciclável para os catadores?  
SIM | NÃO
  - a. Se a resposta for SIM: O quê? Que tipo de material?  
\_\_\_\_\_
  - b. Se a resposta for NÃO: por quê não?  
\_\_\_\_\_
4. Se os catadores coletarem frutas e vegetais você separaria seu lixo orgânico?  
SIM | NÃO  
Por quê?

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5. Se não existisse coleta de material orgânico você sabe qual o destino final?

SIM | NÃO

Onde? \_\_\_\_\_

6. Em uma escala de 1 a 5, (1 sendo menos importante e 5 mais importante), o quanto você considera importante que seu lixo seja reciclado (usado produtivamente)?

1 | 2 | 3 | 4 | 5

7. Que benefícios você vê na coleta do material orgânico (restos de comida...)?

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Outros vantagens mais gerais/pessoal?

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8. Que tipo de dificuldade você acha que teria em contribuir na coleta do material orgânico?

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9. Você acha que reciclar material orgânico causaria problemas ou benefícios para seu bairro? Por que?

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10. Você separaria material orgânico para Vida Limpa

SIM | NÃO

11. Quantas vezes por semana é melhor para a coleta do seu material orgânico?

1 | 2 | 3 | 4 | 5 | 6 | 7

Seção 3: Fornecimento Local de Alimentos

1. Você conhece alguma horta comunitária no seu bairro?

SIM | NÃO

- a. Se voce respondeu sim, você sabe onde fica ?

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2. Que mudanças você acha que uma horta comunitária poderia trazer para o seu bairro?

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3. Em uma escala de 1 a 5 (sendo 1 menos importante e 5 mais importante), o quanto você considera importante que sua comida seja produzida localmente?

1 | 2 | 3 | 4 | 5

4. Sabendo que o material orgânico pode ser transformado em adubo para hortas comunitárias, isso influenciaria nos seus hábitos de reciclar?

muito | pouco | nada

5. Sabendo que o seu material orgânico ajuda na produção e distribuição de alimentos local, através de hortas comunitárias, isso influenciaria nos hábitos de consumo de comida?

muito | pouco | nada

6. Você está interessado em participar em um projeto de horta comunitária local?

SIM | NÃO

- a. Por quê?

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**Obrigado! Por favor, aceite este folheto informativo sobre processo de material orgânico e hortas comunitárias.**

**Você pode participar mais desta pesquisa antes da coleta?**

SIM | NÃO