Recycling Networks & Waste Governance

INCLUSIVE WASTE GOVERNANCE AND GRASSROOTS INNOVATIONS FOR SOCIAL, ENVIRONMENTAL AND ECONOMIC CHANGE:

REPORT ON FIRST RESEARCH OUTCOMES OF THE PROJECT *RECYCLING NETWORKS & WASTE GOVERNANCE*

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Photos: (1) *Varral PET* (washing line) micro enterprise at Coopcent-ABC, *Cooperativa Central de Catadores e Catadoras de Materiais Recicláveis do Grande ABC.* (2) Experiencing manufacture of plates with plastic materials considered "non-recyclable" at Coop Reciclando Sueños (3) The recyclers best friend: the scale, Kisumu.

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ABSTRACT - RESUMEN - RESUMO

Abstract:

Participants of two research projects (*Recycling Networks: Grassroots resilience tackling climate, environmental and poverty challenges* (funded by the Swedish Research Council) and *Mapping Waste Governance* (funded by the Social Sciences and Humanities Research Council of Canada) collaborate in offering a critical inter- and transdisciplinary perspective on waste and waste actors (waste picker cooperatives, associations, community-based organizations, partnerships, networks and NGOs). The research is conducted in the following cities: Buenos Aires (Argentina), São Paulo (Brazil), Vancouver and Montreal (Canada), Kisumu (Kenya), Managua (Nicaragua) and Dar es Salaam (Tanzania). Together we examine the challenges that innovative grassroots initiatives and networks encounter in generating livelihoods to improve household waste collection and recycling, particularly in informal settlements of global South cities. We seek to map waste governance and successful waste management initiatives, arrangements and policies involving grassroots initiatives. In this report, we present a brief description of solid waste governance in the cities where we conducted fieldwork. We then illuminate some of our findings on grassroots innovations involving waste pickers or waste workers in these cities. Both research projects combine multi-case studies of waste picker groups and local government initiatives, apply qualitative research tools and participatory action research (e.g. photo voice, participant observation, workshops, surveys and interviews). We are interested in understanding processes, challenges and opportunities related to how these grassroots initiatives and networks operate to bring about socio-environmental and economic change? How they address challenges and what the assets are in everyday waste governance that can be explored to make waste governance more sustainable and thus more inclusive? Researchers involved in these two projects, key stakeholders from grassroots initiatives in these countries, representatives from some international waste picker networks and local and regional government officials from Kisumu, Kenya, met between 23rd and 29th of April 2018, in Kisumu to present and discuss the results of the first year of research activities, which are herewith documented.

Resumen:

Los participantes de dos proyectos de investigación (*Redes de Reciclaje: resiliencia de base abordando desafíos climáticos, medioambientales y de pobreza* (financiados por el Consejo Sueco de Investigación) y *Mapeando Gobernancia de los residuos sólidos* (financiado por el Consejo de Investigación de Ciencias Sociales y Humanidades de Canadá) colaboran ofreciendo una interacción crítica y una perspectiva transdisciplinaria de los agentes de residuos y residuos (cooperativas de recicladores, asociaciones, organizaciones comunitarias, redes y ONGs). La investigación se lleva a cabo en las siguientes ciudades: Buenos Aires (Argentina), São Paulo (Brasil), Vancouver y Montreal (Canadá), Kisumu (Kenia), Managua (Nicaragua) y Dar es Salaam (Tanzania). Examinamos juntos los desafíos que enfrentan las iniciativas y redes de base innovadoras para generar medios de vida para mejorar la recolección y el reciclaje de residuos domésticos, particularmente en asentamientos informales de ciudades del sur global. Buscamos mapear la gestión de residuos y las iniciativas exitosas de gestión de residuos, arreglos y políticas que involucran iniciativas de base. En este informe, presentamos una breve descripción del gobierno en relación a la gestión de los residuos sólidos en las ciudades donde realizamos trabajo de campo. Luego iluminamos algunos de nuestros hallazgos sobre las innovaciones de base que involucran a recicladores o colectores en estas ciudades.

Ambos proyectos de investigación combinan estudios de casos múltiples con grupos de recicladores e iniciativas del gobierno local, aplican herramientas de investigación cualitativa e investigación de acción participativa (por ejemplo, foto-voz, observación participante, talleres, encuestas y entrevistas). Estamos interesados en comprender los procesos, los desafíos y las oportunidades relacionadas con la forma en que operan estas iniciativas y redes de base para generar un cambio socioambiental y económico. ¿Cómo abordan los desafíos y cuáles son los activos en la gobernanza de los desechos cotidianos que pueden explorarse para hacer que la gestión de los residuos sea más sostenible y, por lo tanto, más inclusiva? Investigadores involucrados en estos dos proyectos, actores clave de iniciativas de base en estos países, representantes de algunas redes internacionales de recicladores y funcionarios del gobierno local y regional de Kisumu, Kenia, se reunieron en Kisumu del 23 al 29 de abril 2018 para presentar y discutir resultados del primer año de actividades de investigación, que se documentan aquí.

Resumo:

Participantes de dois projetos de pesquisa (*Redes de Reciclagem: Resiliência de base para enfrentar os desafios climáticos, ambientais e de pobreza* (financiados pelo Conselho de Pesquisa Sueco) e *Mapear a Governança de Resíduos Sólidos* (financiados pelo Conselho de Pesquisa em Ciências Sociais e Humanas do Canadá) colaboram para oferecer uma interação crítica e uma perspectiva transdisciplinar sobre resíduos e os atores envolvidos (cooperativas de catadores, associações, organizações comunitárias, parcerias, redes e ONGs). A pesquisa é realizada nas seguintes cidades: Buenos Aires (Argentina), São Paulo (Brasil), Vancouver e Montreal (Canadá), Kisumu (Quênia), Manágua (Nicarágua) e Dar es Salaam (Tanzânia). Juntos, examinamos os desafios que as iniciativas e redes de base inovadoras enfrentam na geração de meios de subsistência para melhorar a coleta e a reciclagem de resíduos domésticos, particularmente em assentamentos informais, nas cidades do Sul global. Procuramos mapear a governança de resíduos sólidos e as iniciativas bem-sucedidas de gestão de resíduos, arranjos e políticas que envolvem iniciativas de base. Neste relatório, apresentamos uma breve descrição da governança de resíduos sólidos nas cidades onde realizamos o trabalho de campo. Em seguida, iluminamos algumas de nossas descobertas sobre inovações de base envolvendo catadores de materiais recicláveis ou trabalhadores de resíduos nessas cidades. Ambos os projetos de pesquisa combinam estudos de casos múltiplos de grupos de catadores e iniciativas do governo local, aplicam ferramentas de pesquisa qualitativa e pesquisa de ação participativa (por exemplo, foto-voz, observação participante, workshops, aplicação de questionários e entrevistas). Estamos interessados em entender processos, desafios e oportunidades relacionados a como essas iniciativas e redes de base operam para promover mudanças socioambientais e econômicas? Como eles abordam os desafios e quais são os ativos na governança diária de resíduos sólidos que podem ser explorados para tornar a governança de resíduos mais sustentável e, portanto, mais inclusiva? Pesquisadores envolvidos nestes dois projetos, atores de iniciativas de base nesses países (por ex. catadores), representantes de algumas redes internacionais de catadores e funcionários do governo local e regional de Kisumu, Quênia, se reuniram entre 23 e 29 de abril de 2018, em Kisumu, para apresentar e discutir os resultados do primeiro ano de atividades de pesquisa, que são aqui documentadas.

Dump pickers = waste pickers that reclaim and sell recyclables at the landfill or dump. They may live on the disposal site in improvised shacks or nearby.

Informal waste collectors = individuals who informally collect waste and take it to transfer points or the landfill

Middlemen, scrap dealers = buy recyclable materials from waste pickers and sell in larger quantities to the industry

Recyclers = another term for waste pickers, working only with recyclables.

Small scale recycling businesses = industries specializing in processing the waste materials (e.g. plastics) and selling them to big industries

Waste pickers = individuals that collect household or commercial/industrial waste. They may collect from private waste bins or dumpsters, along streets and waterways or on dumps and landfills. Some rummage in search of necessities; others collect and sell recyclables to middlemen or businesses. Some of them are organized into cooperatives or associations and work in recycling depots or classification plants owned by their groups. The term is widely adopted since the 1st World Conference of Waste Pickers in Bogota, Colombia in 2008 to facilitate global networking--and to supplant derogatory terms like “scavenger”. Other languages have their own preferred terms: *catadores* in Portuguese, *recicladores* in Spanish.

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1. INTRODUCTION

Millions of informal waste pickers collect, transport and process household and industrial waste daily in cities around the globe to earn a living. In so doing they make a significant contribution to reducing the carbon footprint of cities (da Silva Carvalho et al 2012[1], Mitlin, 2008[2], Wilson et al, 2008[3]), recovering resources, improving environmental conditions and health of low-income residents, and creating jobs and income among the poor. The activities of informal and organized waste pickers, youth groups and others thus represent citizens turning into socio-environmental entrepreneurs (Gutberlet et al., 2016[4]) through the co-production (Bovaird 2007[5]; Ostrom, 1996[6]) of basic waste collection and recycling services in informal and formal settlements.

Despite their numerous contributions, they represent one of the most widely excluded, impoverished and disempowered segments of society (Gutberlet, 2010). Waste pickers are exposed to toxic materials (Binion & Gutberlet, 2012[7]); suffer from widespread prejudice and stigmatization (Samson, 2009[8], Moreno-Sánchez & Maldonado, 2006[9]); are persecuted by police as waste picking is typically illegal (Zapata Campos & Zapata, 2013[10]); experience difficulties to create formal cooperatives or associations; lack access to official microfinance and funding opportunities; are susceptible to price market oscillations and are subject to exploitative relations with intermediaries (Tirado-Soto & Zamberlan, 2013[11]). All these difficulties lead to persistent poverty and at the same time to inconsistencies in waste collection services provided by this sector (Yates & Gutberlet, 2011[12]).

In response, informal waste entrepreneurs of the global South establish themselves in many different ways: as small groups, youth-groups, extended family groups, cooperatives or associations, unions,

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[1] da Silva Carvalho, M., Pinguelli Rosa, L., Luiz Bufoni, A. and Basto Oliveira, L. (2012) Putting solid householdwastetosustainableuse: a casestudy in the city of Rio de Janeiro, Brazil *Waste Management & Research,* 30 (12): 1312–1319.

[2] Mitlin, D. (2008) With and beyond the state — coproduction as a route to political influence, power and transformation for grassroots organizations, *Environment and Urbanization*, 20 (2): 339–360.

[3] Wilson, D. C, Araba, A. Chinwah, K. and Cheeseman, C. (2008), Building recycling rates through the informal sector, *Waste Management,* 29: 629–635.

[4] Gutberlet, J.; Kain, J.-H.; Nyakinda, B.; Oshieng, D. H.; Odhiambo, N.; Oloko, M.; Omolo, J.; Omondi, E.; Otieno, S.; Zapata, P. & Zapata Campos, M. J. (2016) Socio-environmental entrepreneurship and the provision of critical services in informal settlements. *Environment and Urbanization,* pp. 1-18. (Online First)doi:10.1177/0956247815623772.

[5] Bovaird, T. (2007) Beyond engagement and participation: user and community co-productionof public services, *Public Administration Review,* 67 (5): 846–860.

[6] Ostrom, E. (1996) Crossing the greatdivide: coproduction, synergy and development, *World Development,* 24 (6): 1073–1087.

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[8] Samson, M. (2009) Refusing to be Cast Aside: Waste Pickers Organising around the World. Women in Informal Employment: Globalizing and Organizing (WIEGO), Cambridge, MA, USA.

[9] Moreno-Sánchez, P. and Maldonado, J. H. (2006) Surviving from garbage: the role of informal waste-pickers in a dynamic model of solid-waste management in developing countries. *Environment and Development Economics*, pp 371-391.

[10] Zapata Campos, M. J. & Hall, M. (2013) *Organising Waste in the City: International Perspectives on Narratives and Practices*. Bristol: The Policy Press.

[11] Tirado-Soto, M. M. and Zamberlan, F. L. (2013) Networks of recyclable material waste-picker's cooperatives: An alternative for the solid waste management in the city of Rio de Janeiro, *Waste Management,* 33 (4):1004-12.

[12] Yates, J. S. & Gutberlet, J. (2011) Re-claiming and re-circulating urban natures: Integrated organic waste management in Diadema, Brazil. *Environment and Planning A*, 43:2109 – 2124.

networks micro-enterprises or other forms of community-based organizations (CBOs) (Tirado- Soto & Zamberlan, 2013[11]; Zapata Campos & Zapata, 2013b[13]). In most cases, organized waste pickers have received some form of financial support or technical advice from an NGO, a university, or the local government (Gutberlet et al., 2016[4]). Yet one of the most significant challenges is how to continue with their operations once the projects or funds that initially supported them have dried up. It can also take decades for an innovative solution developed by some of these waste picker organizations to be scaled up to other parts of the city or other locations (Hardoy et al., 2001[14]). Furthermore, it is often harder for waste picker organizations to achieve self-management through 'induced networks' and public-private partnerships (Tirado Soto & Zamberlan, 2013[11]).

The well-functioning of these initiatives also rests on the support from municipalities and eventually NGOs for the access of warehouses, equipment, professional training and the publicizing of their work in the city (Tirado-Soto & Zamberlan, 2013[11]). Particularly for informal waste collectors, it is very important to have official and controlled waste transfer points where the waste they collect from households is stored until the municipality evacuates it to landfills or to recycling centers (Gutberlet, et al., 2017[15]; Zapata Campos & Zapata, 2013a[16]). Access to public space is important, however, local governments often don't support their initiatives and remain suspicious, often refusing to admit or acknowledge the role of waste pickers. Waste picker networks around the world habitually struggle with municipalities that do not fulfil signed agreements (Yates & Gutberlet, 2011; Zapata Campos & Zapata, 2013a[15]; Furedy, 1992[17]).

Governmental arrangements created for the co-production of waste collection services (e.g. agreements for the remuneration of waste pickers, for regular evacuations of transfer points or licenses to operate waste collection) therefore calls for regular and long-term relationships where network and partnership arrangements are integrated in governance structures (Joshi & Moore, 2004[18]; Gutberlet, et al., 2016[4]). Still, many of these neighbourhood networks have expanded from community to city-wide (Boonyabancha & Kerr, 2015[19]) and regional scales. Waste picker social movements have been established over the past decades to represent the category of waste pickers in several countries; e.g. the *Excluded Workers Movement* in Buenos Aires, the *National Waste Pickers Movement (MNCR)* in Brazil, or the *Latin American Waste Pickers Network* - LAWPN. In some regions organized waste pickers have established networks (bringing together several waste picker cooperatives or associations) for collective operations, including commercialization and negotiations among waste picker cooperatives (e.g. *Rede Catasampa, Coopcent-ABC* or *Rede Verde Sustentável* in the metropolitan region of São Paulo, Brazil). These grass root initiatives and networks have turned into new social movements of the urban poor that, intentionally or not, challenge the nature of the state,

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[13] Zapata Campos, M. J. & Zapata, P. (2013b) Translating Aid Development into City Management Practice. *Public Administration and Development*, 33 (2) 85–160.

[14] Hardoy, J. E.; Mitlin, D. and Satterthwaite D. (2001) *Environmental Problems in an Urbanizing World: Finding Solutions for Cities in Africa, Asia and Latin America*, Earthscan Publications, London, 448 pages.

[15] Gutberlet, J., Kain, J.-H., Nyakinya, B., Oloko, M., Zapata, P., & Zapata Campos, M. J. (2017). Bridging Weak Links of Solid Waste Management in Informal Settlements. *The Journal of Environment & Development*. 26 (1): 106-131. http://doi.org/10.1177/1070496516672263

[16] Zapata Campos, M. J. & Zapata, P. (2013a) Switching Managua on! Connecting informal settlements to the city through household waste collection *Environment and Urbanization,* 25: 225-242.

[17] Furedy, C. (1992), 'Garbage: exploring non-conventional_options_in_Asian_cities', *Environment and Urbanization,* 4 (2): 42–61.

[18] Joshi, A and Moore, M. (2004) Institutionalized co-production: unorthodox public service delivery in challengingenvironments, *The Journal of Development Studies,* 40 (4): 31–49.

[19] Boonyabancha, S. and Kerr, T. (2015) How urban poor community leaders define and measure poverty, *Environment and Urbanization*, 27 (2): 637-656.

local governments and civil society (Mitlin 2008[2]; Gutberlet, 2010[20]; Zapata Campos & Zapata, 2012[21]). Unlike the standardized knowledge generated by donors and international organizations through 'best practices', easy to pack and 'sell' but difficult to replicate successfully to other contexts (Gutberlet et al., 2017[15]), these South-to-South bottom-up networks bring in locally developed, innovative and flexible solutions, and also learnings from their failures. Nevertheless, the topic of such joint global knowledge production, dissemination and upscaling remains largely un-researched.

It is in this context that the Recycling Networks & Waste Governance partner research project, aims at examining the challenges that innovative grassroots initiatives and waste pickers networks encounter and the livelihood practices they generate, to improve resource recovery, recycling and waste management through grass root initiatives such as cooperatives, associations, community-based organizations, public-private partnerships and networks. What are the characteristics of waste picker organizations and networks? What challenges and opportunities do they face? How can their grassroots innovations be shared? And, what is the role of waste picker networks and other supportive organizations such as international organizations as WIEGO or Universities in the co-production of this knowledge?

These questions are the starting point for the two projects that bring together practitioners and scholars from Argentina, Brazil, Canada, Kenya, Nicaragua, Sweden and Tanzania. The project's methodology is inspired by participatory action research through a combination of multiple case studies on waste picker initiatives in Managua (Nicaragua), Dar es Salaam (Tanzania), Buenos Aires (Argentina), metropolitan region of São Paulo (Brazil), Kisumu (Kenya) and Vancouver/Montreal (Canada) based on (a) interviews, observations, workshops, participatory video and document analysis (b) joint knowledge co- production with regional and global waste picker networks performing as knowledge hubs for the project, and (c) in-depth case studies and interventions in the cities mentioned before.

The present report is informed by the preliminary mapping and description of waste picker organizations, their waste governance situation and the grassroots innovations developed in these cities, based on a survey (n=100) and in-depth interviews (n=42) with a selection of these organizations from the project area.

This report presents outcomes of the first phase of the joined *Recycling Networks & Waste Governance* research projects. We will begin Chapter Two with a short description of our research methodology and then summarize key findings on the characterization of waste picker organizations and identified grassroots innovations based on our survey application. Chapter three introduces key aspects of waste governance in the countries and regions under study, with specific attention to the situation of waste picker organizations. In Chapter four we present selected grassroots innovations by country. Finally, in Chapter five we conclude with summarizing the key findings presented in the report, with a special focus on challenges, suggestions and ways forward to support grassroots innovations for inclusive waste management.

[20] Gutberlet, J. (2010) Waste, poverty and recycling. *Waste Management*, 30 (2): 171-173.

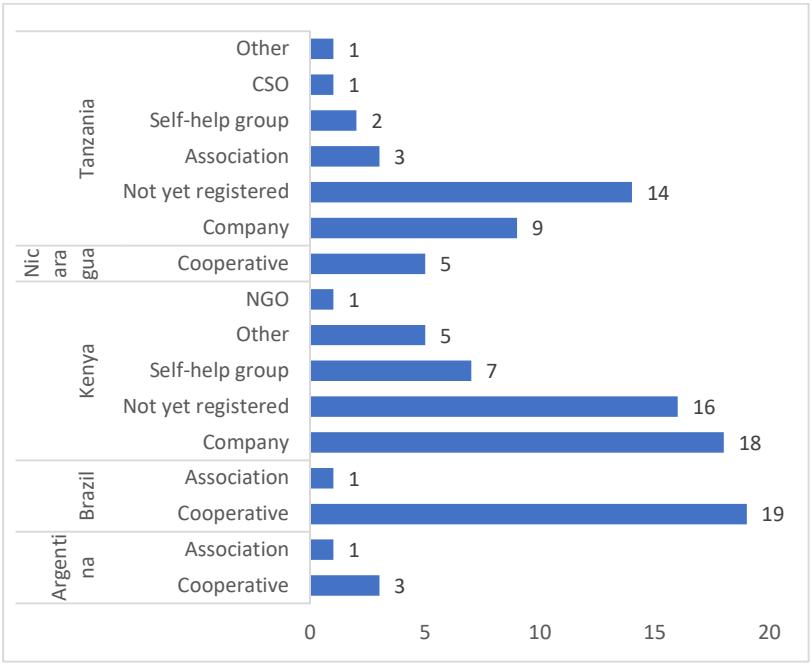
[21] Zapata Campos, M. J. & Zapata, P. (2012) Changing La Chureca: organizing city resilience through action nets, Journal of Change Management, 12 (3): 323–337

2 RESEARCH METHODOLOGY INCLUSIVE WASTE GOVERNANCE AND GRASSROOTS INNOVATIONS

Recycling Networks is a research project that examines the challenges that innovative grassroots initiatives and networks encounter in generating livelihoods to improve household waste collection and recycling in informal settlements of global South cities. *Waste Governance* maps the diverse facets of urban waste governance, including management approaches, initiatives, arrangements and policies. The research is conducted in partnership with universities and non-governmental initiatives from the respective cities under study: Managua, Dar es Salaam, Buenos Aires, São Paulo, Kisumu and Vancouver and Montreal. In 2017, a survey was conducted with waste picker / waste collector organizations in these cities, identified by each partner.

The survey covered 28 questions on history and characterization of the initiative in terms of its governance structure, funding and equipment situation, type of work conducted, characteristics of the workers, working conditions, network relations, challenges and innovations. The survey was applied in person by the researchers from the respective countries to a varied number and different of waste picker organizations (see Fig. 1). The resulting data was compiled into a unified spreadsheet for analysis. The following section summarizes some of the key survey results.

Figure 1: Number of initiatives involved in the survey application



Waste picker organizations were created as a result of economic and social triggering events in their institutional environments such as the unemployment characteristic of many informal settlements in combination with school drop-outs (e.g. Tanzania), and economic crisis (e.g. Argentina, Brazil) where waste picking is rendered as an opportunity for a livelihood. The struggle against different forms of insecurity can also be a driver for the creation of waste picker organizations. There are different types of waste picker organizations, particularly in the Latin American context we find membership based

organizations, including associations, cooperatives, networks and national movements. In some cases, in the African context, we also find small-scale social and or environmental entrepreneurs and diverse forms of self-help groups. For example, post-election violence in Kenya (2007-2008) as well as high crime rates in Kenya's informal settlements prompted the creation of self-help groups that later developed into waste picker organizations. Police persecution was also the triggering factor for the creation of some cooperatives in Argentina and Nicaragua by informal waste pickers. In other cases, mostly Kenya but also Tanzania, the creation of self-help groups for other purposes such as community banking/saving or youth groups, later developed into the provision of waste collection services as an economic activity conducted by the group.

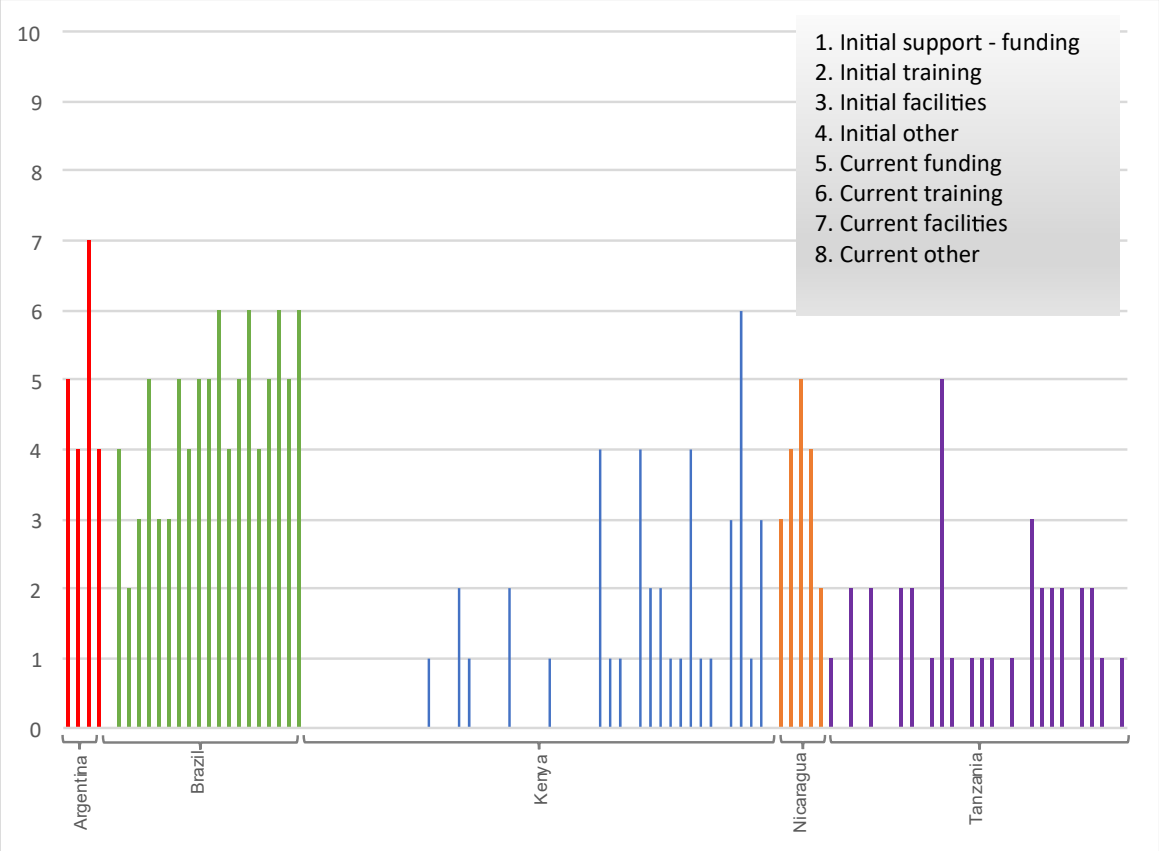
While economic and security needs usually come first, social and environmental rationales (such as their contribution to a cleaner and healthier environment, the development of services in deprived neighborhoods making cities more inclusive, and their roles as environmental stewards and agents of change) are often developed in parallel and intertwined with basic material rationales.

Similarly, changes in legal frameworks, as a result of the advocacy of waste picker and environmental networks in the case of Brazil and Argentina, can also open up windows of opportunities for economic diversification and the strengthening of these organizations. Such is the case of new environmental regulations in the Buenos Aires metropolitan region whereby large waste producers are entitled to take responsibility of their waste and waste picker cooperatives are encouraged to collaborate with waste producers to process waste fractions and reduce final disposal. The Brazilian national waste management legislation opened the possibility for organized waste pickers to become official service providers, remunerated for the selective waste collection. Reverse logistics policies forcing companies to demonstrate the destination of their residues, are pushing for increased recycling rates, creating opportunities for waste picker cooperatives in Brazil and Argentina. Finally, global macro discourses, such as the solidarity economy movement, materialized through policies and crystalized in public administration structures, as the creation of the Solidarity Economy Secretariat in Brazil, have also resulted in the availability of funding to strengthening these organizations.

In these situations, either of crisis or openings in the legislation, waste picking as a livelihood becomes an opportunity. The idea of self-organization into waste picker groups might come from different backgrounds, support by diverse motivations: relatives and friends that are already waste picking (e.g. Nicaragua, Brazil), local waste programs (e.g. Kenya), waste picker networks (e.g. Brazil), from incubators (often linked to universities), from catholic volunteer groups, learning through environmental and social NGOs, study visits or mentorship practices between small groups (as in the case of Kisumu's Youth groups). Despite these efforts most waste pickers in these countries still work individually. It is estimated that in Brazil, where the organization of waste pickers is more advanced, only 10% of the waste pickers are affiliated to cooperatives or associations (IPEA, 2013).

The initial resources to start up these waste picker organizations vary from country to country. Often pooling own resources and savings are involved, but also articulating collective and crowd funding strategies (e.g. in order to convince relatives to help them with first investments as in the case of youth groups in Kenya), involving table banking (e.g. Tanzania, Kenya) and donations from NGOs (e.g. Nicaragua, Kenya) as well as some governmental subsidies (e.g. Brazil and Argentina). The role of NGOs, development aid organizations, civil society organizations and supportive networks is also important in boosting these groups, particularly in their origins, connecting them to public authorities, and in some cases assisting them in the conformation of waste picker organizations with initial funding, training or facilities (see Fig. 2). The risk being, however, that once resources dry out waste picker organizations can fade away if they are not anchored to actors in the territory (local governments, local social movements, etc.).

Figure 2: Number of support actions for the initiative*

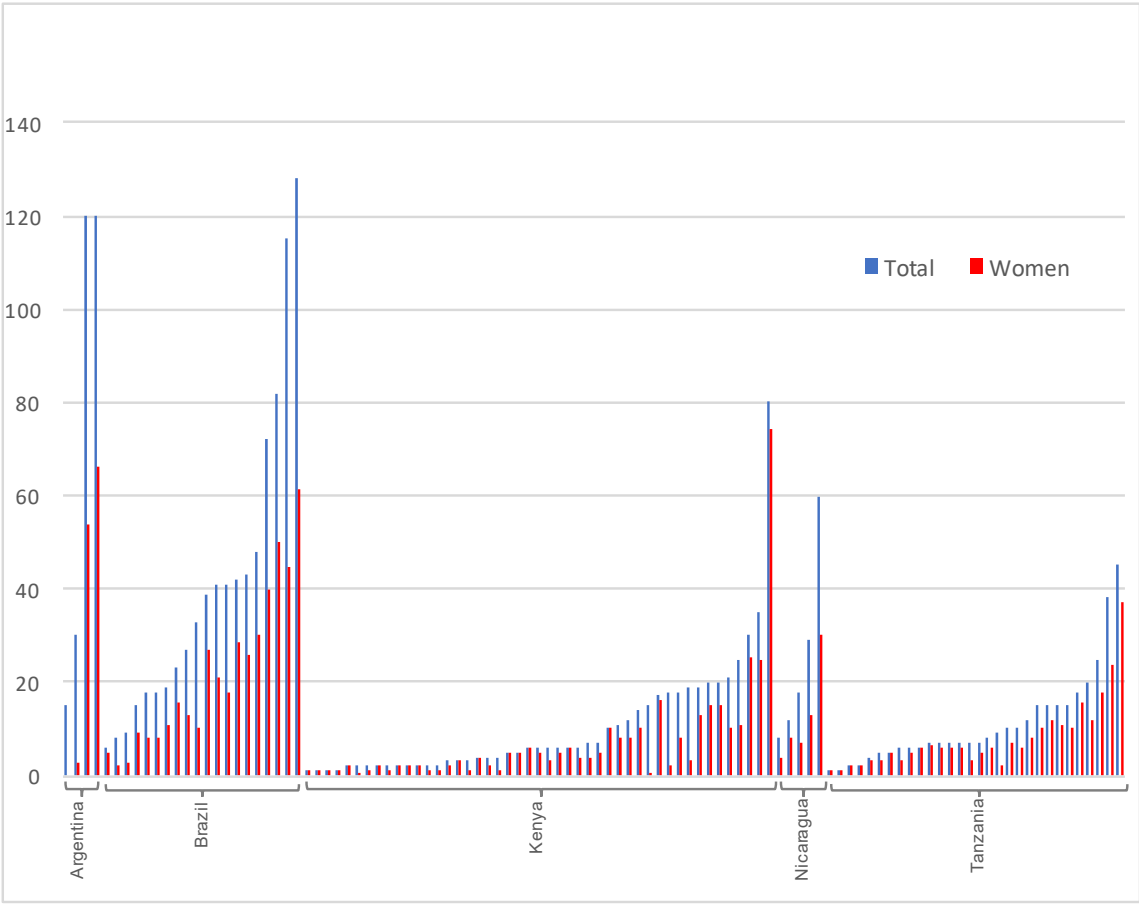


* Each line represents the response of one waste picker organization in the respective country.

The organizational form in which these waste picker initiatives crystalize also differs among regions. The cooperative model is predominant for most of Latin American waste picker organizations, which dates back to the historical pathway of cooperativism in this region. Kenyan and Tanzanian waste picker initiatives often adopt the form of self-help groups and community based organizations, together with small entrepreneurs and associations of entrepreneurs, which is linked to the predominant structure for self-organization of civil society in many African informal settlements. Nevertheless, the number of waste picker organizations that is not registered yet is quite high predominantly in the African cities.

In their initial stages, building up trust among customers (household, companies or public authorities), for example through meetings or showing the quality and the benefits of their work through community clean-ups is fundamental. This need for gaining legitimacy also extends to suppliers from whom they buy and sale, as well as potential waste pickers who might become members. Interestingly, throughout the different countries and experiences, a significant number of the participants in the waste picker organizations interviewed were women (45%). Particularly in the cooperatives in Brazil and Argentina often most of the members are women (Fig. 3). In all countries except Argentina women are the leaders in the cooperatives.

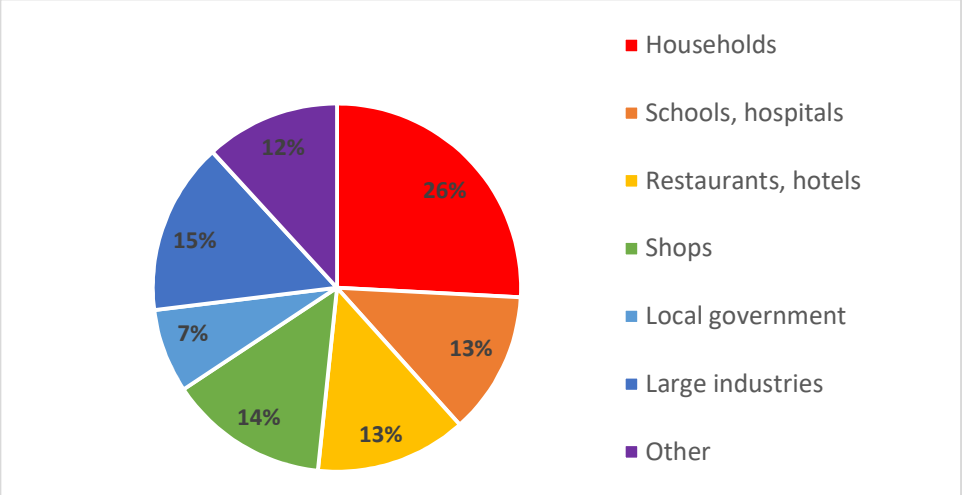
Figure 3: Number and gender composition of participants in the initiative*



* Each line represents the response of one waste picker groups interviewed by the project.

The services provided by these organizations are mainly collection of household waste and recyclables, buying and selling, sorting, and processing to a lesser extent. While the initiatives from Brazil and Argentina have developed a wider portfolio of services (door to door collection of recyclable household waste; collection of specific industrial waste) and products (e.g. new industrial supply of polystyrene pellets in Argentina, production of plastic into polymers, cooking oil recovery in Brazil), the waste picker organizations in Kenya, Tanzania and Nicaragua have not gone through such process of diversification. Supported by more progressive legislation during the past governments, a limited number of waste picker initiatives in Brazil and Argentina are remunerated by local governments for their environmental services. However, this advance has been reverted since 2017, due to political changes in these countries. In all cases, access to large waste producers and industrial waste (which is more homogeneous and produced in larger volumes) opens up for more lucrative recycling activities in comparison with solely relying on household waste collection. Waste picker organizations have many different clients (Fig. 4).

Figure 4: Types of clients in all countries



However, in countries like Brazil, the reverse logistics legislation has also opened up new opportunities for small to large scale companies to invest in the recycling business. Particularly the waste picker organizations in the metropolitan region of Sao Paulo have noticed an increased competition for recyclable materials from large generators.

3. WASTE GOVERNANCE AND THE ROLE OF WASTE PICKER ORGANIZATIONS

This section summarizes a description of the current waste governance situation in each of the countries and regions studied, with specific focus on the role of waste picker organization in waste management. The information presented here is based primarily on document searches and analysis, complemented with interview data. Not all of the existing networks, political and social arenas could be considered in this preliminary study, thus limiting our understanding of how power dynamics take shape and are manifested.

Each profile begins by defining the current institutional context, providing information about the historical development and the current national and municipal situation of waste management policies and key stakeholders involved in waste governance. We then describe how and when waste picker organizations have started to organize. A description of the different forms of waste picker initiatives that prevail in each country follows with addressing gender income, level of resource recovery and information on external funding and support, if available (e.g. the existence of contracts with local governments, etc.).

Each profile also comments on the difficulties and challenges that are still prominent, such as e.g. impacts due to privatisation and mechanization of recycling facilities, financial vulnerability, lack of local government collaboration, etc. Then we want to highlight the existing achievements of these initiatives as well as present expected future interventions.

3.1 WASTE GOVERNANCE IN THE METROPOLITAN REGION OF BUENOS AIRES, ARGENTINA

3.1.1 INSTITUTIONAL CONTEXT

The Buenos Aires metropolitan area is a vast urban agglomeration formed by the City of Buenos Aires (BA), which is an autonomous jurisdiction, and the 24 Municipalities that are located in its surroundings, which depends on the Province of Buenos Aires administration. This territory of 3,833 km^2, concentrates more than 15 million inhabitants, and has an average production of 17,000 tons of waste per day. According to unofficial data, around 15% of that amount of waste is recovered daily, due to the work approximately 25,000 waste pickers of which 15% is organized into officially recognized cooperatives.

As the metropolitan area encompasses a huge and complex territory, we must differentiate the institutional context for the City and the Municipalities located within the Province of Buenos Aires. For example, most of the more than 40 cooperatives that bring together the metropolitan waste pickers, are located within this provincial municipalities, however almost 50% of the waste pickers population works within the BA City`s boundaries, as it concentrates more and better quality recyclables. In this sense, the institutional framework in force at the metropolitan level presents a strong influence of what happens at the level of the City of Buenos Aires.

Here, the collection of recyclables was organized as a differentiated circuit, which recognizes twelve collection zones within the city. Each zone was subject to public bidding in favour of some of the cooperatives that had been operating historically in that area. As a result, twelve waste picker cooperatives have formalized a contract with the City government, in order to provide the recyclables collection and sorting service in each zone. The government lends working facilities (coaches, trucks, sheds and uniforms) to each cooperative, which remains as a municipality property. They also pay to each member a 'complementary income', which in average represents a third of its total income approximately.

This complementary income is important for each member as an income, however, we cannot consider it a proper payment in terms of remunerating the 'public service' they are providing, as it does not address the overall cooperative expenditures. Therefore, then the sustainability of the cooperative still depends on their ability to sort and sell recyclables. Nevertheless, it represents a key achievement which is directly derived from the long-standing struggles of this population.

In contrast, the situation of the cooperatives which are working within the provincial municipalities, is far more precarious. Only a few are negotiating similar agreements with their local municipalities, but they only receive the provision of working means and facilities, excluding any kind of payment. Hence, most of those cooperatives must survive of the weekly sales of materials collected without any, or little, state support. However, an interesting opportunity was launched at the end of 2013 when the Provincial Agency for Sustainable Development (OPDS) convened the cooperatives to work on a new regulation for Large Generators (LG: Industrial or commercial buildings that produces more than 1 ton/day of waste). Resolutions 137-138 and 139 enable cooperatives that register in the OPDS to offer specialized services for the management of recyclable waste for LG, being paid by the companies for this service. In turn, cooperatives are authorized to issue official certificates, equal to the private companies that offer the same services. This is key if we consider that the LG require this certification to accredit ISO standards and receive a social license. Through these agreements, cooperatives have access to clean and valuable recyclables, which require a minimum sorting before being commercialized, which in turn, translates into a relatively stable source of income.

Another issue to highlight regarding the institutional context has to do with the existence of other stakeholders involved in these processes. At the beginning of the contemporary 'cartonero' (waste picker) phenomena (2000-2006), NGOs such as Greenpeace, AVINA or COSPE played an important role in relation to the provision of technical and financial support to the first cooperatives of waste pickers. They had settled themselves as the key intermediators in the relation between cooperatives and the governmental agencies. However, as these coops were strengthened, the links with NGOs were weakened to give rise to a closer relationship with social movements and political organizations that had a strong presence in the territories where they were located. Thus, as of 2007, the formation of second-degree organizations, closely related to a larger political fabric and of great presence in the territories, becomes relevant. On one hand, the National Network of Waste Pickers and Recyclers linked to the Confederación Nacional de Cooperativas de Trabajo (CNCT) (National Confederation of Labour Cooperatives), brings together up to 20 cooperatives nationwide. On the other hand, the Federación Argentina de Cartoneros, Carreros y Recicladores (FACCyR) (Argentinian Federation of waste pickers, waste pickers with horse pushed carts and recyclers) conformed by more than 40 cooperatives throughout the country and linked to the Confederación de Trabajadores de la Economia Popular (CTEP) (Confederation of Workers of the Popular Economy). The FACCyR experimented a fast-growing process in the last years, due to the impulse given by a political organization called Excluded Workers Movement (MTE) (Movimiento de Trabajadores Excluidos) which have developed social inclusion and local development activities within the marginal neighbourhoods were most of the waste pickers live. As an example, the MTE have been key in building the agreement and public bidding between waste pickers and the BA City government referred earlier.

Finally, in relation to the legal framework, it must be highlighted that due to the waste pickers' organization and struggles, they gained recognition within norms and laws related to integrated waste management, as for example the 992/02, 1845/05 and 4120/11 in BA City, or the 13.592/06 and the OPDS regulations within the Province of Buenos Aires. Without any doubt, this was a milestone that fostered its social inclusion and integration into the metropolitan waste management system. However, they are currently facing major challenges, basically related to the weakening of its relation with the governmental authorities due to the lobby held by foreign Waste to Energy (WtoE) technologies enterprises, which aim to sell plants to the local governments. They now have the support from the current BA City government, which has been able to reform the iconic 1845 law (known as 'Zero Waste'), in order to make room for incineration as a strategy to manage waste, something that before was explicitly banned in the law`s original text.

3.1.2 CREATION OF WASTE PICKER ORGANIZATIONS

The creation of the current waste pickers organizations in Buenos Aires is closely related with two milestones in the recent history of the country, that also have modelled our social relation with waste.

Firstly, during the 1976 civic-military dictatorship a major transformation of the waste management system occurred. Previously each municipal jurisdiction had autonomy to manage their own waste collection and disposal system. But then, the government centralized the system by creating a public-private joint venture called CEAMSE (Coordinación Ecológica Área Metropolitana Sociedad del Estado), which have introduced the landfill technology, constructing five complex within the metropolitan area. Since then, each municipality was compelled to dump its waste in landfills, and to contract private firms to supply them with the urban collection and transportation services. There were two main consequences of this transformation. On the one hand, the privatization of the collecting and transportation to the landfill represented a major cost for the municipalities budgets. Currently this cost represents the 1 to 5 top rank of expenditures within their treasures, far exceeding the budget allocated to health or education. Second, it changed the legal condition of waste, as it began to be considered as a 'private property'. Since the moment in which each citizen laid down its garbage over the sidewalk, it is considered as a municipality`s property (and by extension to the private collection companies hired by the local governments). In this way, the collection of materials from the garbage street bins began to be considered theft, and therefore waste pickers suffered repression and police harassments. This brings us to our second moment.

Due to the deep deterioration of the living conditions during the socio-economic crisis of 2001, large populations of the poor began to search for recyclables in waste as a way to make a living. Since they basically looked for cardboard (cartón), they began to be known as 'cartoneros' (waste pickers collecting cardboard). Since they were a new (and unwanted) actor within the urban environment, the first reactions of the authorities focused on repression and expulsion, but the scale of the phenomena (it is estimated that they reached a population of 250,000) and its direct relation with the deterioration of the social fabric due to the crisis, also gave raise to signs of social solidarity and support to their work. In this context, the first cooperatives were formed in 2002 and 2003, which played a key role in contesting repression and demanding specific policies for the sector. At that time, and in accordance with the implementation of the GIRSU paradigm promoted by international multilateral agencies in the region, the first government programs and laws were launched, partially addressing some of the waste pickers demands as we have pointed out before.

3.1.3 DESCRIPTION OF THE INITIATIVES

All initiatives adopt the legal form of a cooperative, which brings together about 30 members on average. Although, those cooperatives working within the BA City are bigger (e.g. the 'Amanecer de los Cartoneros' Cooperative gathers up to 1500 members) as they profit from the financial aid provided by the government administration. The vast majority have larger numbers of males than females (80%/20%), including some cases where women are the majority and reach leadership positions.

These cooperatives gather a very heterogeneous population, whose common denominator is the experience of unemployment and the degradation of their living conditions. Thus, those who became waste pickers could include from former factory workers, single mothers who were breadwinners, to young people who never have had entered the formal work force.

Most of the cooperatives combine household collection of recyclables with the provision of waste management services to LG. The average monthly income per person ranges between 350 US$ to 580 US$, showing high variability according to market prices that are heavily influenced by the seasonality and the stock capacity of the buyers.

In relation to external funding and support, it should be noted that, in general, they lack systematic and specific support for their activities, with the exception of the aforementioned twelve cooperatives contracted by the City of Buenos Aires. Other funding opportunities are not oriented towards waste pickers but to promote cooperatives in general, as the ones benefited from the autonomous Work Program of the National Ministry of Labour, where each member received 173 US$. This type of subsidy is usually negotiated through the Federations and has a variable duration between one and three years. Finally, a third income source comes from social policies oriented to the family, such as the 'Asignación Universal por Hijo' (Universal Income for Children) (70 US$ per child), a type of citizen income that requires vaccination and schooling of children as consideration.

3.1.4 DIFFICULTIES/CHALLENGES

One big challenge is related to the market-driven oriented recyclable management system. As the government refused to fully recognize the cooperatives as providers of a public service, they must generate its incomes from the sorting and selling of the recyclables that they collect. However, the government recognizes as public service the street collection conducted by private firms that transport household waste to the landfills. This paradox generates a perverse effect, as most of the cooperatives then focus their efforts on those recyclables that have a better market price (cardboard, PET and paper). In consequence many other materials, such as polystyrene containers are discarded again even when they could be recycled, as the price obtained does not justify the collection and conditioning work required. Thus, a major challenge is to open this economic rationality, by strengthening the repertoire of social and environmental arguments that justify the treatment of the differentiated recollection of recyclables as a public service and not as a mere market niche.

Another challenge is related with the promotion of WtoE models, which as mentioned before, are now being encouraged by the government of the city of Buenos Aires. In this case, a shift to WtoE would directly mean the dismantling of the agreements reached with the cooperatives to be integrated into the waste management system. In relation to the waste picker sector more broadly, it would make room for a technology that not only has a high risk to human health and the environment, but also competes

directly with the waste pickers. In one case, the recyclables are recovered to reuse and recycle, while in the other they are used to feed the incinerator.

3.1.5 ACHIEVEMENTS

Even without spreading yet to other jurisdictions, the process of integration of waste picker cooperatives within the BA City waste management system, represents a key achievement, as evidences that the cooperatives have the necessary skills and knowledge to run a differentiated collection service, involving dense populated areas in complex urban agglomerations. In this sense, the cooperatives located at the BA province are working to generate associated regulations at the municipal level, which replicates what the OPDS regulations stipulates at a provincial level. They are also lobbying with local municipalities, business chambers and private industries and commercial firms in order to promote new contracts with the cooperatives. In sum, they are developing a new waste management model, introducing principles of territorial ordering, circular economy and sustainable development, from the perspective of waste picker organizations.

Another achievement is related to what we call 'verticalization' of their productive processes, this is to move forward the industrialization of recyclables collected by them. This is important because it avoids concentrating their work solely in practices of collection and sorting of household waste. In this way, not only more added value is achieved with the product itself, since a better price is obtained compared to 'raw' sales, but also new subjectivities are strengthened among the waste pickers, valuing their skills for development of design and transformation practices, beyond the collection and classification.

3.1.6 FUTURE INTERVENTIONS

The future actions have to do with strengthening the role of the waste picker sector as service providers (public and private) as a way to avoid the entrepreneurial models in which they are currently framed. Some of these actions include:

Develop a campaign against WtoE at the level of public opinion and valuing the socio-environmental contribution of the waste pickers. In this way, the campaign is an opportunity to strengthen the demand for recognition as a public service at the level of public opinion.

Advance with advocacy work at the level of Municipalities. The objective is to achieve ordinances that take back the resolutions of the OPDS, to strengthen its implementation in each territory. Municipalities could thus better articulate with LG and cooperatives in their territories, in order to promote the establishment of contracts for the provision of specialized services in the field of recycling management.

Foster strategies for the verticalization of their production processes, including the development of an industrialization model that reuses the collected materials, avoiding their recognition as collectors and sorters of recyclables only.

3.2 WASTE GOVERNANCE IN THE METROPOLITAN REGIONS IN BRAZIL

3.2.1 INSTITUTIONAL CONTEXT

Waste management policy (WMP) in Brazilian municipalities has its guidelines formulated by the federal level and to a lesser degree by the states. Municipalities are responsible for implementing the WMP, according to federal regulations for inclusive waste management (Tab. 1).

Table 1: Main federal waste management regulations, Brazil, 2002-2018

Regulation	Content
Ministry of Labor Ordinance 397/2002	Establishes the new *Brazilian Labour Classification,* including the profession of waste pickers.
Presidential Decree September 11.2003	Creates the *Inter-ministerial Committee for Social Inclusion of Waste Pickers.*
Law Nr. 11.107/2005	Regulates formation of *Inter-municipality Consortia* including waste management
Presidential Decree 5.940/2006	Stipulates that recyclables generated in public federal institutions should be sent to waste picker organizations.
Law 11.445/2007 National Law for Basic Sanitation	Defines urban solid waste and public services for management. Authorizes waste picker cooperatives to be contracted by municipalities with no competitive bidding.
Law 12.305/2010 National Policy for Solid Waste	Creates standards and criteria for the elaboration of waste management regulations on states and municipalities, that should elaborate *Integrated Waste Management Plans*, with social participation and control and promoting inclusion of waste picker organziations.[22] Creates sectoral agreements to stimulate recycling in specific sectors/ industries considered big waste generators.
Decree 7.405/2010	Creates *Pró-catador Program* and *Inter-Ministry Committee for Social and Economic Inclusion of Waste Pickers*.
Decree 7.619/2011	Establishes tax exemptions for purchasers of recyclables raw materials from waste picker cooperatives.

Sources: Ministério do Trabalho e Emprego (2002) Portaria nº 397, de 09 de outubro de 2002. Aprova a Classificação Brasileira de Ocupações - CBO/2002, para uso em todo território nacional e autoriza a sua publicação; BRASIL. Decreto de 11 De Setembro de 2003. Cria o Comitê Interministerial da Inclusão Social de Catadores de Lixo.; BRASIL. Lei Nº 11.107, DE 6 De Abril de 2005. Dispõe sobre normas gerais de contratação de consórcios públicos e dá outras providências; BRASIL. Política Nacional de Saneamento Básico. Lei 11.445, de 05 de janeiro de 2007; BRASIL a. Política Nacional de Resíduos Sólidos. Lei 12.305, de 02 de Agosto de

[22] 2009 National Budget Guidelines Law authorizes direct transfers of public financial resources to recycling activities performed by waste picker associations/cooperatives.

2010. 2010; BRASIL b. Decreto nº 7.405-2010- Pró-catador – Institui o Programa Pró-catador. 2010; BRASIL. Decreto Nº 7.619, DE 21 DE NOVEMBRO DE 2011. Regulamenta a concessão de crédito presumido do Imposto sobre Produtos Industrializados - IPI na aquisição de resíduos sólidos.

Municipalities, cooperatives and other public/private actors are expected to improve their WMP according to the stimuli and constraints designed to achieve policy goals. Nevertheless, some indicators show a slow pace of transformation in waste management practices, combined to increased waste generation, from 2008 to 2016 (Tab. 2).

Table 2: Waste management indicators, Brazil, 2008-2016

Indicator	**2008**	**2016**	**Variation 2008-2016**
Solid urban waste generation (million/tons)	52,9	78,3	48,02
Urban solid waste per capita (kg/inhabitant/year)	337	379,6	12,64
Urban solid waste collected (million/tons)	46,5	71,3	53,33
Urban solid waste sent to open dumps (ton/day)	37.612	33.948	-9,74
Urban solid waste sent to controlled dumps (ton/day)	29.887	47.315	58,31
Urban solid waste sent to landfills (ton/day)	81.710	114.189	39,75
Municipalities without selective waste collection initiatives	2.456	1.692	-31,11
Municipalities with selective waste collection initiatives	3.109	3.878	24,73
Municipalities with landfills	2.158	2.239	3,75
Municipalities with controlled dumps	1.749	1.772	1,32
Municipalities with open dumps	1.657	1.559	-5,91
Municipal budget for urban solid waste management per capita (millions US$/year)	1.829	2.883	57,63

Sources: ABRELPE (Associação Brasileira de Empresas de Limpeza Pública) (2008) *Panorama de Resíduos Sólidos no Brasil-2008*. São Paulo: Abrelpe. Website: http://www.abrelpe.org.br/Panorama/panorama2008.pdf; ABRELPE (Associação Brasileira de Empresas de Limpeza Pública) (2016) *Panorama de Resíduos Sólidos no Brasil-2016.* São Paulo: Abrelpe. Website: <http://www.abrelpe.org.br/Panorama/panorama2016.pdf

The Metropolitan Region of São Paulo (MRSP) is formed by 39 municipalities with a total of 21.2 million inhabitants. Data from the Ministry of Cities on urban waste management (Ministério das Cidades, 2016[23]) reveals the following indicators related to different dimensions of waste management in the MRSP (Tab. 3).

[23] Ministério das Cidades (2016) Diagnóstico do manejo de Resíduos Sólidos Urbanos. Brasilia: Ministério das Cidades. Website: http://www.snis.gov.br/diagnostico-residuos-solidos/diagnostico-rs-2016

Table 3: Waste governance/management practices/indicators for the MRSP, 2016*

Practices/indicators	Data
Institutions in charge of services	Municipalities (13) Secretariats (17) Independent public authorities (3) Not informed (6)
Formalized basic sanitation policy	Yes (20), No (10) Not informed (9)
Formalized urban waste management plan	Yes (24), No (6) Not informed (9)
Formalized Social Control/Participation (Council, collegial bodies)	Yes (13) No (3) Not informed (23)
Charging of services fees	Yes (14) No (19) Not informed (9)
Selective collection services	Yes (23) No (10) Door-to-ddor collection (22) Voluntary Delivery Points (8) Not informed (6)
Expenses on urban waste services (US$)	901 million (total), 27 million (average), 140,000 (minimum), 637 million (maximum) Not informed (6)
Total waste collected (tons)	6.5 million (total), 197,000 (average), 3,600 (minimum), 3.8 million (maximum) Not informed (6)
Total recovered material (tons)	35,900 (total), 1,560 (average), 5.5 (minimum), 7,290 million (maximum) Not informed (10)

Source: Ministério das Cidades (2016)

* The survey is based on consultations by the Ministry of Cities in all municipalities in Brazil, but not all of them respond (Not Informed)

3.2.2 CREATION OF WASTE PICKER ORGANIZATIONS

The waste pickers in Brazil first began to organize as cooperatives or associations in the late 1980s, particularly in the Southeast of the country. In 1998, the National Forum on Waste and Citizenship (*Fórum Nacional Lixo e Cidadania – FNLC*), was created by 19 non-governmental organizations and with the support of UNICEF. FNLC in itself was an innovation which got inspiration in another innovative formal partnership between municipalities (such as Belo Horizonte, Porto Alegre) and waste pickers associations and coopertives (see: Dias 2009[24]). The FNLC Forum was instrumental in bringing together a great variety of grassroots initiatives, social groups and institutions at various government levels, with the objective to address issue of waste, waste pickers and social, environmental and economic inclusion. Since then many regional and local fora on waste and citizenship were created to support the organization of waste pickers. At the same time a growing

[24] Dias, S. M. (2009) Trajetórias e Memórias dos Fóruns Lixo e Cidadania: Experimentos Singulares de Justiça Social e Governança Participativa. Programa de Pós-graduação em Ciência Política da Faculdade de Filosofia e Ciências Humanas da UFMG, Belo Horizonte (Doctoral Thesis).

national movement of waste pickers had emerged (*MNCR Movimento Nacional de Catadores de Materiais Recicláveis*). These initiatives brought the social and economic inclusion of the previously invisible informal recycling workers to the attention of the federal government and some states. In 2007, the Federal Government established a program, called CATAFORTE I, with a 4-year budget of around R$60 million (US$22.6 million) to support organized waste pickers. CATAFORTE was aimed to organize and create 35 networks, linking waste picker cooperatives and associations in 22 states with the purpose of expanding capacity building (Rutowski & Rutowski, 2015[25]). In 2010 CATAFORTE II, a second phase, was launched, to support the integration of recycling networks into public policies and to implement reverse logistics. In 2014, CATAFORTE III, aimed at the capacity building to transform the recycling cooperatives into service providers in selective waste collection, separation, reverse logistics and value adding to the production chain.

3.2.3 DESCRIPTION OF THE INITIATIVES

Most waste picker associations or cooperatives are part of the *Solidarity Economy Movement*, that helps organize groups through local solidarity economy organizations. A survey conducted by the Solidarity Economy Secretariat[26] between 2009 and 2012 mapped a significant part of the existing groups: 692 waste picker organizations characterized as solidarity economy enterprises, of which 80% were formed after 2001, with 21,164 workers (39% women), mostly concentrated in the South and Southeast, the richest regions in the country. 38% of these organizations were informal, 34% associations, 28% cooperatives, and 19% affiliated to commercialization networks. 53% of these organizations declared to own recycling equipment, and 39% work with rented equipment or granted by other institutions. 46% of the organizations commercialize material through intermediaries. 8% of the groups got some kind of funding in the year before the survey.

There is great disparity, unevenness and inequality in terms of level of organization, level of equipment and capacity, scale and range of operation between initiatives in different regions. There are many serious problems related to recycling in poorer regions. Table 4 presents some indicators showing the slow pace of transformation on waste management practices (Tab. 4).

Table 4: Socio-economic characterization of waste pickers (2010)*

Average age	39.4 years (2.1% under 18 years, 25.5% between 18 and 29, 48% between 30 and 49, 15.8% between 50 and 60, 6.5% older than 60 years)
Gender	68.9% male, 31.1% female
Race	66.1% black, 33.9% white
Number of population of waste pickers	398,348

[25] Rutowski, J.E. & Rutowski, E.W. (2015) Expanding worldwide urban solid waste recycling: The Brazilian social technology in waste pickers inclusion. *Waste Management & Research*, Vol. 33(12) 1084–1093.

[26] This Secretariat of Solidarity Economy has been extinct in November 2016.

Total population Brazil	190,732,694 (2010 IBGE census data) 210,870,000 (2018 estimate)
Average Income per day? Week?	US$ 168.88 (US$ 180.56 men, US$ 136.08 women; US$ 189.98 white, US$ 155.19 black)
Official monthly minimum wage (2018)	R$937.00 (US$287.89), which corresponds to R$4.26 per hour or R$31.23 per day
Formalized waste pickers	38.6% (2010 IBGE census data)
Gini index	0.42 (Brazilian workers average: 0.58)
Social security cover (population over 60 years)	57.8% (population in households with at least one waste picker). National average is 74.9%
% of waste pickers that pay social security contribution	15.4%
Illiteracy rate	20.5% (national average: 9.4%)
% of population older than 25 years with elementary education	24.6% (national average: 50.3%)
% of population older than 25 years with high school education	11.4% (national average: 35.9%)
Access of households with at least one waste picker to adequate sewage services	49.8% (national average: 66.7%)
Households with at least one waste picker with one or more computers	17.7% (national average: 39.3%)

* There are huge socio economic and livelihood disparities between Brazilian Regions

Source: IPEA (2013)

In most cases waste picker organization were created with the support of local government agents (e.g. social workers), NGOs (organizations to eradicate child labour, to support social inclusion and to promote citizenship), church groups (based on fraternity and paternalism), university projects (mostly through community based extension work, *extensão universitária*) or other groups (e.g. local business, international organizations, etc.). The main reason for creating a cooperative for waste pickers is related to social development and citizenship building, where a cooperative is seen as a space for human development and social inclusion.

There are large differences in income, availability of infrastructure and equipment and level of organization. While most waste pickers come from very poor backgrounds, with very little opportunities for education and professional development, some waste pickers have achieved significant personal and professional growth over the past decade due to development opportunities within the cooperative or association. Those cooperatives that are better off, have been able to access external funding, primarily government funding and support (CATAFORTE). The average income and level of resource recovery is based on their success in attracting funding and capacity building support.

As for the Metropolitan Region of São Paulo (MRSP) 39 municipalities, 20 municipalities informed the existence of one or more cooperatives in their waste management systems, 71 cooperatives in total

(Ministério das Cidades, 2016). These 71 cooperatives have 2,594 members, 36 on average. 16 municipalities informed the total collected by cooperatives in 2016, that amounted to 29,176 tons, corresponding to 0.48% of the total solid waste generated in these municipalities. However, this relatively small amount corresponded to around 75% of all recovered material.

3.2.4 DIFFICULTIES/CHALLENGES

Despite the many advances and successes that the organized waste pickers can celebrate in Brazil and in the MRSP, there are still many difficulties and challenges to overcome. Our research has identified four main areas that need special attention, according to the waste picker leaders that participated in the research.

- Difficulties in collecting and marketing recyclable materials (the influence of middlemen, companies and large generators; negotiating reverse logistics, eco-points and door to door collection within municipal selective waste collection programs).
- Lack of access to recyclable material and infrastructure, because recently not enough recyclable materials are being collected for separation in cooperatives (because large generators now often separate and sell recyclable materials, which previously they provided to waste pickers).
- Difficulties in self-management (introduce new leadership in the governance structure of cooperatives and networks, increase co-operative member participation in meetings, high turnover of coop workers).
- Support and dialogue with the Government (in hiring recycling cooperatives for selective waste collection and remuneration for the services they provide). Yet, waste pickers are underrepresented in government bodies created to support them, such as the Inter-ministerial Committee for Social Inclusion of Waste Pickers; and there is no updated information about support actions (the last Committee meeting available for public consultation was organised in 2015). New funding calls under the Pró-Catador Program have not been launched after 2014. Formulation of sectoral agreements are dominated by the interests of private companies. Waste pickers have little participation in negotiations. Finally, the directive that stipulates that recyclables generated in public federal institutions should be sent to waste picker organizations has not been fulfilled.

Many waste pickers mentioned that the availability of recyclable materials has dropped sharply and that often the groups do not have contracts with municipalities to guarantee the access to household waste. Some groups now work less hours, due to lack of material. WtoE is perceived by most waste pickers as opposition to inclusive waste management.

Many cooperatives do not have working capital, which makes it impossible to participate in collective commercialization and which thus keeps them tied to the prices paid by middlemen. It is still very difficult for recycling groups to enter the market of large generators. One of the reasons is that the credibility of the public in the work of waste pickers remains quite low. While in some municipalities the waste pickers have conquered the right to be paid for the services they provide, this unfortunately still remains an exception and for most waste pickers the non-remuneration of their service keeps them in poverty.

Despite the huge advances achieved in capacity expansion of many waste pickers there is still a widespread lack of preparation of many waste pickers for the management of the cooperative, which

hinders their development and often reduces their income. There are also many work space related issues with the recycling groups, sometimes generating inefficiencies, health risks and accidents.

3.2.5 ACHIEVEMENTS

The greatest achievement of the Brazilian waste pickers is their level of organization; in part, due to the National Recyclers' movement's (MNCR) support and in part due to the massive federal government backing provided towards the structuring, organizing, capacity building and political awareness building of waste pickers, during the past PT (Workers party under Lula and Dilma Rousseff) government and even before through the social mobilization promoted by the *Fórum Nacional Lixo e Cidadania* (FNLC). These favourable political conditions, over the past decade, have enabled many waste pickers to improve their quality of life and to organize.

The strong governmental support and the creation of specific favourable public policies and funding lines were instrumental for the creation and increase of organized groups and networks of waste pickers. According to official sources there were 398.348 waste pickers in Brazil in 2010 (Dagnaino & Johansen, 2017[27]). A 2010 estimate indicates that only 10% of the total waste pickers are affiliated to cooperatives or associations. In 2008, there were 1,175 waste picker cooperatives or associations, in 684 municipalities and a total of 30,390 organized waste pickers (IPEA, 2013)[28]. That means approximately 10% of the waste pickers are organized in Brazil. A total of 5% of waste pickers have been able to establish a contract with the municipality or the private sector and work under relatively good conditions with higher earnings (see Dias, 2011[29]).

With the inclusion of the waste picker profession into the Brazilian Classification of Occupations (CBO), statistical data is available on waste pickers, collected by the *Brazilian Institute of Geography and Statistics* (IBGE) through the National Research by Household Sample (PNAD) as well as by the Ministry of Labor and Employment collected for the the Annual Listing of Social Information (RAIS).

Many groups have achieved significant grassroots innovations in terms of internal governance, level of dialogue with other stakeholders, municipal service provision, added value and participation in the recyclable value chain. Many waste picker cooperatives and associations are organized in networks, facilitating collective commercialization and negotiation.

3.2.6 FUTURE INTERVENTIONS

[27] Dagnaino, R. de S. & Johansen, I.C. (2017) Os catadores no Brasil: Características demográficas e socioeconômicas dos coletores de material reciclável, classificadores de resíduos e varredores a partir do censo demográfico de 2010. *Mercado de trabalho*, 62, 115-125.

[28] IPEA (Instituto de Pesquisa Econômica Aplicada) (2013) Situação social das catadoras e dos catadores de material reciclável e reutilizável – Brasil. Brasilia: IPEA.

[29] Dias, S. M. (2011) Statistics on Waste Pickers in Brazil. *WIEGO Statistical Brief* No 2. May 2011.

Being able to access further capacity development and educational opportunities are among the key aspirations of the waste pickers that were involved in this research and the university is in a position to deliver these services. Access to knowledge for the waste pickers directly translates into opportunities to participate in the value chain of the recyclables, in service provision and environmental stewardship activism and service, as well as in developing and accessing new technologies and strategies to work with the 3Rs.

One of the steps recently discussed with waste pickers is the creation of a university for waste pickers, where knowledge is co-created and passed on by a combination of different professionals, including waste pickers. This also includes the inclusion of waste picker knowledge in the teaching at the university; as a way of discussing concrete social, economic, environmental and technical issues. The authors are engaged in the formulation of a project that aims at creating an outreach course for waste pickers, formulated in partnership with waste pickers from the MRSP.

3.3.1 INSTITUTIONAL CONTEXT

Worldwide, Canada is one of the countries that most produces solid waste, with 729 kg per person, in 2010 or approximately 2 kg per person/day (CCME, 2014) [30]. This is, for example, twice as much as the Japanese society generates every year. Currently, approximately 76% of the total MSW is either landfilled or incinerated and 24% are composted or recycled. Some regions have a long history of exporting household waste to the United States (as e.g. from Ontario to Michigan). Hence it is no surprise that Canada should be looking into waste avoidance, waste reduction and alternative waste management strategies.

Municipal solid waste (MSW) is regulated by the provinces and territories and managed by the waste management industry under contract to municipal or regional authorities, or managed by municipal authorities directly. The definition of MSW includes small amounts of hazardous and special wastes commonly found in the residential and ICI sectors (Industrial, Commercial, and Institutional) such as batteries, cleaners, or flammable material (which may include small quantities of liquid wastes). In 2010, approximately 25 million tons of MSW were sent to private and public waste disposal facilities, with local governments spending 2.9 billion $, for waste disposal (CCME, 2014). There has been an increase in the costs of 12% from 2008 to 2014. Collection and transportation costs make up the largest portion of these expenditures, followed by the operation of disposal/processing facilities ($517 million), and paying tipping fees ($425 million). The largest increases between 2008 and 2010, however, were costs related with remediation, landfill post closure and maintenance funds ($93 million; up 60%) (Statistics Canada, 2010)[31].

Many smaller communities in Canada do not have the resources to maintain a proper waste-disposal site. Garbage dumps, however, are considered unacceptable by the neighboring communities and can be a serious fire hazard, resulting in considerable damage each year. The larger Canadian cities now use sanitary landfilling. There are 1,973 operating landfills in Canada, of which 70 have landfill gas recovery implemented. Most provinces have been moving towards regionalization of landfill facilities over the past 10-20 years, closing smaller, older, unlined facilities and using fewer, larger, lined facilities constructed to meet improved environmental standards. Waste incineration (also called Waste to Energy, WtoE) is a common method of refuse treatment in Canada, despite opposition of local communities and organized environmental NGOs.

Most waste related public investment still goes into waste disposal management rather than waste diversion. Local governments spent on average 15$ per person on the operation of disposal facilities, 5$ per person on the operation of recycling facilities, and 2$ per person on the operation of organics

[30] Canadian Council of Ministers of the Environment (2014) State of Waste Management in Canada, prepared by Giroux Environmental Consulting.

[31] Statistics Canada (2010) Waste Management Industry Survey: Business and Government Sectors. Catalogue no. 16F0023X. Website: http://www.statcan.gc.ca/pub/16f0023x/16f0023x2013001-eng.pdf.

processing facilities, in 2010. How much and where funding is spent in relation to waste management varies by province and politics. Usually, the more a province invests, the higher the diversion rate.

Residential packaging and printed paper (PPP) recycling programs are widely established in urban areas across the country and in many jurisdictions almost all single-family households are provided with either a curbside or depot recycling program (multi-unit buildings typically have recycling services within the building or access to a depot system in many jurisdictions).

Beverage containers are a specific category of recyclables and diversion programs operate Canada-wide. There are significant differences between how these containers are collected, who pays for it and how much is paid as refund. The province of Québec has a hybrid program through which deposits cover some of the beverage containers and a parallel multi-material system collects the rest. Other jurisdictions operate a deposit program for all beverage containers. Some provinces (Quebec but not British Columbia) run specific 'product stewardship programs' for specific beverage containers. Only wine and liquor bottles are on a deposit fund system, while the beer industry operates a separate deposit return system.

The data shows that deposit-return container programs consistently get higher return rates than non-deposit container programs. In addition, depots provide an opportunity for economic benefit, particularly in remote and northern locations, through formal but also informal employment.

There are three distinct ways of managing waste, in terms of stakeholder involvement when addressing waste management: (1) Government institution (e.g., city, town, regional district) or waste management board or commission (e.g., a number of local governments may agree to jointly administer a landfill or a recycling facility). (2) Establishment of Public Private Partnerships PPP (contracting out waste management services). (3) Private business enters into contracts with clients other than local governments. Waste management jurisdiction and legislation vary from province to province. Below, we present the relevant legislation for the two cities, involved as case studies (Vancouver and Montreal).

British Colombia (Vancouver)

The key solid waste management legislation in BC is the *Environmental Management Act* (EMA) (2003), including the Recycling Regulation (2004, 2012); the Organic Matter Recycling Regulation (OMRR) (2002); and, the Waste Discharge Regulation (2004). The EMA requires that all Regional Districts (municipal) prepare and submit a solid waste management plan. These plans include management of recyclable material and MSW. There are no provincially operated product stewardship programs. EPR Waste diversion programs are operated by producer organizations and report directly to the BC Government through the Ministry of Environment. The province of BC does not have any kind of agency or delegated authority in place to manage and oversee programs as is the case in many other jurisdictions (CCME, 2014).

Quebec (Montreal)

Québec's Environment Quality Act provides abilities and a framework related to waste management, including policy development, 4Rs hierarchy, regional planning, reduction, diversion and reclamation, and disposal. It obligates government to adopt a national residual material management policy, which outlines principles for waste management and defines objectives for reduction, diversion and reclamation. This Act is supplemented by a number of additional legal frameworks: (a) the Act Respecting the Société Québécoise de Récupération et de Recyclage (*the est. of Recyc-Québec*); (b)

the Act Respecting the Sale and Distribution of Beer and Soft Drinks in Non-Returnable Containers; (c) the Beer and Soft Drinks Distributors' Permits Regulation (1984) (d) the Act for Sustainable Development (2006) defining 16 principles including responsible production and consumption, polluter pays and cost internalization, the Regulation Respecting the Recovery and Reclamation of Products by Enterprises (2011) [EPR regulations], the Regulation Respecting Compensation for Municipal Services Provided to Recover and Reclaim Residual Materials (2004, 2010), and the Regulation Respecting the Reuse of Water Containers with a capacity exceeding 8 liters (CCME, 2014).

3.3.2 DESCRIPTION OF THE INITIATIVES

The practice of collecting bottles and cans for deposit fund returns, scavenging, garbage picking or dumpster diving, is called 'binning', and is a common practice in most larger cities in Canada. Binning recovers not only recyclable beverage containers, but can also include food, clothing, car batteries and other items of value from dumpsters. The informal waste recycling and recovery is largely driven by socioeconomic conditions of marginalized social groups or the poor, who collect and recycle materials for an income. Their numbers have directly increase with funding cuts in social programs (Tremblay, et al., 2010)[32]. Informal recyclers in Canada have largely been studied in Vancouver (Tremblay, et al. 2010; Wittmer, 2014)[33], Victoria (Gutberlet et al., 2009)[34] and Halifax (Atchison, 2012)[35]. Females more often work with a partner and commonly team up with other female waste pickers for protection and support. Collecting, sorting and selling materials is an informal employment that full time and many part time binners depend on for their livelihood (Wittmer, 2014).

Recognizing the role that the informal waste sector and its participants have in the community, promotes societal good and can generate support for social enterprises and cooperatives (Scheinberg & Anschutz, 2006)[36]. Nevertheless, dialogue between informal recyclers with local government agents is often very difficult.

The city of Vancouver has spearheaded a very successful innovation with supporting the creation of United We Can (UWC), a social enterprise bottle depot company. Today UWC employs local residents and has grown to support over 600 full time and part time staff. The initiative started as a small network employing a few homeless dumpster diving men and women and has grown to a social enterprise that recycles approximately 60,000 containers a day. In addition, the binners also keep the

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[32] Tremblay, C., Gutberlet, J., & Peredo, A. (2010). United We Can: Resource recovery, place and social enterprise. Resources, Conservation And Recycling , 54 (7), 422428. http://dx.doi.org/10.1016/j.resconrec.2009.09.006

[33] Wittmer, J. (2014). Environmental governance, urban change, and health: an investigation of informal recyclers perspectives on wellbeing in Vancouver, BC (Masters). University of Guelph.

[34] Gutberlet, J., Tremblay, C., Taylor, E., & Divakarannair, N. (2009). Who are our informal recyclers? An inquiry to uncover crisis and potential in Victoria, Canada. *Local Environment*, 14 (8), 733747. http://dx.doi.org/10.1080/13549830903096478

[35] Atchison, D. (2012). Regulation, Recycling and the Rise of Informality: Deposit Beverage Container Collection on the Halifax Peninsula (Masters). Dalhousie University.

[36] Scheinberg, A., & Anschutz, J. (2006). Slim pickin's: Supporting waste pickers in the ecological modernization of urban waste management systems. *International Journal of Technology Management & Sustainable Development*, 5 (3), 257270. http://dx.doi.org/10.1386/ijtm.5.3.257/1

lanes (small allow ways in the city) clean and safe by collecting waste and syringes disposed in public locations (United We Can, 2018)[37].

Through the support of Vancity, a community loan fund, and the BC Provincial government; UWC was able to expand the company in the first year and pay for the rent and initial wages of the employees. The UWC hires waste pickers and provides the workers with structure, a sense of community, steady income and the opportunity to gain new job skills (Dale, & Newman, 2006)[38]. This social enterprise promotes a respectful working environment by implementing a *Binners Code*, which makes recommendations of behavior and attitude between other co-workers and the community (Tremblay et al., 2010).

Similar to grassroots initiatives in Vancouver and Brazil, but on a smaller scale, *Projet Consigne* was created in 2004 by two volunteers (Marina and Marica). The project offers free collection points for refundable containers within businesses of downtown Montreal. Established in 2005, the pilot project was developed to test the possibility of implementing a larger collection system to Downtown Montreal. After 6 years, there were nearly 110,000 containers recovered on foot by the binners. Finally, in 2012, the initiative gave rise to the cooperative, called Les Valoristes.

3.3.3 DIFFICULTIES/CHALLENGES

Unsupportive legal framework

Les Valoristes is facing a familiar battle to that of UWC's in the early 1990's. In Montreal, the former Liberal government had agreed to *"increase the price of refundable containers from $0.05 to $0.10 in 2013"*, but the outcome of the provincial elections in 2013 placed the conservative *Parti Québéquois* in power, who has since put the brakes on the proposed deposit increase for recyclables. The value of the refund has stayed the same since its creation in 1984, without even adjusting to inflation. For Les Valoristes, "*fighting provincial laws and powerful food and drink retailers for an expansion of the deposit-refund system in Quebec",* is integral for Montreal's binning community (Marica, Les Valoristes).

Stigmatization

Binners often use shopping carts in order to transport their collected products. There is a strong social stigma attached to the use of shopping carts because of their noise and the police confiscating the carts from binners on charges of theft. Prevailing understandings of waste and poverty are linked with neoliberal ideologies/politics and have further contributed to the criminalization of informal scavenging, recycling and vending.

Low economic return

[37] Website: http://www.unitedwecan.ca

[38] Dale, A., & Newman, L. (2006). Sustainable Community Development, Networks and Resilience. *Environments*, 34 (2): 17-27.

Binning was found to be a productive informal economic activity, but most of the people involved earn very little from this activity (in Victoria, BC, e.g. on average $10-$30 per day? Month? What are the average earnings?) (Gutberlet, et al. 2009).

Health concerns

Among the major health concerns related to binning activities are: occupational injuries, food spoilage and related spread of disease, cuts, as well as general environmental health issues from garbage sometimes spreading in alleys.

Overall, it seems that the many constraining factors that afflict informal recyclers' livelihoods (such as legal restrictions and barriers such as bylaws prohibiting scavenging; stigmatization and poverty), increasingly restrict the geographies of survival of the binners, affecting the way that these workers access resources.

3.3.4 ACHIEVEMENTS

Despite operating in different cities, both Les Valoristes and UWC work towards a common goal of drawing public attention to the social benefits associated with improved deposit-refund systems. Over the years these initiatives have significantly contributed to making binners visible. Les Valoristes view UWC as a model "of social involvement in addressing city waste management issues", and are working hard in hopes of one day creating a UWC-style depot in Montreal (Les Valoristes, 2018)[39].

Both initiatives (Vancouver and Montreal) have created numerous opportunities for binners to complement their income or even to maintain their livelihoods through the activity of retrieving beverage containers for deposit refund. In their negotiations with the government they argue that impoverished city residents require low-barrier services in order to support themselves and binning is a real alternative for them.

There are also indirect achievements, such as the creation of social capital, citizenship building, empowerment and increased hope among a population, considered the most excluded and vulnerable in many cities in Canada. These two initiatives underline the importance of political spaces where informal recyclers' interests can be voiced and promoted.

3.3.5 FUTURE INTERVENTIONS

It is important that civil society actors continue to push for these local governance mechanisms to include long-term planning and support, rather than short-term funding contracts and support schemes. Voices from the margins must also be included in the prioritization of local issues and the governance of the city in order to meaningfully change societal attitudes toward informal recyclers and their work (Wittmer & Parizeau, 2016). Organized grassroots initiatives and the opportunities they present in reclaiming resources from solid waste as well as generating income and thus reducing urban poverty levels need to become active partners in the dialogue with Government and then concretely be included and reflected in the city's official *Waste Management Plan*.

[39] http://www.cooplesvaloristes.ca/

According to the Canadian Council of Ministers of the Environment (CCME, 2014) the current government's priorities are to increase waste reduction and resource recovery and contribute to the transition toward a circular economy in Canada.

3.4 WASTE GOVERNANCE IN KISUMU, KENYA

3.4.1 INSTITUTIONAL CONTEXT

Kisumu is the third largest city in Kenya and one of the fastest growing cities in the Country. It stands on the shores of Lake Victoria, the second largest fresh water lake in the world and covers an area of approximately 417 Km^2, 35.5% of which is Lake Victoria. It is the County headquarters and the principal city in Western Kenya. Having developed progressively from a railway terminus and internal port in 1901, the city has become one of the leading communication and trading confluence for the Great Lakes region (Tanzania, Uganda, Rwanda and Burundi). Surrounded by an agriculturally rich hinterland mainly supporting large-scale sugar industry and rice irrigation, Kisumu's contribution to the National economy is significant. Its rich endowments, such as the lake itself and fertile agricultural land, give rise to its thriving economy. With 600,000 inhabitants, Kisumu shows rapid urbanization rates (2.7% yearly). It has a planned city centre and a large peri-urban fringe of unplanned informal settlements. In these settlements, 60% of the population live with poor housing conditions and are exposed to frail service delivery, unclear legalities, and poor policy design.

Kisumu City generates approximately 400 tonnes of solid waste daily. 65% of which is organic in nature and 27% is recyclable. Waste collection is carried out by the City Council, registered companies with permits or recognition letters, and small private (sometimes informal) entrepreneurs. The City can only manage to collect waste from the Central Business District (CBD) and market areas. Other areas, including most residential areas, are managed by private collectors depending on the residents' financial ability and willingness to pay for the services. Despite efforts to improve the waste collection services, the current daily collection of garbage is poor. Waste collection rates range from 20%-25%, with the remaining 75%–80% left accumulating in the backstreets, markets, road sides, drainage trenches and open spaces more so in the informal settlements (County Government of Kisumu, 2015[40]). However, with 65% of the waste being organic and more than 25% recyclable, the potential for improvement is significant.

In the recent past, the solid waste management has been a big challenge to City managers and the County in general. The poor management of solid waste results in generation of leachate which pollutes the ground water and soil, spread of infectious diseases, blockage of sewers and drainage systems, spread of foul smoke from private burning of waste as well as pollution of Lake Victoria through run-off. The solid waste management capacity of the City is overwhelmed by the increasing demand for these services due to lack of solid waste collection facilities and low efficiencies in operation of existing facilities as well as the design, capacity and location of final disposal sites. Household waste is rarely collected except by a few public clean-up exercises organized by NGOs or CBOs. The private waste pickers**,** recyclers and other operators have attempted to bridge this gap, but with little impacts, so far. On the other hand, the City is stuck with an open solid waste disposal site (called the Kachok dump site) in the middle of the city, which started in the 1970s as a depression quarry site to be filled up with waste materials and it is currently full and overflowing with waste, and has become a nightmare in the City. Further to this, it is home and a source of livelihood to more than 80 waste pickers (dump pickers) who live within the dump site, an environment with no housing and sanitation facilities, and no security arrangements, exposing them to serious health and safety risks. Its

[40] County Government of Kisumu (2015) *Kisumu Integrated Solid Waste Management Strategy: 2015-2025.* Kisumu, County Government of Kisumu, 102 pp.

relocation to more suitable sites outside the City as a sanitary landfill has not been possible due to economic, social as well as political implications. However, the county Government, backed by the current political goodwill, has started evacuating the inert material to rehabilitate a nearby quarry and is keen in relocating it altogether.

There is no doubt, the city has no systematic way of segregating and handling of different waste streams. The current County Laws governing the sector don't have adequate provisions to deal effectively with the ever-growing problem of solid waste management (County Government of Kisumu, 2015). The city therefore lacks a comprehensive and strategic response to solid waste management. Coupled with this, there is a poor attitude towards waste materials and waste management practices by the city residents. Waste is indeed something with no value, it is dirty and few would want to associate them with it. While there are some viable waste business enterprises within the city, they lack technical, financial and policy support to achieve their goals (County Government of Kisumu, 2015).

Policy, governance and regulatory framework

The constitution of Kenya (2010)[41] has profound implications for the management of the environment including chemicals and solid waste at the national, regional and county levels. It shapes the laws, policies, institutions and processes by which environment governance including waste is managed in practice. In its preamble, it recognises the environment, as our heritage and calls for its sustenance for the benefit of future generations. Sustainable development is listed as one of the national values and principles of governance in Chapter 2, Part 10 (1) of the Constitution of Kenya.

To address the waste management challenges, the national government developed a Waste Management Strategy in 2015 to guide sustainable solid waste management in Kenya and ensure a healthy, safe and secure environment for all. Key in the strategy is to ensure that waste management is addressed from the life cycle approach, which includes waste generation, collection, transportation, treatment and disposal. It calls for the adoption of solid waste management hierarchy in order of priority as prevention, minimization, reuse, recycling, energy recovery and finally safe disposal. This is consistent with Vision 2030, the overall development blueprint for Kenya to achieve middle income economy by 2030. Its social pillar aims at ensuring development in a clean and healthy environment. The national environment policy (2014) gives a framework to guide Kenya's efforts in addressing the growing environmental issues and challenges including urbanization, waste management, pollution, chemicals management amongst others (Sessional Paper No. 10 on the National Environment Policy, 2014). The Environmental Management and Coordination Act (EMCA) (1999 amended 2015) is the primary statute and legal framework in Kenya on environmental matters. The Act provides for the establishment of an appropriate legal and institutional framework for managing the environment and related matters. It establishes the National Environment Management Authority (NEMA) to provide overall supervision and coordination of environmental issues, in liaison with other lead agencies. Section 3 of EMCA stipulates that every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment.

[41] The Constitution of Kenya (2010) Laws of Kenya. National Council for Law Reporting with the Authority of the Attorney-General. 193 pp. Website: www.kenyalaw.org.

City governance and waste management

The County Governments Act (2012) is an act of parliament which gives effect to chapter eleven of the 2010 constitution of Kenya to provide for County Governments' powers, functions and responsibilities to deliver services and for other connected purposes. The Urban Areas and Cities Act (2011)[42] states that. the management of a city and municipality shall be vested in the county government and administered on its behalf by: (a) a board constituted in accordance with section 13 or 14 of this Act; (b) a manager appointed pursuant to section 28; and (c) such other staff or officers as a county public service may determine (County Government of Kisumu, 2010). The Act makes it very clear that the entities governing an urban area or a city carry out their functions and exercise their powers on behalf of the county government. This is underscored by the provision that the relationship between the county government and the boards of urban areas and cities is a principal agent relationship, as described in the Urban Areas and Cities Act (2011) – s11 (b). The boards operate within the jurisdiction of the county government and are accountable to the county government.

3.4.2 CREATION OF WASTE PICKER ORGANIZATIONS

Solid waste is a pressing issue and the city is overwhelmed by the growing waste generation and the limited resources and capacity to expand its collection services. The uncollected waste, particularly in informal settlements, poses great health and environment hazards to the population, including drainage blockage, flooding's, ingestion by livestock, or providing breeding ground for mosquitoes. In regard to these facts, the city has developed policies that encourage private-public partnership (PPP) to expand waste collection in informal settlements. For example, a project funded by the United Nations in 2010, provided a ten-year Kisumu Solid Waste Management Plan (KISWAMP) in partnership with then, Kisumu Municipality. Therefore, the waste collection, transport and disposal services are provided by a mix of actors, ranging from the private sector (referred to as registered and unregistered "waste entrepreneurs") and the public sector, e.g. the County and City governments. Unlike in other cities, where the entrepreneurial model can conflict with existing practices, infrastructures, routines and vested interests, the new entrepreneurial model filled a gap in the existing municipal services, and the City recognises their crucial role in servicing the population. The key challenge in Kisumu, however, has previously been the failure of the Municipality to collect the waste from the waste transfer points, which is also an essential aspect for local waste entrepreneurs.

Kisumu shows how social initiatives born as CBOs succeeded in expanding as small-medium enterprises, some of them relying on more stable business models. The entrepreneurs have taken advantage of opportunities of formal waste management system failures by filling gaps for under-serviced clients, and by providing solutions to those parts of the city that are not supplied by the formal services. The complexity of the solid waste management system in place means that there are a large number of informal and formal actors involved, who can be categorised. In the private sector, *recyclers* differentiate themselves into *dump pickers* (locally called Chokora), who sort out recyclables from waste scattered in the settlements or at the city dump, and *waste pickers, waste entrepreneurs*, or *community-based organisations (CBOs)* who collect waste from households and businesses and then sort out recyclables. It is estimated by the City that over 300 people work informally in the waste

[42] Urban Areas and Cities Act (2011) Laws of Kenya No. 13 of 2011. National Council for Law Reporting with the Authority of the Attorney-General. 30 pp. Website: www.kenyalaw.org

management sector in Kisumu, 200 employed formally, plus the staff employed at the City and County level.

The Kisumu Waste Management Association (KIWAMA) and the KIWAMA Savings and Credit Co-operative (SACCO) were formed in 2009, in Kisumu, with the support of KISWAMP for members such as Gasia Poa, Kisumu Waste Management Services (KWAMS), Clean Kisumu General Investment (CKGI), Kisumu Waste Management (KIWAMA) Sacco Cooperative, or Kisumu Clean, to access funds, to network and market. A seed money fund linked to a credit-guaranteed scheme was created to be managed by SACCO. Unfortunately, only a few entrepreneurs benefited and succeeded. Because of the weak financial management structures and non-competitive interest rates, the SACCO has since remained dormant especially when external funding stopped. However, the newly formed (April 2018) and registered Kisumu Waste Actors Network (KIWAN), supported as an initiative by JOOUST and KLIP Research activities, currently engages the City as well as the County to develop working relationships towards finding solutions to the solid waste management challenges in Kisumu. Unregistered waste entrepreneurs are especially keen on collaborating and creating (stronger) networks to avoid monopolies of cartels. Over 50 waste actors operating within the city has so far expressed willingness to join KIWAN (KIWAN, 2018)[43].

3.4.3 DESCRIPTION OF INITIATIVES

In Kisumu, the waste actors' network consists of individual waste actors who tend to operate independently, but are anchored at different sections of the waste management value chain (e.g. waste collection, transport, sorting, bulking, recycling, disposal, etc.), dealing with different types of waste streams. The waste streams include but are not limited to; organics, plastic/polyethylene, paper, saw dust, electronic waste (E-waste), metal, rubber, clothing, glass, charcoal dust, bones etc. These initiatives are part of the waste stream and are described under the section of the waste management value chain and the scale of operations (quantity of waste resources manipulated and income). The waste actors operate at different levels. At the lowest level are those concerned with waste collection and disposal, and it also includes individuals (waste pickers) who collect specific materials and sell them to the local scrap dealers. The waste entrepreneurs collecting waste from business premises, institutions and households especially within informal settlements operate at this lowest level.

The next level includes those who purchase specific waste materials (e.g. plastics) from the waste pickers /entrepreneurs, sell in bulk (sometimes in crushed form) to big companies, which eventually convert the waste materials into different new products. The highest level includes the big companies using the specific materials to make new products. They include plastic, paper and steel industries. Most of these companies are in Nairobi.

3.4.4 DIFFICULTIES/CHALLENGES

Waste collection challenges include financial limitations – affecting those living in the dense peri-urban informal settlements of Kisumu. Those without services manage waste individually through methods such as indiscriminate dumping, burying and open burning of waste.

[43] KIWAN (2018) Profile - Kisumu Waste Actors' Network. Kisumu City. Research Report.

To dump at Kachok, one must receive a license of operation and thereby be acknowledged by the government as legitimate. However, the implementation of licensing has been minimal and most private collectors operate under a letter of recognition from the City Department of Environment. Quite a number also operate without any form of recognition in a way that their actions, including where they dump the collected waste, cannot be well traced. Harassment from the City officials/NEMA officials, the locals, dump pickers are a threat.

3.4.5 ACHIEVEMENTS

The role of private collectors remains relatively excluded from government services due to its entrepreneurial nature. Waste pickers and dump pickers first interact with the waste in recovering recyclable and reusable material for resell. Once the recovery has been done, a series of buyers purchase the bulk materials from the waste pickers. Then, a varying amount of resell for profits occurs until final transportation of recovered materials made to recycling plants in nearby urban hubs, namely Nakuru and Nairobi. These waste collection and separation contributions add to the efforts of the City in waste management and also generate a source of income to the waste pickers.

3.4.6 FUTURE INTERVENTIONS

Differing and controversial perspectives between the department of environment, NEMA and the department of public health as well as other stakeholders on how to best approach solid waste management have led to a standstill in collaboration. The following possible future interventions are needed for a collaborative approach in waste management:

- Formally establish autonomy of county and city offices and develop effective working relationship with other government agencies.
- Establish formal working relationships/partnerships between the City, Youth groups, CBOs and waste actors for coordinated and effective operations, and not only the license or recognition letters for private collectors.
- Establish formal recycling centres with appropriate facilities across the city, including a proper sanitary landfill.
- Seek external funding for community mobilization e.g. the United Nations, etc.
- Provide entrepreneurship training for recognized private collectors.
- Review waste management by-laws and policies to be more practical and realistic to create opportunities for efficient solid waste management.

3.5 WASTE GOVERNANCE IN THE METROPOLITAN REGION OF MANAGUA, NICARAGUA

3.5.1 INSTITUTIONAL CONTEXT

The development of an integrated system of waste management in Nicaragua is still a pending task. Although there are general laws and policies about the environment, and a national policy for the integral management of solid waste. There is a lack of a legal framework that articulates efforts for the reduction in the generation of waste, reuse, management, recycling, elimination and final disposal of waste throughout the country. The needs for a particular law on waste arises to avoid conflicts of competence and gaps that are currently obstacles in the inclusive management.

Despite the fact that in 2014, the first steps were taken in the approval of a proposal for the "*Special Law for the Comprehensive Management of Hazardous and Non-Hazardous Waste"*, nowadays it has not been approved and lacks in particular with its implementation. The special law also seeks to visualize and dignify the work carried out by waste pickers, traditionally called "churequeros", who have dedicated themselves to work of recovering waste inside and outside landfills; besides representing a vulnerable sector of the population whose work has a positive impact on the protection of the environment.

Managua, the capital of Nicaragua, until 2012 had the largest open-air garbage dump in Central America: La Chureca, located on the shores of Xolotlán Lake. In 2007, with the support of the Government of Spain, began the project of closure of this landfill, which resulted in its privatization and management by the Municipality of Managua; the establishment of an urban waste treatment plant to produce compost; and also the displacement of local residents: the "churequeros", who had settled in that area.

The closure of the municipal landfill, after forty years of use and with an accumulation of four million cubic meters of garbage deposited without control, also implied preventing access to waste pickers. This led waste pickers being organized to achieve space and a voice, since the collection and separation of recyclable garbage inside the landfill represent their only means of livelihood. In 2010, the national network of waste recyclers called for the creation of the "Red de Emprendedores Nicaragüenses del Reciclaje (REDNICA)", which was created legally, with the aim of working on the generation of spaces for dialogue with the Municipality, supporting waste pickers in their organization in collectives and contribute to improve the quality of life and environmental sustainability in Nicaragua. These efforts were supported by cooperating organizations and networks of regional waste pickers.

3.5.2 CREATION OF WASTE PICKER ORGANIZATIONS

According to the latest available data, Managua produces an average of 40,000 tons of garbage per month, so the municipality's capacity to collect all the waste and garbage from the city is insufficient, and the work of the waste pickers in the garbage collection and classification becomes even more relevant. In the country, 52.1% of the population are serviced by a garbage collection truck; 34.6% eliminate their garbage by burning; 7.8% throws their solid waste in open spaces, uncultivated land, waterways, and streets or into deep ravines and gorges; and 3.1% bury their waste.

There are officially 13, 500 waste pickers in Nicaragua (see: REDNICA[44]). In some cases, the initiatives of waste pickers as collectives began as a need to generate sources of income for their families, who are part of a vulnerable sector of the population. In addition, organizing themselves provides them with a voice. There is an opportunity to be heard by the Municipality, so they perform their work and can potentially obtain benefits such as health care, a decent salary and recognition of their work.

In other cases, the initiatives are born as projects of international cooperation agencies in alliances with the Municipality. In addition to creating jobs and contributing to the cleanliness of cities, their work supports environmental sustainability of the country. In both cases, regardless of motivation for their creation, the contribution of these groups to the conservation of the environment is important.

Even though there are environmental organizations that have worked on the issue of preservation and conservation of the environment since the 1960s, the efforts to create these initiatives as self-managed groups became effective since 2008; where the closure of the main source of waste collection occurs, "La Chureca". National and international organizations and City Halls are the ones that have facilitated the process of formal creation of the initiatives as collectives, since the waste pickers have always existed individually, dedicating themselves to the collection, cleaning and classification of waste from the landfill.

3.5.3 DESCRIPTION OF THE INITIATIVES

The predominant form of organization of these initiatives of waste pickers is the Cooperative, formed on average by 27 members, mostly aged between 16 and 49 years, with low levels of education and with high rates of illiteracy for the most adults. On average, they receive an income less than one dollar a day, for the sale of their services. The percentage of participation of women is between 39% and 67% of the total of members. Nevertheless, women are the ones who lead the directives in their majority. These initiatives are mainly devoted to the collection, cleaning, transport and classification of recyclable materials without adding further value, which are then sold to the middlemen. Some initiatives are diversifying into the creation of handcrafted jewelry or bijouterie and "piñatas".

The main materials that they recycle are paper, cardboard, plastic, glass, and in less percentage metals such as copper, bronze, aluminum; which are collected in landfills and streets. Some initiatives have achieved alliances with private companies, with the municipality and/or individual households to collect waste from the source. Likewise, they have had support from the population (households) in the classification of the waste, by delivering the classified materials to the waste picker organizations.

For the development of their activities, they receive support from private companies in the provision of equipment for the protection and transport of waste. In the particular case of Ciudad Sandino, the Municipality facilitates access to a collection center to accomplish the tasks of classification of the waste. They have also received support for the purchase of machinery and transportation that facilitate the collection. While it is not common, it sometimes happens that other cooperatives can also use

[44] Website REDNICA: https://rednicaenlinea.wordpress.com/2018/04/02/redlacre-debate-sobre-economia-circular-en-latinoamerica/

these facilities; since the main limitations they have is transportation and the transformation of materials to receive a higher payment for them.

The management of funding is mainly coordinated through REDNICA, who is the main representative of these waste picker initiatives. REDNICA also supports the formalization of the cooperatives; gives training workshops on cooperative topics, human rights, and environmental issues; facilitates alliances with private companies and the municipality; besides being the connection with cooperating agencies such as the European Union, Spanish Government, Swedish Cooperation, among others.

3.5.4 DIFFICULTIES/CHALLENGES

There are many challenges that these initiatives are currently facing in order to achieve sustainability. The performance as a collective is presented as one of the great weaknesses, due to the lack of technical capacities to have an adequate organization and administration of the cooperative; which has led to problems of transparency and confidence in the management of resources. Added to this, prevails the necessity of a change of mind from working individually with their family members pursuing individual well-being to working as a collective. That is why they are working to achieve greater cohesion among their members and achieve a vision as a whole group.

In terms of implementing their operations, they do not have the infrastructure and tools to improve productivity. Also, they do not have the machinery to process new products, which limits the sale of recyclables as a raw material. They also have difficulties with transporting the materials, which is the reason why they do not collect a greater amount of materials or approach other sources to collect from. All these factors translate into low levels of profitability of their operations, obtaining a lower payment from the intermediaries for the sale of recycled materials.

The restriction of collecting garbage at the municipal landfill, which has historically been the main source of waste, is another difficulty the waste pickers are facing today. In addition, the lack of a legal framework that recognizes their work and the need to formalize this sector in order to access social security and education are challenges to be addressed. To this moment (June 2018), the fight between waste pickers and the Mayor of Managua; over the access to La Chureca continues and has already resulted in physical disputes with the police when waste pickers try to access the landfill illegally. Although there have been some specific support initiatives, the long-term coordinated work with local governments to resolve this and other waste related issues is a pending task.

3.5.5 ACHIEVEMENTS

Among the main achievements identified is the model of the alliance with the Municipality developed by two initiatives, one located in Ciudad Sandino and the other in Ometepe Island; both as a result of coordinated work with other social partners such as associations of national waste pickers and international cooperation. Currently, only the case of Ciudad Sandino continues with this model.

Another achievement is the establishment of collection routes for source separated material (homes, companies, schools), since they mostly obtain the waste mixed once it reaches landfills. That is why they are working on the creation of alliances with companies, residential organizations and the municipalities, so that the collection can be carried out in a coordinated manner and without creating competition for garbage collection.

The organization as a cooperative is another great achievement, since most waste pickers still seem to work individually (as noted during field work). Therefore, deciding to work collectively is something important to highlight.

3.5.6 FUTURE INTERVENTIONS

So far, a dialogue has not been achieved with the Mayor's Office of Managua that guarantees safely the exercise of waste pickers' work and thus, an improvement in their living conditions, income and well-being. Hence, promoting communication and negotiation between waste pickers and the Government is one of the priorities in their work agenda.

Currently many of the initiatives are in a process of reorganization, with many lessons learned, so they commit to improving the management of cooperatives to work with more transparency and with a long-term vision; increase the collection of waste; establish direct contacts with companies; acquire machinery and work on the transformation of recycled materials with added value. For this, they are relying on the training and formation of their members.

Some initiatives are making a base line study (diagnosis) of all members of the cooperative, for the identification of the occupations, where the assignment of new job opportunities will be valued and to guide the development of training sessions. Likewise, the waste pickers aim to sell their recyclable materials without intermediaries, which has meant a great effort to date.

3.6 WASTE GOVERNANCE IN TANZANIA (DAR ES SALAAM)

3.6.1 INSTITUTIONAL CONTEXT

Dar es Salaam is Tanzania's largest commercial city, the third fastest growing city in Africa, with an estimated population of over 4.5 million people and growth rate of 4%. Over years, the city of Dar es Salaam has faced several environmental challenges including waste management. The city generates 5,600 tons of waste on a daily basis, putting pressure on existing infrastructure and institutional capacity (Huisman, et al., 2016)[45]. Consequently, only 40% of the waste ends-up in the city's only dumpsite, Pugu Kinyamwezi, whilst the remainder is burned, buried in open pits or disposed of in streets, streams or drainage systems. Only a small fraction is recycled or reused (Breeze, 2012)[46]. Yet, the city waste production is growing at an estimated 10% per year[47]. Even with several attempts to improve the policies and regulatory framework governing waste management, it increasingly remains a great challenge.

After independence in 1961, the government centralized the waste management activities under city/municipal councils and this service was provided for free by the government. Accordingly, the Local Government Act (1982), the Environment Management Act (2004) and the Solid Waste Management Regulations (2009) define waste management as an essential public service that should benefit all urban residents. Other relevant legislation such as the one dealing with land use planning, land acquisition and public health have a bearing on the solid waste management system. Almost all Acts charge local government/municipal councils with the duty to manage and minimize solid waste at source.

Dar es Salaam City Council (DCC) is responsible to manage all activities related to the dumpsite (coordination, planning, financing, maintenance and closure), while the five municipal councils that make up the Dar es Salaam region (Kinondoni, Ilala, Temeke, Ubungu and Kiganboni) oversee the collection and transportation of waste, as well as fee collection, local waste recovery, recycling and compositing (Huisman, et al., 2016). Each municipality is structured into a number of wards and service providers at the sub-ward level contracted by municipalities through a tendering process regulated by the Public Procurement Act (2013). The contracts at sub-ward level are mostly reviewed and renewed annually, creating a constant pressure to remain competitive.

3.6.2 CREATION OF WASTE PICKER ORGANIZATIONS

[45] Huisman, H., Breukelman, H. & Keesman, B., 2016. Expert mission on integrated SWM to DSM, Report of findings November 2016. [Online] Available at: https://docmh.com/expert-mission -on-integrated-solid-waste-management-iswm-to-dar-es-salaam-mat16tz01-report-of-findingsnovember-pdf [Accessed 1 February 2017].

[46] Breeze, R., (2012). Municipal Solid Waste Management in Dar es Salaam: Draft Baseline Analysis. [Online] Available at: http://siteresources.worldbank.org/INTUSWM/Resources/463617-1202332338898/MSWM_Dar-es-Salaam.pdf [Accessed 2 April 2018.

[47] Expert mission report on solid waste management in Tanzania: https://www.linkedin.com/groups/12001634

Although the government is basically in charge of waste management, waste collection, transportation and treatment are done by five major actors namely: i) city /municipal councils responsible for coordination of waste collectors and waste pickers; ii) private waste collection companies; iii) small groups consisting of residents who are in charge of collecting wastes from private residences and transporting it to temporary collection spots; iv) Community Based Organizations (CBOs) & Non-Governmental Organizations (NGOs); and iv) individuals (especially youth) collecting recyclable/reusable waste and selling it directly to intermediaries and waste pickers. The city council manages the dump site including overseeing the middlemen and waste pickers (Dump pickers) operating at the site. The municipal councils are responsible to collect and transport waste from the public places to the dumpsite, also, coordinating waste collection and transportation through wards and sub-wards. The wards authorize the formation of CBOs to operate waste collection systems, neighborhood waste collection sites and to collect fees for waste services. Whereas the service providers at sub-ward level are contracted directly by the municipality, the ward councilors and sub-ward chairpersons have a role in maintaining the relation with these service providers. Wards also enter into contracts with private sector service providers to collect waste directly from households or from the neighborhood collection sites. Three factors encourage this practice; constrained municipal budgets, the poor quality of waste collection services and the support of the government for public private partnerships.

In most places, the neighbourhood waste collection systems are established and operated based on neighbourhood and community agreements. For instance, in most affluent planned areas, waste is generally collected at curb side from households, commercial establishments, institutions and industries by the private companies and taken directly to the dumpsite. Where access by collection vehicle is impractical, collected waste is taken initially to neighbourhood collection sites by handcart for bulking and informal resource recovery before transportation to the dumpsite. In planned and unplanned areas where the populations are less affluent and the neighbourhoods are more congested, waste is picked up by handcart for delivery to neighbourhood collection sites or taken directly to these sites by householders. In some cases, individual waste pickers collect specific types of waste (e.g. plastics, aluminium scraps, iron sheets, bones, steel scraps, papers & glasses) from residential areas, business premises &institutions and sell them to intermediate dealers[48]. The private companies subsequently pick-up the accumulated waste from the neighbourhood collection sites for transportation to the dumpsite. In unplanned areas where waste collection service is poor, individuals commonly dump their waste into drainage ditches, streams and by the road side.

3.6.3 DESCRIPTION OF THE INITIATIVES

The mapping of 35 waste pickers organizations and groups in Tanzania indicates that most organizations (almost 43%) were unregistered/informal community-based groups, and that the private companies were operating under the coordination of wards and sub-wards (32%). The rest were registered associations (11%), self-help groups (7%) and CBOs (3.6%). In terms of the gender composition, most initiatives were dominated by males (66%). However, in terms of specific operations, women dominated cleaning activities (65%) and the separation of waste (54.6%), while men were more dominant in waste processing (91%) and administrative function (66%). The composition of gender in activities related to the commercialization of recyclable materials (e.g.

[48] It is estimated that about 50 to 60 waste pickers work at the site collecting recyclables for sale.

buying, selling and intermediary services), was almost equal for women and men (49.7% and 50.3% respectively).

The services provided by the various initiatives included: waste collection; waste transportation; disposal; sorting; processing, recycling; composting; as well as buying and selling of collected waste and of recyclable materials. While the waste collection was largely done by groups, individuals (called waste pickers) and CBOs; the transportation and disposal were mainly done by private companies; and the sorting was done by intermediaries. The practice is that waste collectors visit each individual household to collect garbage (waste pickers are the primary waste collectors from the source while recyclers are processors of the waste). Users leave their garbage directly outside their homes according to a garbage pick-up schedule set with the local authorities. In some cases, waste generators deliver the waste directly to disposal sites or transfer stations, or they hire third-party operators (or the municipality). The transporters collect waste from transfer stations/collection points and take it to the dumpsite or to recyclers (individuals/companies/organizations doing the separation for recycling, reuse and processing). The recyclers buy waste from the waste pickers. In some cases, there are intermediaries between waste pickers and recyclers. Notably, processing and recycling was mostly done by large manufacturing and recycling companies.

Although the majority of initiatives lacked adequate records of their incomes, costs and returns, the majority of them met their operational costs without generating surplus income. The greatest challenge was the high cost of transportation and employees. This challenge affects financial sustainability of most initiatives given the low rate of the payment for the waste collection service. Therefore, the local government supports the companies and groups operating in their localities to enforce payment of the fee. This is done through by-laws set by wards and sub-wards requiring each household to pay for waste collection.

Several initiatives involve youth to limited opportunities in other forms of employment. Although the youth play a very important role of collecting recyclable materials from streets and households, they receive very limited support from the local government and community itself. In most cases, they were perceived as drug dealers and thieves.

3.6.4 DIFFICULTIES/CHALLENGES

Both formal and informal actors faced the obstacles of poor citywide infrastructure and limited access to most unplanned areas. Formal actors navigated this challenge by locating most of their activities in the planned and serviced areas. Still, the travel time from points of collection to the dump site remains a great challenge. Depending on the time of the day, it can take up to two hours for a return trip to certain points in the city. One respondent claimed that *their vehicles were only able to make one to two visits to the dumpsite daily, due to spending an average of two to four hours on each trip in traffic.*

Per head flat rate charges to households regardless of waste production discourages some people from paying the fees. Most households were charged between 2.5 to 10 US$ per month depending on the number of households, income and the decision made at sub-ward and cell level regarding the prices (they decide on the price in collaboration with the community). Nevertheless, only 40-50% of the households paid the fee despite several efforts to follow-up with fee collection. Even though legally local leaders are responsible for the enforcement of the environmental law, the implementation of fee collection is still a challenge. These leaders are in charge of a range of governmental issues from fee

collection, social welfare and land rights, and therefore, the task of fee collection is largely left to contractors (companies, groups and their members).

Administrative challenges relating to the lack of enforcement staff, incompetence of management and lack of modern equipment and protective gear were observed. At least 83% of the waste pickers' organizations rent the equipment, which is expensive and unsustainable. In most cases, transporters failed to collect waste and, in some cases, did not operate according to the agreed schedule. Furthermore, transporters demanded cash payments from the groups while the households paid their fee at the end of the month. This compelled the groups to raise working capital from their own sources, family members and credit cooperative societies. However, access to credit was very limited due to failure to meet the loan requirements. Consequently, over 57% of the initiatives did not receive any fund from the external source to start their operations. In addition, over 80% did not receive any facilities while almost 61% did not receive any training. Even after starting the initiative, over 90% did not receive any financial support from the government and/or other partners.

5.6.5 ACHIEVEMENTS

So far, four major achievements have been observed in Dar es Salaam. The first achievement relates to collaboration between the local government and waste collectors to enforce governance and accountability. For quite long, households had no trust in community-based groups in terms of transparency and accountability of the money paid to the groups. In 2015, the local government required all waste picker associations winning tenders from wards and sub-wards to have a bank account, electronic fiscal devices (EFDs) and be able to issue the EFD receipts for payments made by the households. The private companies collecting waste were also required to issue EFD receipts to their clients. The local government was motivated to ensure compliance given that they earned 10% of the income generated through waste collection. Consequently, the households raised their confidence and trust in groups and companies collecting waste and this increased fee collection for over 50% for some groups.

In addition, the control mechanisms imposed by the municipal councils to registered groups facilitate them to control theft and misuse of the groups' funds and to ensure that transporters are paid on time. The greatest control in this case emanates from the use of EFD receipts, involvement of the banks in all transactions and intervention of the municipal council. The practice is that waste collectors issue EFD receipts whenever they collect money from households. Once the receipt is issued the records are automatically transferred to municipal council records. When the payment for service providers and staff is requested, it is raised by the Group Treasurer, approved by the Treasury Committee and is forwarded to ward and municipal council together with the bank statement for final approval. The municipal council approves the payment after reconciling their EFD records with the bank's records. This process has enabled most initiatives to increase the confidence of the households in their initiatives contributing to their sustainability.

The second innovation relates to capturing the value of the solid waste materials created at the household and community level. The waste collectors are motivated to collect waste because of the opportunity to generate income through direct selling, recycling or reuse. Recycling and reuse of waste materials especially papers, wood, plastics, nylon, glass and iron have opened up business opportunities for the recyclers, middlemen and waste collectors (both formal and informal). Consequently, the recyclable materials are hardly seen in the city of Dar es Salaam, mainly because informal waste collectors reclaim and sell them to middlemen and/or recyclers. Still, sorting, processing and recycling were considered the first priority by only 7% of the formal waste collectors.

This is simply because they collected all the waste and dumped it at the dumpsite where these processes were done. In view of this, there is a great opportunity to capture the value at the source, which can create more employment to youth, reduce the congestion of waste at the dumpsite and keep the city clean.

The third achievement relates to partnership and linkages among formal and informal waste collectors. The private companies with modern facilities collaborate with informal groups in different ways. Some of them rent their vehicles and compactors to groups at a subsidized price. One of the companies studied was serving 12 groups. In addition, the company trained the groups on governance and management of their groups. They had also trained the groups on sorting waste, the use of protective gear and entrepreneurship. If this model is promoted, there is a great opportunity to develop strategic partnerships between the formal and informal waste collectors.

The fourth achievement was the use of community to enforce participation in clearing their areas and payment of fees to waste collectors. The sports clubs and security groups participated in cleaning their areas and supporting waste collectors in collecting fees. Some groups introduced a commission of 10% to group members who supported the fee collection tasks. Two sub-wards had Whatsapp groups which were used to encourage each other to pay for waste collection and participate in various cleaning campaigns.

5.6.6 FUTURE INTERVENTIONS

Most organizations aspired to expand the scope of income generating activities either through value adding activities in the waste collection chain or by introducing other complementary initiatives. At least 50% of the initiatives wanted to expand the scope of their activities. One of the most prominent strategies was the introduction of the revolving funding for the members. In an attempt to do that one initiative had introduced the membership fee of 0.5 US$ per day for the purpose of creating the revolving fund.

The waste pickers groups aspire to acquire their own vehicles, compactors and protective gears to address the challenges of transportation of waste. Actually, 50% of their income is consumed by the transporters posing the challenge of saving sufficient funds to pay the required vehicles and compactors.

Strengthening collaboration with the local government, private companies and other CBOs is a dream of some initiatives. One initiate is participating in the community football team and security groups. Collaboration with wards and sub-wards was considered instrumental given that the local leaders supported the groups to collect their fees. The district councils supported the groups to ensure compliance through the use of EFDs which ensures the communities the accountability of their money.

4. SELECTED GRASSROOTS INNOVATIONS BY COUNTRY

This chapter presents some of the grassroots innovations identified during our research with waste picker organizations, collected through interviews with waste picker leaders. The selection of these innovations is inspired by a fluid definition of grassroots innovations. We depart from an understanding of (a) a democratic, contextual, emotional and political process whereby (b) ideas, products, processes, materials, alliances, public policies or managerial methods are designed and developed (c) by waste pickers for waste pickers (d) favoring inclusive recycling that promotes socio economic inclusion of waste pickers and social change and (e) whose replicability needs to adapt to local contexts.

Informed by the interviews we interrogated our empirical material in search for 'instances' of innovation which not necessarily would imply that the whole waste picker organization was recognized as 'successful' by all actors and at the present time and place. Only those examples for innovations were selected from the total number of waste picker organizations that met the requirement of "grassroots" dimension. For example, demonstrating a clear connection with grassroots recycling movements, capturing value locally; demonstrating youth retention within the initiative through empowerment and coaching of the participants; highlighting the collective dimension, e.g. by negotiating and lobbying for work space and better prices for all members.

The selected innovations are presented below following this structure: a short history of the waste picker organization that has developed the innovation, a description of the innovation including relevant actors, resources and rationales articulated; the challenges encountered and the strategies articulated to address them; how the innovation has stabilized; levels of inclusivity of the innovation and bottom-up diffusion to other places.

4.1 SELECTED GRASSROOTS INNOVATIONS IN THE METROPOLITAN REGION OF BUENOS AIRES, ARGENTINA

4.1.1 RESEARCH AND DEVELOPMENT ON NON-MARKETABLE RECYCLABLES

Name of the initiative: Cooperativa Reciclando Sueños

Location: Isidro Casanova, La Matanza, Provincia de Buenos Aires, Argentina.

Name of researcher: Sebastián Carenzo

Type of innovation: Technology innovation on recyclable materials (product + process)

4.1.1.1 DEVELOPMENT OF THE INNOVATION

History of the waste picker organization

Created in 2003, Reciclando Sueños has pioneered the implementation of a differentiated “door to door” collection and sorting of household waste, in the metropolitan area of Buenos Aires (2006-2011). Drawing on this experience, the cooperative developed the technical and political foundations to their demand for social recognition of their practices as a public service. This trajectory is also characterized by developing technologies (tools, machinery and processes) specifically designed for their work. In recent years, they stopped collecting at the household level to focus on industrial waste by providing specialized waste management services to private firms. In this framework, they are developing processing systems for what they call ‘non-marketable’ waste, that is, potentially recyclable materials that lacks a stable market due to the existence of ‘technical obstacles’ to be recycled. Currently, they are developing a transformation system for three of these materials: Expanded Polystyrene (EPS), multi laminated / multi-material compounds (Doy-pack), beer label paper pulp. These materials are part of the industrial waste incorporated in the agreements with Large Generators of waste (LG). The objective of the R&D of the cooperative is to demonstrate the concrete possibility of recycling these materials, as a way to guarantee the "cradle-to-cradle" traceability. This would differentiate them from other private companies that also provide waste management services to LG but without exploring the recyclability of these "non-marketable" materials, as they dump them at landfills.

Photo 1: Creating Awareness: Members of the cooperative participating in an activity

Description of the innovation

The cooperative has developed a mechanical-thermal process that allows to transform the EPS into plain Polystyrene (PS). Once transformed into PS, it can be grinded and sold as raw material. There is no market for EPS, but as PS the average price is US$ 1/kg. Regarding the multi laminated / multi-material compounds (Doy-pack) the main problem is that the local recycling industry can not process it because it combines three different types of plastics in the same packaging. In this case, the

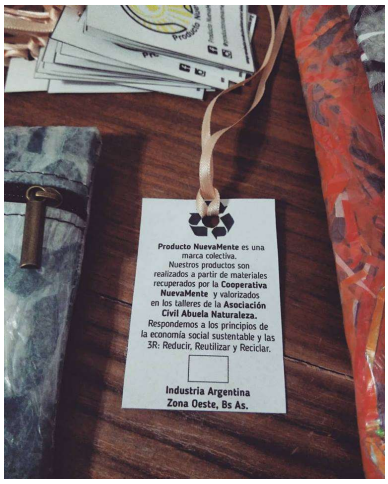

Photo 2: New Product Labels

experimental work developed at the cooperative consists of grinding the material and then exploring the aggregate in different dosages for extruding and pelletizing. The aim is to explore its use for manufacturing mass consumption goods (e.g. pots, waste bags). Finally, in relation to the beer label pulp something similar to the previous case happens. For marketing reasons, it is manufactured for resisting water and humidity, so it cannot be recycled with the hydropulper machines, used by the local recycling industry. Hence, it can not be marketed to the local middlemen and recycling industry. The cooperative developed a processing system that uses the pulp as a load for the manufacture of building materials (e.g. bricks, plates and thermal-acoustic insulators).

Actors

These technological innovations are developed through the cooperative's own experimental practices. In the case of EPS, engineers from the National Institute of Industrial Technology (INTI) also collaborated with the members of the cooperative for designing a first prototype of the machinery. In all cases the representatives of the industries from which the waste comes are also involved, which are interested in increasing the traceability of the waste they generate. Finally, the National University of Quilmes (IESCT-UNQ) is another relevant actor that seeks to document, strengthen and scale R&D practices, both in their technical and political aspects.

Photo 3: Members of the Cooperativa Reciclando Sueños designed a machine to manufacture plastic ropes reusing old factory machinery

Photo 4: Members of the Cooperativa Reciclando Sueños testing machines that they developed to transform the expanded polystyrene (EPS)

Resources

This experimental practice was developed basically with the cooperative's own resources and specific projects managed by the IESCT-UNQ and funded by the National Ministry of Science and Technology and the National Ministry of Education. It should be noted that the cooperative has manufactured most of the tools and machinery involved in the process using parts and discarded elements of old machinery.

Rationales

As mentioned earlier, the origins of these innovations are located in the experimental practice developed by the cooperative itself. On this basis, the IESCT-UNQ team collaborated in putting together a conceptual framework linked to these experiences. Thus, the main theoretical references used to support these experiences are linked to the issues of epistemic (in)justice, social innovation and social technology, grassroots innovations, low-tech technologies, inclusive innovations and social economy. However, it should be clarified that these frameworks did not drive the conception of the innovations but rather allowed them to establish a fertile dialogue between different theoretical and practical frameworks in order to conceptualize and extract learnings of the process.

Challenges encountered and strategies to address them

The problem-solution dynamics of the experimental process itself is a big challenge. In this sense, the lack of economic resources, but also the temporal discontinuity of the R&D process (as the cooperative runs these experimental processes while doing their daily working routine), are important obstacles. Another problem of great magnitude has to do with the difficulties at the epistemic level to accredit R & D competences to the waste pickers sector, since the mainstream understanding is that, any technological innovation in the field of waste management, is supposed to be carried out by professionals and career technicians. But, when accomplished by waste pickers, they face a lack of credibility and confidence in relation to their knowledges and skills. Therefore, recognizing the R&D competence of waste pickers, becomes a key argument to conceptualize the role of waste pickers far beyond being cheap labour, dedicated exclusively to work in collection and sorting of recyclable materials. The main strategies to address this goal have to do with framing this experimental practice in a joint project with the IESCT-UNQ as a way to scale up the process, but also to value the techno-cognitive repertoire of waste pickers.

Timeline

The practice of manufacturing technologies for the classification, conditioning and transformation of recyclables recovered from waste, goes back to the cooperative's own origins in 2003. However, the development of this R&D line is more recent, around 2012, deriving from the first negotiations with LG in order to establish agreements for the provision of waste management services. Since 2015, this initiative began to be supported with institutional projects of the IESCT-UNQ.

Changes and effects

In terms of external effects, it is assumed that when innovations are mature and can be implemented also in other organizations of this sector, they will have a positive effect on their economies (by increasing the value added). In environmental terms, these innovations increase the recyclability of these materials, which otherwise would be discarded. In relation to internal effects, the development of technologies has always been a key aspect of the identity of the cooperative. However, it is true that, like any innovation process, it generates tensions among its members in relation to define “urgent” vs. “necessary” goals, or between who wants to get involved and who not, etc. Another problematic aspect is to work the political dimension (and not only the economic one) of these innovations,

something that can not always be understood in depth, not only by waste pickers but also by government officials and academics.

4.1.1.2 STABILIZATION OF THE INNOVATION

In all cases, the innovations are in the phase of demonstration prototypes. Each transformation process is currently operative, including the design and manufacture of specific machines and tools. In the case of EPS, the cooperative has reached a stage of industrialization that is allowing them to process as to 2 ton/day of this material. However, what is still lacking is to acquire the capital that would allow commercialization of the operation in the three lines. This also means to scale up the activity in the cooperative itself as well as its transfer to the other cooperatives in the sector.

4.1.1.3 INCLUSIVITY OF THE INNOVATION

As we pointed out above, these innovations are key to strengthening the recognition of the sector as a key player in R&D linked to waste management. An area in which waste pickers have no representation at present, since they are relegated as mere suppliers of workforce in apparently unspecialized tasks. In this sense, this experience acquires a particular value as it allows the recognition of the competence of waste picker cooperatives to act as suppliers of technology for recycling, from a perspective that goes far beyond the economic, by including socio-environmental aspects.

4.1.1.4 WHO LEADS THIS INNOVATION?

The development of innovation is led by one cooperative (Reciclando Sueños) that has assumed the commitment to share it with other waste picker cooperatives, but not with other actors that seek to generate a lucrative company from these developments. Internally, of course, some of its members are more involved than others in the daily development of the experience, however the achievements are considered part of the collective work. Historically, those cooperative members that bring abilities for handling tools and machinery (e.g. derived from their previous labour trajectories), but also those that evidence a more active involvement with the cooperative character of the experience, have been committed more with this work.

4.1.1.5 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

There is no formalized exchange process, beyond the relations with engineers and social scientists within the framework of the projects. However, informal exchanges with members of other cooperatives are frequent, e.g. when they visit Reciclando Sueños. In fact, one of the long-term projects is the creation of a Reference Center in Social Technologies for Popular Recycling. This center could serve as a demonstration and horizontal transfer space for members of other waste picker organizations. Others have not yet picked up the innovation.

4.1.1.6 OTHER CHARACTERISTICS OF THE ORGANISATION INTERESTING FOR THE CASE AS A PROFILE

To address the collective patenting of these innovations.

4.1.2 RECYPLAYGROUNDS (RECIPLAZAS)

Name of the initiative: Unión de Carreros[49] de La Matanza

Location: Isidro Casanova and González Catán, La Matanza, Province of Buenos Aires, Argentina.

Name of researcher: Sebastián Carenzo

Type of innovation: Social inclusion through recycling, improvements of public space in marginal settlements, community capacity building (product + organization)

4.1.2.1 DEVELOPMENT OF THE INNOVATION

History of the waste picker organization

The organization arises from the need to face the frequent police abuses they suffered. Although animal traction is not forbidden in the territory of the Province of Buenos Aires, the intimidation was a constant before they organized in the "Asociación de Carreros" (AC). The organization arose gathering residents of Gonzalez Catán and Isidro Casanova two of the neigbourhoods with the highest concentration of poverty and misery. Especially after the economic and social crisis in 2001, the population dedicated to collecting waste as a way to earn a living has increased exponentially. Many of the carreros previously involved in scrap dealing, began to collect cardboard, paper and plastics due to the crisis. The idea of building playgrounds for children using recycled tyres and other objects is recent and related to their concerns about improving urban facilities in the precarious settlements where they live.

Description of the innovation

The innovation is quite simple. It is based on the manufacturing of a playground for children, by reusing tires and discarded materials, such as wire, paint and objects that are used for decoration. The location for the new playground is defined together with the local communities. Then a workshop is held on a weekend where the different models (cars, motorcycles, animals, climbers, etc.) are built collaboratively.

Actors

The idea was introduced by a young member of the association who once saw an armchair built with tyres. He then found several images on the internet, of armchairs and flower pots made in the same way. He shared the idea with other colleagues of the association and soon, they began to design toys for kids with tyres. They managed to design and build more than 20 different models of playground toys. A team of INTI engineers gave them technical advice on the technical specificities for the ground anchors of each model. At the same time, the established a partnership with Municipality of La Matanza, to get financial support for the building of recycled playgrounds in other neighbourhoods within the district.

[49] *Carreros* are waste pickers that use horse carriages

Resources

The resources needed for building the different models are minimum. The discarded tyres were obtained from shops that sell and replace tyres; while wire, screws, bolts and paint were obtained from the recovery of waste they perform as part of their daily work. The required tools (drill, jigsaw and grinder) were provided by members of the association. On average, the manufacture of the toys requires less than 200 ARS (7.4 US$) per piece on average. The key aspect is in the reuse of tyres, wire, paint and some pieces of other discarded objects.

Challenges encountered and strategies to address them

The *Carreros* are very used to work on their own, so to engage them in collective actions which are not urgent (such as to resist police abuse) has been an important challenge. For example, they tried several times to organize collective sales (with larger volumes and getting better prices than offered by middlemen), but they frequently failed because of mistrust among their colleagues who would gather the materials from each one and then negotiate to sell together. In this sense, Reciplazas project is a great opportunity to strengthen collective dynamics that later can be extended to other activities such as the sale of materials.

Timeline

The project began to take shape three years ago (in 2015) and is still going on.

Changes and effects

The capacity to collaboratively build collective action through this initiative is highlighted. On the one hand in relation to the organization itself as it is an opportunity to strengthen collaborative and collective dynamics. On the other hand, in relation to community building goals, as it involves the provision of recreational urban infrastructure in poor neighbourhoods and informal settlements, which lack these features and other key infrastructure (sanitation, water, transport, etc.). The collective construction of playground equipment allows to multiply the capacities in the communities that are involved in the project.

4.1.2.2 STABILIZATION OF THE INNOVATION

So far, they have built 7 playgrounds in different settlements and they hope that with the support of the local Municipality they can scale up the project.

4.1.2.3 INCLUSIVITY OF THE INNOVATION

The impact of this innovation is focused at the local level, basically circumscribed to the neighbourhoods to which the members of the association belong. Indeed, the Reciplazas began to have greater visibility through the promotion by Marcelo Loto (leader in Cooperative Recycling Dreams) during events and meetings where issues related to the sector were addressed. Marcelo has invited the ACLM to showcase their work, gaining visibility and support. The methodology of collaborative construction and the willingness of the members of the association to transfer the required know-how to other members of the local communities, favours the construction of capacities at the community level. The organization itself is fairly egalitarian, as its members are linked to specific common objectives, but do not have a collective daily work.

4.1.2.4 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

One of the community-based groups that took part in the construction of a Reciplaza has been replicating the methodology successfully in other locations.

4.1.3 NEW MIND GOODS (PRODUCTO NUEVA MENTE)

Name of the initiative: Cooperativa Nueva Mente y Asociación Civil Abuela Naturaleza (ACAN)

Location: Ramos Mejía, Morón, Provincia de Buenos Aires, Argentina

Name of researcher: Sebastián Carenzo

Type of innovation: recyclable materials, capacity building, empowerment (product + organization)

4.1.3.1 DEVELOPMENT OF THE INNOVATION

History of the waste picker organization

Both organizations arise in the context of the post-crisis of 2001, being also one of the pioneering organizations to work with waste pickers. The CBO Abuela Naturaleza (Grandma Nature) (ACAN in Spanish) was formed by middle class neighbours, sensitized by the poverty and precariousness linked to the crisis and by long-standing environmental concerns. They started by linking together the waste pickers that used to collect recyclables within their neighbourhood, forming the Nueva Mente Cooperative (NM New Mind Cooperative). Then, showing a great capacity for political negotiation, the ACAN, NM and the local Municipality of Morón launched a programme called Morón Recicla (Morón Recycles), by which the cooperative was contracted by the government to run the differentiated collection of waste. The agreement stipulated the loan of trucks and warehouses and the payment of a monthly stipend for each cooperative worker that represented 50% of their total income. The experience, developed between 2013 and 2015, was considered a successful case by key actors in the Government, academia, and among NGOs. However, due to the 2015 elections, the political sign of the local government changed radically and the program was abandoned, arguing the low volume of recovered waste compared to the cost this program represented to the municipality. The program's ending represented a shock for both organizations, as they had built an innovative schema of relation with waste management public policies in the Province of Buenos Aires. But even worse, a few months after, they suffered a fire that almost implied the disappearance of NM. In this context, two ongoing projects gained an unusual relevance. On the one hand, the 'New Mind goods' project, a productive space dedicated entirely to the crafting of household objects of recovered objects and materials. On the other hand, the launching of a Professional Training Center for the Recycling Craft, which delivers official certificates to their students. The program content formalized the knowledge elaborated in the cooperative related to the management of an enterprise dedicated to the recycling of materials.

Description of the innovation

The crafting of household objects by reusing recovered objects and materials takes place in a workshop located in the office of ACAN. The materials are preselected in NM and then are taken to the workshop. In general, they separate different types of plastic bags, printed papers, bottles of wine and beer and electronic and computer articles. Polyethylene bags and printed papers are used to make plastic plates with which they make wallets, lampshades, containers, aprons, among other household objects. The plates are made with a machine that uses "hot press" technology to consolidate the plates. Creative designs are achieved by combining colours and textures present in bags and printed papers. On the other hand, bottles are used to make vases and glasses. Both products are elaborated with a

machine designed and made in the cooperative that cuts several bottles at the same time. For their manufacturing, they used other machines and elements that had been discarded in the street. Finally, with electronic objects (mainly computers, monitors, etc.) they developed a repair and assembly workshop, which are then sold to individuals or donated to other cooperatives and CBOs.

Actors

The basic idea of the workshop emerged from the proposal of the NGO Waste for Life (US-Australia) made up of engineers who develop low-cost technologies to be transferred to waste pickers. In this case, the NGO visited Argentina for the year 2004, interested in knowing the phenomenon 'Cartonero'. There he made contact with ACAN and the Cooperative and donate a 'hot press' designed by them that costs a quarter less than the Chinese machines that could be obtained on the market. Other actors that collaborated in this process were chairs of the Faculty of Architecture, Design and Urban Planning (FADU-UBA) that arrived at the Cooperative by action of Waste for Life. The members of ACAN and NM dedicated themselves to learn the uses of the 'hot press' and to explore new potentials uses, achieving a high level of expertise. Currently the staff of Product NM involves 5 people, most of whom are young children of the waste pickers that form the NM cooperative. They produce more than twenty products that they sell through fairs and institutional orders. The income generated by this work represents between 50% of the value of a minimum wage, which they complement with the income provided from social programs.

Resources

The 'hot press' was donated by the NGO 'Waste for Life'. Currently the staff of 'NM Goods' involves 5 people, most of whom are relatives of the NM Cooperative waste pickers. They produce more than twenty products that they sell through fairs and institutional orders. The income generated by this work represents up to 50% of the value of a minimum wage, which they complement with the income provided from social programs.

4.1.3.2 CHALLENGES ENCOUNTERED AND STRATEGIES TO ADDRESS THEM

The main obstacle is related to the difficulty in finding marketing channels for the products they make. The demand for artisanal products made with recycled materials is low and the niches they can find are quickly saturate. They have had support from the municipal administration (previous administration) that bought several items to make institutional gifts. However, with the change of administration that channel was discontinued. They are currently exploring with relative success, the sale in a circuit of Social Economy fairs and online sales through social networks.

Timeline

The project started around 2004 with the visit of the ONG 'Waste for Life', but it really got consolidated around 2014 when the workshop started to operate continuously.

Changes and effects

The main effect of innovation is internal and for both organizations, in political and cultural terms, although not in economic terms. Its profitability is low and the main contribution focuses on the job creation for youth, living in poor neighbourhoods.

4.1.3.3 STABILIZATION OF THE INNOVATION

The prospects of selling in fairs and social networks are good. Its members point out that it is possible to advance in this way, however they also warn that the products are not of basic consumption, which in a context of crisis and recession like the current one, this can negatively affect them.

4.1.3.4 INCLUSIVITY OF THE INNOVATION

Even when the 'economic' results are not encouraging this innovation represents a clear contribution in terms of public relations and visibility. Through it they have been able to establish relationships with other NGOs, political officials, churches, etc., in order to share their view and actions about waste picking and the waste management system. In this sense, the value of experience can not be measured only in terms of the income that it currently generates. Another outstanding point is its articulation with the Professional Training Centre for the Recycling Office, contributing contents and practical experiences to the students.

There is tensions related to the fact that there are more children and family members of the cooperative's waste pickers who would like to work in the NM Product enterprise. However, due to its weak economy, it is not possible at this time to expand the number of people involved. In a sense, one might think that at first, the Product NM initiative was clearly driven by ACAN rather than the Coop NM. However, by incorporating the children of members of the cooperative as full members, it made the decision-making process much more shared.

4.1.3.5 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

The Product NM workshop is constantly visited by primary and secondary schools, by other waste picker cooperatives and CBOs. The horizontal transfer of the knowledge and expertise generated there is organized through articulation with the Training Program. As a result, several local ventures have been technically supported but the experiences were driven by neighbours who sought support to develop ideas related to recycling. The idea motivated other people to develop personal initiatives linked to recycling, but the experience was not replicated as a whole yet.

4.1.3.6 OTHER CHARACTERISTICS OF THE ORGANISATION INTERESTING FOR THE CASE AS A PROFILE

It should be noted that the composition by gender is important, since of the current 5 members, 4 are women. One of the members is a designer graduated from the University who was linked to the project from its origin. He is the one who has most actively worked on the technologies of production and design.

4.1.4 LEGAL FRAMEWORK FOR LARGE GENERATORS AT THE MUNICIPAL LEVEL

Name of the initiative: Cooperativa Jóvenes en Progreso

Location: Lomas de Zamora, Provincia de Buenos Aires, Argentina

Name of researcher: Santiago Sorroche

Type of innovation: governance (communities, companies, local governments, NGOs)

4.1.4.1 DEVELOPMENT OF THE INNOVATION

History of the waste picker organization

The cooperative is located in those neighbourhoods where waste picking is one of the main occupations of its inhabitants. Located on the left margin of the 'Riachuelo' that acts as the natural border between the City and Province of Buenos Aires, many of its inhabitants cross daily to collect recyclable materials in the most affluent and densely populated neighbourhoods of the capital city. In effect, many of these inhabitants belong to the cooperatives that reached an agreement with the BA City government. However, many others did not manage to enter the places available in that programme. Therefore, they decided to organize themselves into a cooperative to pressure the local municipality to replicate the model developed in the City of Buenos Aires. However, it was not simple to achieve this goal, as the municipal governments located in the Province do not see the collection of waste as a priority issue in their agendas (at least not as important as security and territorial ordering). But, departing from the OPDS regulations regarding Large Generators (LG) it was possible to explore the replication of these kind of norms but at the municipal jurisdictions. In this way the local government officers can intervene more actively in the construction of agreements between LG and waste pickers cooperatives, to guarantee the later a minimum flow of quality recyclables and the possibility of charging the LG for the provision of specialized waste management services.

Description of the innovation

The innovation focuses on the elaboration and sanction of a Municipal Ordinance that territorializes the specifications of the OPDS regulation. On one hand, it compels the LG to separate the recyclables and to design a management plan for the recyclable waste. On the other hand, it formalizes and registers the Cooperatives, allowing them to provide waste management services, supported by the local government.

Actors

Cooperativa Jóvenes en Progreso designed the regulations, later negotiated with the local government authorities (Municipality of Lomas de Zamora). They received advice from the Argentinian Federation of Cartoners, Carreros y Recuperadores (FACCyR), the Confederation of Workers of the Popular Economy (CTEP) and the University of Buenos Aires in this process.

Resources

The main resources mobilized were contacts at a political level that the Cooperative already had at the Municipal level, and others that the FACCyR and CTEP contributed at the provincial and national levels.

Rationales

Basically, it consists of an adaptation of the resolutions elaborated by the cooperatives within the framework of the OPDS. Innovation has to do with empowering the municipal level that can mediate between the cooperatives and LG located in their territory. As we noted earlier, the very idea of providing services to LGs is a derivative of the demand for recognition as a 'public service' that cooperatives in the sector are providing.

Challenges encountered and strategies to address them

The main challenges have to do with the reluctance of certain municipal officials to carry out actions that affect the interests of large economic actors. The main risk is to think that having approved the regulations is enough. It is necessary to develop a strong articulation between all parts to be able to put the regulation into practice.

Timeline

The OPDS resolutions were sanctioned at the end of 2013. An antecedent of municipal ordinance was sanctioned in the Municipality of Quilmes in 2016 and the ordinance in the Municipality of Lomas de Zamora in 2018.

Changes and effects

The main effect is to provide legitimacy and to strengthen the cooperatives in the district that are registered in OPDS as specialized service providers. The possibility of making contracts with LG is key to ensure the financial sustainability of the cooperatives.

4.1.4.2 STABILIZATION OF THE INNOVATION

The experience developed in Lomas de Zamora is working very well and now begins to be replicated in other municipalities.

4.1.4.3 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

Yes, as we mentioned the role of the cooperatives that participate in the OPDS discussions contributed collectively to this innovation, for example sharing the experience in the Municipality of Quilmes. The same at the level of the FACCyR/CTEP that drives the sanction of this type of regulations in other jurisdictions, even outside the metropolitan area of Buenos Aires (e.g. the city of Tandil, more than 300 km away). The ordinances are currently also being negotiated in the municipalities of Lanús and La Matanza in the metropolitan area. The cooperatives that work in each district are in charge of promoting these initiatives since they know the particularities of each district.

4.1.4.4 OTHER CHARACTERISTICS OF THE ORGANISATION INTERESTING FOR THE CASE AS A PROFILE

The cooperative Jovenes en Progreso is one of the few that has a high proportion of women in its composition and where they managed to assume leadership roles.

Photo 5: Meeting with members of the Cooperativa Jovenes en Progreso and authorities

Photo 6: Members of the Youth Cooperative in Progress before joining the Lomas de Zamora Deliberative Council to address the municipal resolution for inclusive recycling

4.1.5 ARTIFACT TO DISARM PET SIPHONS

Name of the initiative: Cooperativa Creando Conciencia

Location: Benavídez, Tigre, Provincia de Buenos Aires

Name of researcher: Sebastián Carenzo

Type of innovation: technology innovations (sorting)

4.1.5.1 DEVELOPMENT OF THE INNOVATION

History of the waste picker organization

The cooperative has a long history of providing differentiated collection service in private urbanizations or gated communities (locally known as 'barrios cerrados'). Most of its work is explained by the recovery of recyclables from household waste. Among the discarded objects is the disposable 'soda siphon', made with two different types of plastic and one part of aluminium. The cooperative developed a device to be able to separate the three components and achieve a more accurate sorting.

Description of the innovation

The artefact is made with recovered metals, which are welded to a pouch holder where the bodies of the PET containers are placed. And it consists of two steps. The first uses a metal ring that is welded on one of the corral edges, with which the polypropylene cap can be beheaded. The second step consists of a strip of sharp metal that acts as a guillotine to separate the PET body from the aluminium ring that closes the end. In this way, the three materials contained in the same container are separated and sorted.

Actors

The artefact was elaborated from observation and experimentation linked to the sorting process in the cooperative.

Resources

Discarded metal parts that were recovered as part of the daily work of the cooperative members and the welding machine available in the cooperative.

Rationales

The idea came from one of the members that was dedicated to classify PET containers. He told the president of the cooperative (Edgardo Jalil) and together they began to work on the design and assembly.

Challenges encountered and strategies to address them

They did not report any significant challenge.

Timeline

The development was carried out in 2012 and demanded a couple days of work.

Changes and effects

The innovation made it possible to achieve a more precise classification and thereby to improve the prices obtained by selling each material separately. They estimate that they get 20% more value than selling whole siphons. In terms of the cooperative, they emphasize that it contributes to the professionalization of their activity, a feature highly valued in the cooperative.

4.1.5.2 STABILIZATION OF THE INNOVATION

The artifact is currently in use.

4.1.5.3 INCLUSIVITY OF THE INNOVATION

The innovation has helped build an image of professionalization in the task.

4.1.5.4 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

Although the visits of other cooperatives show interest, they do not know of anyone who has replicated it.

4.1.5.5 OTHER CHARACTERISTICS OF THE ORGANISATION INTERESTING FOR THE CASE AS A PROFILE

This cooperative has a clear business profile.

4.2 SELECTED GRASSROOTS INNOVATIONS IN THE METROPOLITAN REGION OF SÃO PAULO, BRAZIL

4.2.1 CONTRIBUTION TO THE HUMAN DEVELOPMENT OF WASTE PICKERS

Name of the initiative: *Cooperativa Avemare*

Location: Santana de Parnaiba, S.P. Brazil

Name of the Researcher: Jutta Gutberlet, Solange Dias de Araujo, Ionara Pereira dos Santos

Type of innovation: Good governance for social inclusion and support

4.2.1.1 DEVELOPMENT OF THE INNOVATION

History of the waste picker organization

The cooperative originated from waste pickers working informally at the controlled landfill in Santana de Parnaíba. With the support of the local government (providing the space and equipment) the waste pickers received a working space and could organize into an association in 2000 and formalized into a cooperative in 2007. Since then they received support from different partners for capacity building and equipment, (*Fundação Alfaville, IPESA*[50]*, FUNASA, Instituto Ecoar)* and from industry (*Hurshley, CEMPRE, ABIPEC, TETRAPAK, TRICICLA*). In 2013, supported by *ECOAR* and *Rede Verde Sustentável*, Avemare began negotiations with the local government for a service contract for the collection of recyclables. In 2014, they signed the contract and since then the city pays 220 R $ / ton (60 US$) of recyclable materials sold and an additional 10% for maintenance of the cooperative space (e.g. electrical, roof, etc.). The average income per member is now between 1,200 to 1,300 R $/month (320 – 350US$). *Avemare* covers approximately 30% of the city area with door to door collection of recyclable materials. They also take recyclables from schools, restaurants and hotels, commercial businesses and government buildings and they collect electronic waste from businesses and industries. Currently Avemare has 82 members, of which 50 are women (7 women out of 8 members are on the board of directors). Most members are relatively young, between 18 and 40 years old. They collect 360 to 400 tons/month and sell 250 to 300 tons/month of materials. Today the cooperative has 3 presses, balances, glass crusher, PET crusher, a fork-lift, 2 bobcats, as well as 3 moving conveyor belts of 25 meters for sorting. The cooperative owns 3 trucks and shares additional 3 trucks with the recycling network (*Rede Verde Sustentável*). The many capacity building activities the members have been able to participate over time as well as the recognition by the local government and consequent higher income of the waste pickers were instrumental in promoting the innovation to invest in the human development of its members.

Description of the innovation

One of the main goals of Avemare is to promote social inclusion by offering low barrier jobs and to contribute to urban sustainability by providing door to door resource recovery. Avemare has defined

[50] Support to AVEMARE. http://www.ipesa.org.br/residuos-solidos/projetos/avemare/

human development for its members as a key target and they have prioritized human development actions for cooperative members and their families. It begins with providing fresh and healthy, nutritious food to the members; "*so at least once a day the people eat well"*.

The cooperative engages in social work and provides specific individual support (e.g. field trips, child support, social projects, financial support, etc.) and conflict resolution (between members or experienced by a member) during extraordinary, gender specific meetings. Regular general assemblies are conducted to minimize conflicts. If a member has a problem, we first try to solve it among the cooperative (*"we are kind of a mother, a psychologist…. Sometimes the person only wants a hug, a friend's shoulder to release, or asks for advice, and the cooperative is very welcoming about it ..."*.). *"Our biggest result is when we see life changing in the work of the cooperative"*. The cooperative has recovered several lives, people who were involved in drug trafficking and are now clean, working as members.

During the door to door collection waste pickers engage in community education and they also participate in environmental education programs at schools and pre-schools. Avemare also maintains a 2nd hand shop (Bazar), where they place reusable or repaired items (e.g. electronics) for low cost to the waste pickers. They are also a member of the MNCR.

Actors

Main actors are the leadership within the cooperative. Particularly, for the health component of the human development, Avemare receives support from a government occupational health and security agent, who is now working on a regular basis with them, making sure that medical exams and routine check-ups are done by the cooperative members. E.g. they help cooperative members schedule exams through the government's social assistance and health promotion secretariats.

Resources

The investment into capacity building of the waste pickers has increased the level of awareness and the skills of the waste pickers, particularly those in the board of directors, who are pushing for this innovation of furthering human development among the waste pickers.

Rationales

Redefinition of the waste picker from being socially excluded to citizens (recovering humans, citizens) through continuous education towards fostering solidary behaviour and cooperation. The social capital of the cooperative is employed to improve the quality of life of its members and to build social cohesion within the cooperative.

Challenges encountered and strategies to address them

Capacity building takes time and the participants have to leave their 'comfort zone' in order to apply the learned lessons (e.g. apply changes in work behavior and work equipment to address occupational risk prevention measures). There is still a lack of knowledge and awareness of many cooperative members related to the necessity to innovate (e.g. knowing the legislation and regulations that influence selective waste collection and recycling). Establish partnerships with different stakeholders (business, government, university, NGOs) for capacity building of cooperative members to increase their level of knowledge.

Timeline

While the innovation to actively invest in the human development of cooperative members and the wider community happened after many years of building the capacity within Avemare and with the better remuneration by the service contract with the city in 2014.

Changes and effects

High levels of satisfaction of members and low membership rotation. Low level of conflicts. The cooperative has effectively recovered the citizenship of several new members (ex-prisoners, ex-addicts).

4.2.1.2 STABILIZATION OF THE INNOVATION

The described innovation is still practiced by the cooperative and a larger number of waste pickers are benefitting from this innovation.

4.2.1.3 INCLUSIVITY OF THE INNOVATION

Yes, this innovation particularly targets those that have been historically marginalized and stigmatized by society. Avemare is open for new waste pickers who want to become part of the cooperative. Often these individuals, who can't find another job, have addiction or other health problems and the cooperative can help addressing these issues. Some of the waste pickers who today have a strong voice within the cooperative, in the past were also most vulnerable; hence yes, marginalized individuals and groups are involved in this initiative.

Photo 1: Members of *Cooperativa Avemare* during capacity development activity

4.2.1.4 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

Yes, the cooperative takes part of the waste picker cooperative network *Rede Verde Sustentável*, and in their regular meetings experiences are shared and challenges discussed. Avemare also actively helps other cooperatives who are not yet or newly established to address their challenges. They also learn from other cooperatives (e.g. they have learned the remuneration by production system through Coopervivabem). Avemare sees it as their mandate to help level the various groups, to diminish the

disparities (*nivelar os grupos*). More research needed to be done to be able to measure the impact of the diffusion of this innovation.

4.2.1.5 OTHER CHARACTERISTICS OF THE ORGANISATION INTERESTING FOR THE CASE AS A PROFILE

The success of this group is also linked to the management decision to expand environmental awareness activities in the local community, if the quality of the door to door selective waste collection falls and if the separation at the source is not as good any more. This is a continuous effort to educate the population. The objective of the cooperative is to provide the collection service in 100% of the city (so far, they are covering only 30%).

4.2.2 ALTERNATIVE ORGANIZATION OF WASTE PICKERS (INCLUDING CART PUSHERS)

Name of the initiative: *Associação Nova Glicério*

Location: São Paulo – Centre

Name of the Researcher: Jutta Gutberlet, Solange Dias de Araujo, Cleiton Ribeiro Emboava

Type of innovation: Alternative form of organization and internal management

4.2.2.1 DEVELOPMENT OF THE INNOVATION

History of the waste picker organization

Since 2008, many waste pickers in the city centre were working collectively under one of the city's viaducts[51]. Initially they were dependent on the city's social assistance program. The space below the viaduct was given to the waste pickers by the municipality of São Paulo together with promised funding for infrastructure and equipment. In 2013, the waste pickers (and cart pushers) independently (without government assistance) created the association as a philanthropic project. The association was set up with many elderly and illiterate individuals, who were socially and economically excluded, making a livelihood as waste pickers, often gaining a minimum wage or less. The creation of the association was a social and political project, with the objective to strengthen the waste pickers and cart pushers in the central region of the city and to provide a space and structure for them to help each other. Initially the members received training at the waste separation plant (UTC *Unidade de Triagem Catador*), so they could later work in the partially automated mega recycling station (*megacentral*). But this transfer to the megacentral never happened.

[51] Waste pickers started to organize under major viaducts in the city centre, as a result of the creation of a municipal policy for social inclusion of waste pickers in the region *Baixada do Glicério*, by the mayor of São Paulo Gilberto Kassab, in 2006 (Decree No. 48,378).

Today there are 115 members, of which 68 are men and 47 women. Among them a total of 70 push cart drivers *(carroceiros)*, of which only 2 are women. The average age is between 40 and 79 years. The rest of the women (45) work in the separation of the material only, not in the collection. The board of directors is composed of 6 men and 1 women, being the leader a man.

The association benefitted from the project *Pimp My Carroça*[52], which started out as an arts-based project with cart pushers and has become a social movement to make waste pickers visible, to promote their self-esteem and to create awareness among society about the cause. This project has helped them with the maintenance of their carts. The association is also part of the Waste Pickers committee of São Paulo and they are a member of the recycling network *Rede Paulistana.*

Description of the innovation

Working individually and yet collectively is not easy. Providing an umbrella for autonomous waste pickers and building their capacity to improve their working conditions and outcomes is the main social innovation this association has made. The recyclers remain autonomous in the definition of their collection routes, the timing and the quantities and qualities of different materials collected, by way of using their own (though very heavy) push carts. The association provides a collective space (bathrooms, kitchen, storage) and yet allows members to work in their individual spaces, the booths, which are equipped with a table. They can work alone or involve other workers (*diaristas*) in the separation of the materials. The individual waste pickers sell their material collectively through the association. The idea is to bring individual waste pickers together into an organization, that allows them to continue working on their own schedule, with their own clients, doing the routes they are accustomed to work with their own cart. The association provides the flexibility the recyclers want

Photo 2: Individual workspace for members to separate materials

[52] For more information on the project see: http://pimpmycarroca.com

and need and at the same time gives them the advantage of having a space with equipment, to separate and store and to sell the material collectively.

Actors

At the beginning a social worker form the local government was one of the main actors supporting the strengthening of the association. The National Recyclers' movement (MNCR) was also instrumental in providing capacity building on cooperatives and other important topics related to social and political organization. The board of director (7 people) and the members of the association (115) are

Photo 3: Load of an individual cart pusher

key actors in constantly reinventing the association, adjusting to new challenges. The association receives legal support from the Federal Public Defender (*Defensoria Publica Federal*) and they have the support of the local community, the people of *Glicério*.

Resources

Part of the promised funding from the city of São Paulo was disbursed and used to pave the floor of the space, and to build bathrooms and individual booths for material separation. The rest of the money and the promised equipment never arrived.

Today the association is equipped with individual boxes that have a little table for material sorting, as individual work spaces. The association further owns 1 press and 2 balances and some very old pick-up trucks (only 2 are working). Each member separates and sells approx. 3 tons / month, which can amount to a total of 300 tons of material separated monthly by the association.

The average income is more or less a minimum salary and a half (between 937.- and 1,405 R $/ month) (250.- to 372.- US$). The prices change seasonally and depending on the season and the type

of material the values of the material varies. The pay for material separation only is up to 70.-R$/ day (15.5 US$).

Rationale

In the city centre push cart drivers have historically been doing the work of collecting recyclable materials and selling them to middlemen. The workers differentiate themselves as push cart drivers (*carroceiros*). The vast majority of the members of the association (95%) has their own fixed collection routs. Working with push carts means doing differentiated work, since the quantity of materials collected and carried in the cart can vary significantly. There are waste pickers who carry up to 600kg per load in their carts. Usually, they do 2 loads per day. They collect at individual households and apartment buildings, from garbage placed in the streets and from schools, hospitals, restaurants, hotels, supermarkets, offices, small businesses and in government buildings. They do not have formal written contracts with any of their clients.

The innovative aspect of this case is that the association allows the individuals to continue with their habitual work, providing an individual space for material separation, instead of sorting in the street, while allowing for collective decision making and shared commercialization.

Challenges

The biggest challenge currently is the threat of being expelled from the location. The city's program of beautification and gentrification of the old city centre is pressuring the association to move location. In 2017, the government brought shock troops, machine guns and civil police in order to remove the waste pickers from the two groups that are operating below viaducts (*Associação Nova Glicerio* and *Cooperglicerio*). The City Hall wants to dislocate the group to the neighbourhood Armenia which is far from their habitual collection points and routs. Currently, the recyclers have established partnerships with many of their clients in the old city centre and near the business centres Av. Paulista and the Jardins. The waste pickers see reason for the removal as being *"...people want the waste pickers to be far away from them, out of sight".* They seek partnerships to develop new social technologies. Look for ways to develop new machinery.

Time line

In 2008, individual cart pushers organized as a group and become formalized as association in 2013. Since then the group has expanded and strengthened their activities.

Changes and effects

The members of the association have been able to implement an alternative form of organization for autonomous push cart drivers and waste pickers. Their collective organization provides them with social assistance and specific infrastructure for individual collection and sorting. In addition, many members get involved in awareness building among the local population. The association performs educational work with the surrounding community and with individual clients. E.g. one of the waste pickers collects recyclables for over 14 years at a restaurant in Largo do Arouche. He has educated every one of the establishment to separate materials correctly and to not mix them with waste. A few months ago, the owner of the establishment told him that the correct material separation actually saves him around 1,600 R $ / month (423.-US$).

4.2.2.2 STABILIZATION OF THE INNOVATION

The association is currently weakened by the threat of removal through the current municipal administration. However, the resistance has crystalized the local community as a partner who is defending the association.

4.2.2.3 INCLUSIVITY OF THE INNOVATION

The association is open for new members. Anybody is welcomed if they bring experience as a push cart driver, or if they have been recommended by an existing member. The only pre-requisite is to be able to collaborate and work towards collective goals and to value one's own work.

4.2.2.4 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

The association is part of *Rede Paulista* and shares their experiences with the nearby cooperative Cooperglicerio, who has a similar history and trajectory, but is a cooperative and does not allow individual work schemes, as the association does.

4.2.2.5 OTHER CHARACTERISTICS OF THE ORGANISATION INTERESTING FOR THE CASE AS A PROFILE

The leader of the association is very proactive in acquiring and disseminating new knowledge, e.g. related to environmental education with school kids or the technology of bio-digestion of organic waste.

4.2.3 CONTRIBUTING TO HUMAN DEVELOPMENT OF WASTE PICKERS

Name of the initiative: *Movimento Nacional de Catadores de Materiais Recicláveis MNCR* (National recyclers' movement)

Location: São Paulo Brazil

Name of the Researcher: Jutta Gutberlet and Solange Dias de Araujo

Type of innovation: Grassroots pedagogy and education

4.2.3.1 DEVELOPMENT OF THE INNOVATION

History and description of the innovation

In 2006, the methodology '*from catador to catador*' began to be observed as pertinent for the work with waste pickers. Educational material was developed to form trainers. A training school was created in Ceará (CRAS content). This school produced several booklets and videos as teaching material. MNCR also participated in the production of a guide on how to create a cooperative.

The approach of 'popular recycling' *(reciclagem popular)* which includes the control of the recycling chain (processing of materials); collection technology; organization of the waste pickers, was initiated under the *National Program of Investments in Popular Recycling* - PRONAREP, under the Ministry of work. Popular recycling is recycling done by the waste pickers, in associations and cooperatives. The PRONAREP program introduces a fund to support waste pickers' organizations, organized on different levels. The program should provide an alternative to public bids by private companies. The fund should further support the small associations on open dumps as well as those that are selling collectively in organized networks. The program introduces a structural financing policy for the organization of waste pickers. This funding support is targeted to small associations and also to large cooperatives of waste pickers. This support aims at strengthening the growth of the waste pickers for the development of the productive chain, making it solidary and self-managed. This program articulates the different social policies of education, health, housing, eradication of child labour and social assistance for the entire population, regardless of their level of organization. This program focuses on the transformation of the recycling chain, as a source of inclusion and solidarity. It includes the transformation of some materials, to make strategic improvements for the industry or to produce new products.

Challenges

Funding cuts due to change in the recent federal government.

Timeline

2006 – Initial capacity building "training the trainers"

2011 – Educational project with the Ministry of Social Development allowed for nation-wide capacity building of waste pickers by waste pickers.

2014 - During the opening of the National Conference on Technologies for the Inclusion of Waste Pickers, held at the University of Brasilia, MNCR officially submits the proposal for the National Program for Investment in Popular Recycling (PRONAREP) to the Minister of the Environment.

Changes and effects

Widespread capacity building and empowerment of organized waste pickers. Increased numbers of waste picker organizations. Knowledge co-creation and knowledge dissemination. Increased level of political activism among waste pickers. Advances in waste picker organizations negotiating contracts with municipalities. Participation in multiple events and dissemination/strengthening of popular recycling

4.2.3.2 INCLUSIVITY OF THE INNOVATION

Until recently the movement's leadership was primarily male dominated. In 2016, a secretariat of female waste pickers was created under the National Movement, increasing the visibility of female waste pickers.

4.2.3.3 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

MNCR participates in numerous events within Brazil and outside, disseminating ideas and building the capacity of other waste pickers.

4.2.4 BUILDING NETWORK COOPERATION AND COLLABORATION

Name of the initiative: *Rede Catasampa*

Location: São Paulo, Brazil

Name of the Researcher: Jutta Gutberlet and Solange Dias de Araujo

Type of innovation: Building excellence in service provision and certification for resource recovery

4.2.4.1 DEVELOPMENT OF THE INNOVATION

History and description of the innovation

The network emerged initially with only a few cooperatives (Cruma, Cooperalto, Ares) from the Alto Tiete area (initially with the municipalities of Poá, Cruma, Biritiba-Mirim, Salesópolis), in the metropolitan region of São Paulo. These cooperatives had identified the need to work together to overcome the local intermediaries to try to get better trading values for their materials. In 2006, the network was created and over time other cooperatives joined. Today, Catasampa is a wide-reaching network of a total of 20 cooperatives (approximately 600 members), covering 11 municipalities (in the "Alto Tiete" region, Guarulhos, São Paulo, as well as some at the southern coast (Santos, Itanhaem, Mongagua).

Catasampa network was born out of the National recyclers' movement (MNCR). Many of the leaders of the network are also leaders in the movement. Catasampa network is an arm of the national movement and all the cooperatives that are part of the network are affiliated to the movement. The political negotiations and articulations with the local governments are made by the national recyclers' movement MNCR.

Description of the innovation:

Since 2006 the network Catasampa has expanded its capacity and activities significantly. They are represented by waste pickers, who are in charge of the governance of the network they are the ones

that take decisions. The 20 leaders of Catasampa meet regularly (every week or two week, or at least once a month) to exchange experiences, to pass information and to discuss the market updates and business opportunities issues. These meetings are also a form of capacity building. The network also runs monthly meetings with the leaders of the cooperatives to help them to be better structured. Over a very short time span, the past five years, many of the waste pickers, members of the network, have been empowered and strive for self-management. They know how to handle computers, use programs, sometimes complex software, they work with invoice generation and many other very specific duty applications. Most impressive is the level of service provision to other cooperatives and to clients as well as the documentation of proof for the destination of the recyclable material for the client by Catasampa. The use of social media has been instrumental in the communication among the waste pickers.

Funded through Fundação Banco do Brasil, Petrobras and others, the network has provided many different professional training sessions to its members (particularly through the federal government funded *Cataforte* project). The network provides continuous training in: cooperativism, work safety, marketing, business, administrative management and solid waste management politics.

The network provides a destination report to waste generators, stating the quantity of materials being separated and sold by the network for recycled. This is particularly relevant to industries working with ISO 14000 certification. These partnerships with companies require a much higher level of organization of the cooperatives. Finally, Catasampa buys particular items for several co-operatives or for the network, because the scale provides lower prices (e.g. uniforms, equipment).

Actors

The Network is governed by a team of 20 people (including fiscal advisory board and deputies). The board of directors is composed only of waste pickers and is supported with external technical staff (Communication, commercial, logistics, administrative, project). The management is divided between: communication sector, logistics sector, commercialization sector and administrative sector.

Resources

Since 2006, Catasampa was supported by intensive capacity building and training funded through the federal government (project *Cataforte I, II, III* since 2003*),* in addition to funding from the federal Secretariat for the Solidarity Economy (SENAES) and Petrobras.

To assist with the collective commercialization the network owns a warehouse (located in Jundiapeba) for collective commercialization of ferrous and non-ferrous metals, paper, cardboard, glass, and electronics. Catasampa uses another space, owned by the city hall of Mogi das Cruzes*,* a triage centre, where 37 waste pickers work. While the initial objective of the network was collective commercialization, today the network also tackles other areas, such as: training, collective procurement for cooperatives, service provision.

Catasampa created the *Catasampa Institute* (http://catasampa.org/instituto/) focuses on fundraising, execution of social projects, provision of assistance and services (e.g. to help in the implementation of municipal selective collection with a waste picker cooperative, support on how to create a cooperative, how to include the waste pickers in the municipal waste management).

Rational

A network does not have the same structure nor the same capital as a private company. It is a social business that has a much less comprehensive area of operation. The network has to act like a small company, that is coming on the market, that is growing. Catasampa is following a vision, but not an unrealistic dream.

Catasampa understands that surviving only from the sale of material as well as maintaining the structure of a triage centre with vehicles, trucks, workers and technical assistance is not possible anymore. The network has individual clients (e.g. SESC Pinheiros, Conbras Engenharia, apartment buildings, gated communities and other businesses). Catasampa collects their recyclable material and delivers it to those cooperatives of the network which do not have enough materials.

Catasampa network sees that today the provision of selective waste collection services is essential and needs to be paid for. Hence Catasampa provides services to other cooperatives on accounting or legal advice, etc. to help them comply with the law. Catasampa also helps the coops to become structured and well organized to receive a growing number of materials for recycling and to be able to provide reliable data as expected by the companies. The administrative side has always been a bottleneck in cooperatives, since it is necessary to keep the cooperative documentation in order and up-to-date. Cooperatives have to have their certificates up to date, they have to keep up with their current accounts, this remains a challenge for many cooperatives, the administrative and fiscal issues. Here is where Catasampa supports the cooperatives.

The provision of service to the city hall or companies is an important income source for the existence of a network. This also means participation in projects, to obtain sponsorship or partnerships. Often, a cooperative on its own does not have the necessary structure and organization to provide services to the city. Catasampa helps build the capacity. The network provides contracted services of sorting and destination of solid waste in the municipality of Mogi das Cruzes (SP). The city has implemented household collection of recyclable materials. The collected material is handed over to the network at the city's triage center. Two years of service provision for the city of Mogi, under the program "*Recicla Mogi"*. The service has been so successful that despite a change in the local government the program continues to grow. The city administration did see this program going well and being interesting to the municipality, therefore they maintained it. Catasampa has demonstrated competence and the fact that they have the capacity to provide that service. For Catasampa this has meant: *"a first challenge to get the door open, and a bigger challenge to be able to provide the service with the quality promised"* (J. Ruschel).

Challenges

Currently Catasampa is focusing at establishing partnerships with the private sector, supported by the national solid waste legislation (*Política Nacional de Resíduos Sólidos – Law # 12.305/2010*), which demands for the private sector (Manufacturers, Importers, Distributors, Wholesalers, Retailers) to implement the reverse logistics of the packaging of its products for the beginning of the production chain, preferentially with the inclusion of waste pickers. Some of these partnerships already exist, due to sectoral agreements, but there are companies that do not have direct investments in cooperatives and Catasampa sees the opportunity for this path. The following are the areas which have made Catasampa a driver for social innovation.

Timeline

2006 formation of the network Catasampa

2015 Contract with the city hall (municipality) of Mogi das Cruzes

Changes and effects

Increased capacity of cooperative members of the network with more contracts established between the cooperatives and cities or businesses. Savings due to collective procurement. Continuation of the contract for selective waste collection between 2 government periods. Provision of selective collection of recyclables service to private companies. Special preparation for *reverse logistics* and proof of destination. Recyclables are send directly to the scale of the recycling industries. Support of the network for its affiliated cooperatives, with the availability of legal and accounting advice, acquisition machinery and equipment, in addition to capacity building.

4.2.5 CONTRIBUTING TO HUMAN DEVELOPMENT OF WASTE PICKERS

Name of the initiative: *Rede Sul*

Location: São Paulo Brazil

Name of the Researcher: Jutta Gutberlet and Solange Dias de Araujo

Type of innovation: Legal and administrative support to organized waste pickers

4.2.5.1 DEVELOPMENT OF THE INNOVATION

History

Rede Sul is a network of cooperatives, a 2nd degree co-op also termed a cooperative of cooperatives. Today 13 cooperatives are affiliated to the network, covering the south of the metropolitan area and the city of Campinas, approximately 800 waste pickers. The network was formalized in 2012 to sell directly to the industry and to thus avoid middleman or scrap dealers. The cooperatives in this region were highly dependent on the middlemen, who keep prices low. Sometimes middlemen provided cooperatives with equipment, creating vulnerabilities and dependencies. Today scrap dealers pay R $ 0.43/kg for cardboard and the industry pays R $ 0.50/kg. The network sells to the industry and retains R$ 0.02/kg, which goes to maintaining the activities of the network and funding the salaries of the network support staff. While the founding 13 coops do not have to pay the affiliation fee of 1000.-R$, new coops wanting to associate have to pay the fee, but they can do that over time and through material.

Description of the innovation:

The network helps maintain a high level of quality in the separation[53] work, which is crucial for selling to the industry. In addition, it supports associated cooperatives with administration and legal issues and it provides equipment to the cooperatives (e.g. computer, press, balance). The network got funding from *Abihpec* (Associaçao Brasileira da Indústria de Higiene Pessoal, Perfumaria e Cosméticos) and later *Pepsico* (they hired *Gaia Social*, an NGO that manages these projects). With that funding the warehouse was reformed, a truck was bought and it allowed for R $ 120,000.00 working capital of the network. The network further provides capacity building and technical training (e.g. techniques for handling special materials, reduction of the quantity of none recyclable materials, etc.); provision of services (e.g. quality control at the Megacentral Sul).

Rede Sul provides technical assistance to cooperatives and to the city's mega recycling centre. The assistance is to improve the sorting quality and efficiency of the recycling process. Sometimes capacity building happens within one of the coops affiliated to the network. The network also provides continuous assistance to all coops associated on legal, accounting and administrative issues.

The network researches for alternative solutions for materials that reach the cooperative but are not recyclable. In partnership with research institutes (University of São Paulo, USP) they try to find a niche for those materials. As a network, they also have more bargaining power to negotiate a better remuneration for materials not yet recycled, but can be provided in a larger scale.

The network helps minimize rejected material (currently at 16%). The main part of the rejected material is not recyclable or is organic (63%), and only a small proportion is not captured as recyclable, because it is too small and fractioned into little pieces. However, the network is aware of the necessity to capture these small materials as well.

The network and its associated cooperatives aims at recovering people who are at the margin of society, that can't be employed easily on the regular market, are discriminated against or are immigrants, refugees, expats, ex-prisoners or drug addicts (e.g. from Cracolandia). The network has started a project to improve the conditions specifically for LGBT; to create awareness and open the doors of the cooperatives offering work to these marginalized groups (*Coopere-centro*, e.g. is already supporting LGBT and *Cooperativa Uniao de Itaquera* is receiving many expats).

The network's collective commercialization improves the economic returns for the waste pickers. Their income has improved from average $ 800.- (215US$) to up to $ 2,000.- (536US$). This shift facilitates changes in life style resulting in better schooling for the children, access to transportation, etc.

The network uses the FAT[54] to pay for education of some members. E.g. *Carioca* took a university degree in cooperativism and management at Unisa and *Helio* took an environmental management course at the university; Jo is educated in logistics management; *Nicolas* finished high school and wants to go to college. Every cooperative of the network is now investing in education of their members.

[53] An automatized classification machine can not differentiate between PAD and PEAD plastics; but catadores can.

[54] The FAT is a special fund employees and cooperative members pay into the business or cooperative. The fund is of an accounting and financial nature, linked to the Ministry of Labor - MTb, destined to the cost of the Unemployment Insurance Program, the Salary Bonus and the financing of Economic Development Programs.

The network facilitates presentations of waste pickers on management issues of recyclables, at schools (*Estacio, Colegio Santa Maria*) and universities, at organizations (*Senac, Senai, Sescs*) and industries (*Guarana Antarctica*).

There are many opportunities in recyclable waste and there is a lot of residue on the market, you just need to collect it. The network is evaluating the opportunity of collecting automotive oil from gasoline stations for the production of biodiesel (technology and experience already exists with cooking oil). This residue has a value, of $ 0.18 today, but with increased quantities the price goes up to $ 0.75 (Eco Plampas).

Actors

The network is composed of 1 president (*Carioca*), 1 alternate (*Lorisvaldo*), 1 advisor (*Rebecca*); 1 quality manager (*Everton*) and 1 responsible for commercial contacts (*Neia*). *Rebecca* is a full-time staff, she keeps quality control of the production and also maintains the social media, website.

The waste picker *Dona Margarita*, works in the reception of the material and is in charge of quality control of the incoming material for collective commercialization. Each associated cooperative also has a member in charge of quality control. If material is contaminated, the network opens the bale and separates the contaminated material and redoes the bale, to guarantee high quality.

Photo 4: Concentrating materials at Coopercaps for Rede Sul

Rational

The network researches for alternative solutions for materials that reach the cooperative but are not recyclable. In partnership with research institutes (University of São Paulo, USP) they try to find a niche for those materials. As a network, they also have more bargaining power to negotiate a better remuneration for materials not yet recycled, but can be provided in a larger scale.

The network helps minimize rejected material (currently at 16%). The main part of the rejected material is not recyclable or is organic (63%), and only a small proportion is not captured as recyclable, because it is too small and fractioned into little pieces. However, the network is aware of the necessity to capture these small materials as well.

Challenges

Among the major challenges lies the adaptation of the municipal legal framework currently in place facilitating the work of collecting separating and commercializing recyclables by cooperatives. Coopercaps, affiliated to the network has had a lost labour court case from a former member, which made the cooperative loose resources. Rede Sul has regular bi-monthly meetings to discuss issues, to plan, to inform and to learn from lived experiences of the cooperatives.

Timeline

2012 – Creation of Rede Sul (13 members)

Changes and effects

Increased efficiency and quality of materials for better pricing. Higher income for the members. Increased level of education amongst the leadership of the cooperatives.

4.3 SELECTED GRASSROOTS INNOVATIONS IN MONTREAL AND VANCOUVER, CANADA

4.3.1 CONTRIBUTING TO SOCIAL INCLUSION AND IMPROVED LIVELIHOODS OF BINNERS

Name of the initiative: *Les Valoristes*

Location: Montreal, Canada

Name of the Researcher: Jutta Gutberlet, Marica Vazquez Tagliero**,** Dare Sholanke

Type of innovation: Social inclusion and support

4.3.1.1 DEVELOPMENT OF THE INNOVATION

In Canada waste pickers or informal recyclers are called binners. *Les Valoristes* is a grassroots initiative for binners, a cooperative, based in Montreal, East Canada. It was founded in 2012 by a group of 5 people that were upset with the possibility of the abolishment of the refund system in Quebec, and the turn to curbside recycling. This policy change was to the gross disadvantage of the local waste picker community. There is no other group that works for/with binners in Québec. The number of binners in Montreal is estimated to be 2,000; and Les Valoristes has worked with approximately 400 different binners over the past years. Most of the binners that are in contact with Les Valoristes face barriers entering the job market, have disabilities and have experienced discrimination both verbally and through signs.

The aim of the cooperative is to create awareness about the social environmental, and economic impacts of binners, and to give them a voice and power to address the problems and complaints they face in their everyday work. This includes improving the working conditions (services, awareness, education) and promoting social inclusion (social recognition - trust). At the environmental level the aim of Les Valoristes is to increase the recovery of recyclable containers (higher quality source sorting, better quality material for higher value-added recycling) and to stimulate environmental awareness (waste reduction, effective recycling). The cooperative also aims at improving the economic conditions for this population by increasing their income (avoiding begging / illegal activities) and at indirectly reducing the costs of municipal waste collection. The overarching societal aim of Les Valoristes is being a "bridge builder" between worlds that ignore each other.

Les Valoriste helps binners access capacity building activities, and they organize networks and collaborations with local residents, governmental authorities and/or the private sector. Finally, Les Valoristes is part of an integrated strategy to reduce urban poverty and environmental pollution. As the first bottle depot for returnable containers in Quebec, Les Valoristes serves as a model and pilot project for potential multiple deposit points. Since 2014, the cooperative operates a bottle depot under a bridge and thus is unable to operate all year round, due to the lack of protection from the cold winter. Currently members improvise during the winter, by storing the bottles on their private spaces (balcony). Les Valoristes is engaged in finding a permanent and covered space for sorting and stocking operations. During the warmer season binners collect from businesses donations, and do also innumerable presentations in different institutions to sensitize the public about binners and binning.

Les Valoristes is concerned about the current refund and recycling legislation in Quebec, which dates from 1984, and by then many of the beverage containers that exist today didn't exist. Only 55% of the containers in circulation today are refundable and thus only a fraction is recovered. While the provincial Government mentioned to also include water bottles and proposed to raise the *maintenance fee* from 0.02$ to 0.03$ per unit, the change is still to be seen. The *maintenance fee,* is an agreement between beverage producers and the retail in Quebec, similar to the recycling fee that bottle depots receive for managing beverage containers. Producers or supermarkets do not necessarily have to pay the *maintenance fee* to Les Valoristes, which could be a funding source for the cooperative.

There is a strong lobby in Quebec that does not support binning and is opposed to changes in the current refund system. This group has a strong influence on the sector, causing the interruption of private funding from a local beer company in support of Les Valoristes ($10.000 per year from 2014 to 2017). Potential sources of funding for the coop include the City of Montreal, a Co-op bank, and foundations.

Description of the innovation

To organize autonomous Binners, who belong to the most vulnerable part of society and are usually economically and socially excluded represents a unique social innovation, in benefit of the community and the environment. The co-op *Les Valoristes* served over 400 different binners since 2014 during the various summer temporary depot projects until 2017. The coop has now 45 full members (those who paid $10 membership fee) and 29 of them are binners. The number of women among the Binners is increasing, though still small – currently at 15% from 5% in 2017.

Photo 1: Volunteers and Binners organizing events (Source: 2015 Report Les Valoriste)

Under *Les Valoristes*, a group of binners has been trained in sorting (within the co-op), those interested (50) have also been sent to partnering organizations to learn computer and other skills, during weekly interventions. Les Valoriste also refers their depot users to several social services, including food banks.

Because of the work of Les Valoristes, there is more public awareness about binners and the media has covered binners frequently. Over 10 different binners did testimonials in TV or radio shows and for newspapers. Their stories tell about the importance of binning in their life, the difficulties they live through while binning, and the importance of the coop. A significant number of bottles and cans gets

collected through the binners, even those cans that are crushed and usually not refundable, are recovered with Le Valoristes. In 2017, 20% of the recovered containers (80,000) were crushed aluminium and plastic containers.

Timeline

2005 - *Consigne Project* Launch: 5,000 bottles were collected.

2008 – First meeting with United We Can, Vancouver

2010 – Visit to the Cooperative Cooperlazero in São Paulo, Brazil

2012 – Creation of the cooperative Les Valoristes

2013 – Les Valoristes receives 4 awards highlighting the recognition of the importance of the socio-economic dimensions in the work of the cooperative with Binners. The awards also demonstrate the interest for the proposed innovative solutions. Consecutive awards won in 2014, 2015.

2017 – Numbers of members is steadily increasing

Effects as a result of the social innovation

Increase in public awareness about the binners through the media.

The municipal government has accepted to start a 'participatory garbage project' and help get a permanent space for their operations.

4.3.2 CONTRIBUTING TO SOCIAL INCLUSION OF BINNERS

Name of the initiative: Binners' Project

Location: Vancouver, Canada

Name of the Researcher: Jutta Gutberlet, Dare Sholanke, Gabby Korcheva

Type of innovation: Social inclusion and livelihood support

4.3.2.1 DEVELOPMENT OF THE INNOVATION

Binners' Project is a grassroots project based in the Downtown Eastside neighborhood of Vancouver, a particularly socially problematic area of the city with a large highly vulnerable population. Binners' Project comprises of a group of binners, aided by support staff, dedicated to improving their economic opportunities and reducing the stigma they face as informal recycling material collectors. The project was founded in January 2014, with Ken Lyotier at its heart. Ken was also the founder of the *United We Can*, a charity bottle depot for the binners.

Binners' Project is a project of Tides Canada, a national Canadian charity. Over the past few years, the Binners' Project engaged over 300 binners through diverse activities and initiatives. Binners' Project

is a community led-initiative and thus is also aimed at community and capacity-building, economic inclusion, public awareness raising, waste reduction, and pilot projects on informal employment.

Binners' Project works closely with over 40 non-profit groups and government entities (including SFU Radius, UBC Learning Exchange, the City of Vancouver, Metro Vancouver). Those partnerships range from one-time only projects, to a significant part of the project's activities.

A primary tool for the project has been the public representation of binners and awareness-raising. They provide binners with a uniform and logo, branded communications, including business cards, identification cards, informational handouts, and signs. Binners actively run and participate in public waste education at events, back-of-house recycling sorting, bottle pick-ups. They also inform consultations, go to conferences, and speak on panels and in front of City Council to communicate to the public about their work. Promoting access to refundables, public recognition of binning, and accessing meaningful economic opportunities for binners are some of the long-term goals of the project.

Photo 2: Binners in Vancouver, British Columbia (Source: Binnersproject.org)

Description of the innovation:

Weekly meetings: Every Tuesday from 5:30 to 6:30pm, Binners' Project hosts a meeting for binners, to plan and organize activities, to exchange information, and to socialize. At the meetings, binners discuss common goals, project updates, and invite guest speakers from local organizations to discuss issues that impact on binning. In 2017, Binners' Project ran 52 weekly meetings.

Binners' Project holds specific workshops for binners on different themes. E.g. training in sorting and reducing risks.

The 'Back-of-House Waste Sorting' program is for local businesses and residential buildings to provide high-quality environmental stewardship of recycling by the binners. Binners are provided with T-shirt and caps, as well as ID badges with their names and the logo of the project, to formalize their business relations with the clients. As an example, Binners' Project diverted 375kg of waste from the landfill from just one of the buildings they provide service, in 2017.

Other business opportunities are sought out by binners themselves or provided through 'Bottles and Cans Pick-Up'. In 2017, Binners' Project members collected 141,990 bottles and cans, generating $10,912 in revenue.

The 'Coffee Cup Revolution' is a once a year event where binners receive a 5 cents refund on used paper coffee cups. The objective is to demonstrate what a coffee refund system can achieve as well as to promote open dialogue about how binning can support green communities, and vice versa. In 2017, 210 binners collected 53,783 cups off Vancouver streets in just 3 hours. Parallel to the depot, binners pair with community leaders to co-facilitate open discussions between binners, planners, organizations, and the public on a variety of topics related to green, inclusive economies.

The 'Binners' Hook' is a device that can be installed in the laneway to facilitate the separation of refundable materials by homeowners. Thus, residents engage with nearby binners by hanging bottles, cans, and other objects of value in bags for easy and safe pick-ups.

The 'Universal Cart Pilot', is about grassroots, purpose-built carts for binners created to improve their efficiency, to reduce risk of injury, to improve binners' relationships with police, business owners, workers, and residents in their community, concerned over the carts' origins. In January 2018 field testing of the carts began.

Timeline

2014 - Creation of Binners' Project, inaugural Coffee Cup Revolution in October

2015 – Binners' Project started going to events to provide waste and recycling education

2016 – Public Waste Education program starts to take off, Binners' Hook spreads to local neighbourhoods in Vancouver

2017 – The Universal Cart pilot program is born. Public Waste Education grows 3-fold in size, engaging over 70 binners. Binners' Project grows its binners staff team. The Binners' Project generates total $109,200 in honoraria and wages to binners.

2018 – Universal Cart Pilot goes into development stage, while social enterprise-modeled programs continue to grow. Binners' Project continues to hire binners onto its staff team.

Effects as a result of the social innovation

"I've joined Binners' Project because it helps the public understand that binning is an important resource for many people that are hard-working and good people" (Michael, a binner)[55]. Effective public intervention e.g. with the 'Coffee Cup Revolution'. 210 binners collected 53,783 cups off Vancouver streets in just 3 hours. Increase in female binners associated with the project (from 5% to 40% currently). Many new partnerships with the government and NGOs.

[55] https://www.binnersproject.org/binners-meetings.html

4.4 SELECTED GRASSROOTS INNOVATIONS IN KISUMU, KENYA

4.4.1 ENSURE CLEAN, HEALTHY AND SUSTAINABLE ENVIRONMENT FOR MARKET TRADERS

Name of the initiative: Kibuye Waste Management CBO

Location: Kibuye Market, Kaloleni, Shauri Moyo Ward (Kisumu)

Name of researcher: Michael Oloko

Type of innovation: public service provision

4.4.1.1 DEVELOPMENT OF THE INNOVATION

It was started in February 2014 by Kibuye Market traders under the department of Environment at the City as a CBO at Kibuye Market. The County had no employees to clean the market leading to haphazard dumping of waste making the market uninhabitable. Hence the market traders decided to form a CBO for themselves geared to addressing the issue of waste menace. The CBO does market cleaning and sorts the waste to be recycled/recovered. The CBO started with 150 members and is currently composed of more than 100 members drawn from the market.

The innovation entails collection of organic waste from the market and then sorting. The sorted waste is pre-weighed and categorized for use e.g. composting, briquette making or animal feed production. For composting, waste is wrapped into polythene and left for two weeks for decomposing process to take place. In the third week, it is turned so as to ensure homogeneity in decomposition. During this stage of turning, chicken waste and saw dust is added to enhance decomposition process. The decomposing heap stays wrapped with polythene for one more week for final decomposition. Thereafter, the heap is unwrapped and contents spread for sun-drying, about two to three days (depending on weather condition). The dried compost is then ground to obtain fine powder. The ready compost/manure is finally packed, ready for sell.

Resources needed include, but not limited to equipment and tools such as wheel burrows, spades, rakes bots and gloves, nose masks which were bought by funds from members contributions and donations from KLIP, JOOUST, Maseno University, Mistra Urban Future (NGO), Cooperative Bank of Kenya, Kibuye branch.

Challenges

Challenges faced by the initiative include: Finances (inadequate finances to run operations like labour and buy of advanced equipment/tools); Packaging and standardization of end product; inadequate marketing and sales skills/techniques; composting site is small thus serves as a demo centre.

Opportunities

Diverse opportunities exist such as: the CBO enjoys monopoly in composting within the market and the city (courtesy of good political goodwill with local government); availability of abundance waste

to be recovered/recycled; ready market for recovered products such as manure, briquettes and animal feeds.

Achievements

Positive changes both within and outside the market can be seen and felt. This has led neighbouring market traders to form their own CBOs to realize a clean, healthy and sustainable working environment. This include: Kondele and Kibuye cluster B & C. The CBO is also contracted by County/City government to do cleaning in areas outside their purview.

4.4.1.2 STABILIZATION OF THE INNOVATION

Since the CBO started, it has grown with more market traders joining based on positive initiatives rolled in their midst. Production of products such as manure, briquettes and animal feeds has been consistent all along. Both local and International visitors come over for benchmarking. Local and international universities have been incorporated in identifying/researching on proven best practices for optimal production of products such as manure, briquettes and animal feeds. Critical issues such as climate change, waste management and urban security are being addressed.

4.4.1.3 INCLUSIVITY OF THE INNOVATION

The innovation is all inclusive right from operations up to management/executive level. All the traders within Kibuye market qualify to be members of the CBO and all the market sections are represented.

4.4.1.4 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

The work of CBO has won accolades from other market traders, the local County/City government and are now being supported in terms of provision of land (through temporary occupation license), for piloting; linkages with local and international universities and waste actors.

4.4.1.5 OTHER CHARACTERISTICS OF THE ORGANISATION INTERESTING FOR THE CASE AS A PROFILE

Other activities engaged by CBO include: table banking; training and capacity building to other upcoming CBOs.

4.4.2 RECYCLING OF PLASTIC BAGS AND INDUSTRIAL WASTE

Name of the initiative: Tema Tema Self Help Group

Location: Nyalenda (Kisumu)

Name of researcher: Michael Oloko

Type of innovation: Improve the economic status of members

4.4.2.1 DEVELOPMENT OF THE INNOVATION

Started as a merry go round in 2002 with 9 members to improve the economic status of the members by boosting their businesses through small loans. After participating in world environment day of 2005 they were introduced to clean-up activities where they saw the potential of using plastic waste as a business idea. In 2008, two of their members were trained in weaving by the Baptist church of Kisumu who were empowering community health workers with vocational skills. The members then trained others who then begun using plastic strands to weave bags and cushions and back rests using plastic and textile remains and sponge from tailors' waste.

Their Innovation entails making of items such as mats, bags, and purses from plastic strands and cushions and back rests from textile waste. The waste used is collected from occasional community clean ups and some purchased from waste entrepreneurs at the Kachok dumpsite (in case, collected waste is not substantial). Polythene papers are cut and strewn into strands and woven with needles into mats and bags, and purses Tape from old cassettes are also combined with the polythene strands when available for the weaving process. The Cushions and back rests are stuffed with sponge and textile remains found at tailoring shops. The finished products are sold mostly exhibitions and to tourists.

The self-help group was introduced to this innovation training and capacity building by faith based organisations like the Baptist church of Kisumu in the year 2008 which got them into weaving and production of artefacts. Similarly, organizations such as UN Habitat, The International Labour Organisation and Umande trust NGO trained the members on waste management.

Most of the raw materials/resources required are waste cassette, film tape and polythene strands (from polythene bags at the dumpsite/clean-ups/local industries/business centres). Zippers and ribbons are sometimes needed for value addition to purses, cushions and bags. They also get the sponge and textile waste from local tailors who offer their waste for free or at a minimal cost. Savings from member's contributions, table banking or social fund/sales are used to buy additional materials (in case of deficit).

Some of the challenges include: locals have negative attitudes toward waste products which affects local sales (group is carrying out sensitization talks and awareness on environment during clean up exercises); there is a huge fluctuation in prices of the polythene waste as they are bought from the dumpsite and from local industries which can be sometimes be exploitative; the plastic ban by the government in the country, the local industries are sceptical about selling their waste especially to groups and organisations that may not have the required operating licence issued by NEMA as they fear facing penalties; low capital base – They managed to get start-up capital from Kenya Organisation for Environmental Education (KOEE). They also engage in table banking where they use proceeds from their savings to feed the initiative. Members also contribute from their pockets when funds are low and there is a need to meet demand hence raw materials can be procured. Occasionally there are in

kind donations from other partners like International Humanist Alliance who donated ribbons and which are sued for value addition.

Opportunities include: creation of working partnership with the County/City Government and NEMA through which they have managed to attain a letter of recognition that allows them to transact waste entrepreneurship at a small scale without the need for a licence; exhibitions they have participated in have helped sell their products and market them; they have gained valuable knowledge from capacity building and trainings from the UN, ILO and local NGOs; Kisumu Local Urban Forum trained the group on table banking which has improved the finances of members and boosted the recycling initiative.

The initiative has positively contributed to both internal and external changes such as contributing to improve the environment through recycling waste. This also creates income streams for members though sell of items/products made.

4.4.2.2 STABILIZATION OF THE INNOVATION

Since the organisation started production of recycled products in 2005 they have been selling about 80 cushions and 200 other woven products, a year. The initiative has been consistent in its production and sales.

4.4.2.3 INCLUSIVITY OF THE INNOVATION

This group is fully inclusive as it hosts, widows and HIV positive members who are largely shunned by society. They also have 2 men out of 16 members being a women group which makes them gender inclusive as well.

4.4.2.4 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

In 2013/2014 members of the group trained women from Manyatta and Obunga informal settlements on weaving of baskets from polythene strands and making of ornaments from bits of paper, bone pieces and horns. The women were mobilised groups of survivors of gender based violence, divorces, school leavers and commercial sex workers. The groups have since disintegrated but some continue to pursue the trade as a supplementary source of livelyhood. Others picked it up: 5 women from Manyatta and 3 from Obunga who were formerly commercial sex workers have since taken up this innovation a source of livelihood over commercial sex work. Many persons especially women do the same as described in this case study (weaving and making products from waste materials) within Kisumu.

4.4.2.5 OTHER INTERESTING CHARACTERISTICS OF THE ORGANISATION

Main services - Making cushions, back rests, bags, purses, and mats from plastic strands and textile waste.

Gender composition - 14 women and 2 men.

Type of organisation – Self Help Group

Main Clients – Local exhibitions and orders from locals as well as tourists.

Main Opponents – Carpenters are giving stiff completion on the cushion and back rests but for the woven products a few other women groups engage in this occupation but at a smaller scale.

4.4.3 TECHNOLOGY INNOVATIONS

Name of the initiative: Ka Dorcas Okode – Kamongo Waste Paper

Location: Lutheran Church, Nyalenda (Kisumu)

Name of researcher: Michael Oloko

Type of innovation: sorting, processing, transportation

4.4.3.1 DEVELOPMENT OF THE INNOVATION

Dorcas Okode lived in Nairobi at Chandaria Waste paper recycling industries where her husband had a residence by virtue of being an employee. Upon his passing on in 1993 she had to vacate and relocate back to Kisumu to her place of birth to fend for her family having no occupation and income. From the experience understanding the paper recycling process as an observer she begun to collect waste paper in Kisumu in agreement with Chandaria Industries to supply them. Chandaria Industries would send their truck every two weeks to transport her collections. She employed a few people and hired hand carts to collect paper waste around town and in the neighbourhoods.

In 2014, she came across an Asian man who was the proprietor of Kamongo Waste Investments who was impressed by her work and requested her to supply him with waste. He later lent her a truck and rented her a space at the Lutheran church to put up a store since the volume of her collections was high and could be potentially higher but she was limited by resources. Her output has since increased exponentially and she has managed to start paying her own rent as well as collect waste not only in Kisumu as well as all over the Nyanza region.

This innovation entails: Dorcas collects all waste papers from local industries, offices, dumpsite and from clients who ask her to collect on call. Once collected to waste is brought to her yard at the Lutheran church where they are sorted and compressed on a bailing machine for easer transportation to Nairobi. In Nairobi the paper in mixed in a tank into pulp, dried and reprocessed to make books, cartons, boxes, tissues and other paper products.

Actors

Chandaria Industries was the main actor as they made her their agent to collect waste paper for them from the Kisumu Region. Kamongo waste later in 2014 became another major actor who empowered her to improve her services and increase her output.

Resources

From her meagre savings, she hired hand carts and drivers to collect and transport waste all over the city on a daily basis. She used her small profits to continue expanding until the point when Kamomgo Waste entrepreneur, her well-wisher stepped in to assist her with more resources such as a truck and a yard to store her produce. At the yard she managed to purchase a bailing machine to be able to press her collection and transport more bulk to Nairobi. The truck helps her collect further within western Kenya and sometimes even up to Tanzania.

Challenges

Harassment from (*crooked and corrupt law enforcement)* municipality officials who took advantage of her vulnerabilities to get her arrested and arraigned in court regularly for example if her carts were accidentally littering as they were being pushed around town doing collections.

Opportunities

Her network with Chandaria Industries enabled her to be able to kick start her career in waste entrepreneurship which enabled her to grow enough o now collaborate with Kamongo waste.

Through her network from extensive years of experience in waste in Kisumu he also has since secured major contracts to collect waste from major industries like Brookside dairies where she collects all the nylon polythene that are used to transport all the milk to Kisumu which a recycled to make fence poles.

Collection of waste paper positively changes the environment in terms of cleanliness and conservation. Similarly, the initiative improves local/national economy by offering employment and source of livelihood to many.

4.4.3.2 STABILIZATION OF THE INNOVATION

The organisation is consistent in its activities. Dorcas collects waste from large area of Western Kenya up to Kisumu town. She transports about 4 tonnes of paper waste to Nairobi every week at the moment.

4.4.3.3 INCLUSIVITY OF THE INNOVATION

The organisation is all inclusive to all members as long as they are willing to learn and work. Nobody else is doing this innovation at this scale in Kisumu although she has trained many workers over the years at her enterprise.

4.4.4 SCRAP METAL RECYCLING

Name of the initiative: Manyonge Investment

Location: Kibuye Market, Kaloleni Sub Location, Shauri Moyo Ward (Kisumu)

Name of researcher: Michael Oloko

Type of innovation: Recycling

4.4.4.1 DEVELOPMENT OF THE INNOVATION

Started as a Sole Proprietorship after working for a year as an artisan himself bending metal scrap into pales. The Innovation entails using Scrap Metals from used industrial metal drums to forge metal suitcases, metals, pales, traditional stoves ('jikos'). Metal containers are purchased from dealers after they have been discarded by industries/road construction companies. The drums are opened up, flattened, washed then dried. Afterward they go through different processes of straightening then cut to shape or sized for production of items/products.

Actors

Financially he started on his own through savings but received guidance and advice on the best products to make from a long-time friend who has been in metal product sales in Kibuye for many years. As an entrepreneur, he gathers the resources and contracts artisans to forge for him various products.

Resources

Resources used are mainly drawn from individual personal savings from his former employment as an artisan aided him to decide to go independent. He rented a small space in Kibuye and started to purchase raw materials (mostly metal drums that are used by road constructors to carry tar). The used-up containers are then sold by agents to scrap metal dealers in Kibuye of which he decided to be a part of. For labour, artisans do not work on permanent or contract basis but are paid a commission upon agreement of the amount of work necessary to be done or items to be made. Initially he had to share a storage space with other entrepreneurs but now he managed to build a store.

Challenges

Trust - Many artisans he contacts can be mischievous by either misusing resources allocated to them for work or downright stealing from him. He has had to get a group of artisans who he supervised over time and had to work from his store to develop trust and workmanship; Storage – Initially he had no storage space for his raw materials and finish products hence he had to share with other artisans which was bringing conflicts over occupation and missing items; Clients – When he started he had few clients since competition is stiff being in a scrap metal works zone (lowered prices and ensured quality finish of products to start drawing more clients).

Opportunities

Market – There is sufficient market for produce since Kibuye Market; Metals section of the market serves most of Western Kenya and its environs; Cheap Labour – The market is awash with plenty of hands for manual labour.

4.4.4.2 STABILIZATION OF THE INNOVATION

In 2014 when he was starting his enterprise was producing about 100 metal pales a month and retailing 80 metal suitcases a quarterly. In 2015, he started producing his own metal suitcases along with the pales and not just retailing. As recent as 2017, he was now supplying raw materials of scrap metals to the market to artisans and other entrepreneurs. In addition, he also collects the leftover tar from the metal drums that come from construction works and resales them for use to fortify the base of metal drums and boats for fishing. He plans to increase the market for his products to further outside the county and have a showroom to showcase his products

4.4.4.3 INCLUSIVITY OF THE INNOVATION

The enterprise is all inclusive and is willing to allow anybody who is willing to work. He contracts labour needed thus no training (s) (ready skilled or trained labourers).

4.4.4.4 OTHER CHARACTERISTICS OF THE GROUP

He resells tar which he collects from the remains left over in the metals drums that come from road construction works which comes as additional product.

4.4.5 CRUSHING BONES

Name of the initiative: Josephat Scrap

Location: Jua Kali, Kisumu

Name of researcher: Michael Oloko

Type of innovation: Processing of bones

4.4.5.1 DEVELOPMENT OF THE INNOVATION

Started in 2009, in Kisumu, by collecting bones from hotels and restaurants with his bicycle/ hand cart then sent to Nairobi (monthly) for crushing at Kariobangi Light industries. In 2013/2014, he managed to purchase his own bone crushing machine that was forged at Jua Kali for a cheaper price and begun

grinding his own collections. He has now secured a lot of supplies as hotels and restaurants store bones for him and some deliver through agents and dump pickers.

Innovation entails collection of bones from hotels and restaurants and steamed and dried and sorted. Very large pieces are broken into smaller pieces sizeable enough for the machine. 1st batch from the machine is sieved so that large particles are returned for a second crushing process in order to achieve finer end product before packaging and sale.

Actors

Started this initiative on his own after visiting an acquaintance in Nairobi who worked at Karobangi Light industries in Nairobi where bone crushing was taking place. He borrowed the idea for subsequent replication in Kisumu (there was no such initiative of bone collection then crushing).

Resources

Individual bicycle and locally made hand cart for the collection and transportation. He purchased a boiler from savings for steaming the raw bones from butcheries. He got a bank loan to purchase the crusher for the bones and added savings from previous sales.

Challenges

Storage – He initially did not have storage so he would store his bones in sacks beside the road where dogs would scavenge the sacks and rip open some to access the bones. The decaying bones also attracted a foul smell especially when rained on. Which made neighbouring businesses to raise complaints.

Financial – Upon delivery of the bones to Nairobi, payment wasn't immediate as he had to wait three days for the bones to be sorted and the food remains on them cleaned out and weighed and he didn't have the means to accommodate himself in Nairobi that long. Sometimes payments took longer and some buyers never ever paid for supplies. This led him to acquire his own crusher and start crushing his bones independently and selling a finished product.

Sales – Selling his locally produced bone meal was a challenge since there was no sensitization on available local bone meal and the locals preferred or trusted that which they bought at the supermarkets. So sometimes he was forced to sell to other areas such as Nyahururu and Naivasha where there was a higher demand for his product. He also diversified into crushing plastics as well to supplement his income. Sales for bone meal is also seasonal as it is purchased mostly by chicken farmers who breed more during festive seasons.

Equipment - His machine can break down like it has currently and costs a lot to fix which has stalled production.

Recycling of bones provides a nutritional meal to farm animals. This reduces the waste thrown out thus ensuring a clean and healthy environment. The initiative creates employment since he pays suppliers of bones like the waste pickers and other agents.

4.4.5.2 STABILIZATION OF THE INNOVATION

In 2012, when he stared he was collecting and transporting about 5 tonnes of bones every month to Nairobi. By 2013 that number shot to 10 tonnes a month. In 2014, he now purchased his own bone crusher and crushes the same ten tonnes for sale. In October 2017 to date, his machine broke down and hence the bone crushing has halted until he fixes it but finances are a bit of a crunch. He is relying on bone crushing to sustain him until he gets stable.

4.4.5.3 INCLUSIVITY OF THE INNOVATION

The innovation is all inclusive and works best with women who he says do sorting work the best and are also reliable bone suppliers.

4.4.5.4 OTHER INTERESTING CHARACTERISTICS OF THE ORGANISATION

He also shreds plastic waste which he sells to Pride Limited and Premier in Nairobi where they make plastic pales, drums and containers.

4.4.6 COLLECTION OF DOMESTIC WASTE FROM RESIDENCES

Name of the initiative: Gasia Poa

Location: Manyatta A, Kondele Ward (Kisumu)

Name of researcher: Michael Oloko

Type of innovation: Collection, Sorting, processing, transport and sanitation services.

4.4.6.1 DEVELOPMENT OF THE INNOVATION

Started in 2005 as Manyatta Solid Waste Management registered by SANA International with 15 people. In 2007 Kisumu Integrated Solid Waste Management Programme (KISWAMP) under the municipality wanted groups that could operate as solid waste entrepreneurs. And that led to the beginning of Ghasia Poa which was unregistered at the time but got the support and training of capacity building on waste management. In 2010 Ghasia Poa was registered. The innovation entails collection of domestic waste from residences in neighbourhoods, sorting out plastics, metals and transport of the remainder to the dumpsite.

Actors

SANA International which brought to life the waste entrepreneurs by offering a platform through training on waste management. KISWAMP which enabled the formation of different groups that led to Ghasia Poa being a waste entrepreneurship outfit.

Resources

In the beginning, one hand cart purchased with savings. Rented one to transport waste collected from households in Manyatta to the dumpsite. Later on, three more were bought from the business proceeds. Additionally, bought a wheelbarrow to pick waste from households in impassable terrains by the hand carts.

Rationale

KISWAMP under the then municipality, wanted groups that could operate as solid waste entrepreneurs then drove Ghasia Poa to be formed and started work before being formally registered in 2010.

Challenges

Stigma from family and friends who would not support a cause that dealt with waste since they considered it dirty and hence shameful. A lot of sensitization had to be done to show the benefits of waste management to the community through evidence from other waste entrepreneurs in other places. A trip to Thailand in 2011 by the director and in 2012 to South Africa to represent Kenya as a waste picker and through the support of WEIGO (Women Informal Economic Global Organisation) also helped win their support.

Lack of sufficient transport as only two hand carts were owned in the beginning and the area to be covered vast.

Bad infrastructure in informal settlements as roads are bad are unavailable hence access difficult in terms of moving waste from the residences to the transfer points.

Positive changes initiated by Gasia Poa include: a clean, healthy and sustainable environment; creation of employment thus improving livelihoods and generally improves hygiene of community as pit latrines and septic tanks are occasionally emptied.

4.4.6.2 STABILIZATION OF THE INNOVATION

In 2007, the initiative started within Manyatta only and between 2017-2018, 1,017 households subscribed stretching across Mamboleo, Manyatta, Polyview, Millimani, Ogango and Riat areas within Kisumu. The initiative has ventured in pit-latrine emptying providing sanitation services.

4.4.6.3 INCLUSIVITY OF THE INNOVATION

Engages waste actors at different levels for varied durations (casuals and permanent); collectors and hand cart operators, supervisors, casuals on daily basis. This initiative has already mentored 3 individuals who have started to operate. Kibuye waste management (CBO) was mentored on composting of organic waste. Two individuals started Lord of Mercy Waste Management and 'Ever green Waste Management' after observing the success of Gasia Poa but later sold their enterprises along with clients to Gasia Poa due to failure to operate on profit.

4.4.7 KISUMU WASTE ACTORS NETWORK (KIWAN) *SAVINGS AND CREDIT CO-OPERATIVE LIMITED*

Name of the initiative: KIWAN

Location: Kisumu

Name of researcher: Michael Oloko

Type of innovation: Brings together various waste actors (collectors, pickers, recyclers) under one umbrella to:

- Play a transformative role from a "waste picker" to a sanitary cleaner.
- Champion the maintenance of clean, healthy and sustainable environment.
- Advocate promotion of 3Rs for policy formulation.
- Create employment for the youthful populace.

Photo 1: City manager of Kisumu formally recognizing the newly created Kisumu Waste Actors Network (KIWAN), 23.04.2018

4.5 SELECTED GRASSROOTS INNOVATIONS IN MANAGUA, NICARAGUA

4.5.1 NETWORKING AND GOVERNANCE

Name of the initiative: Nueva Vida Limpia

Location: Ciudad Sandino, Managua, Nicaragua

Name of researcher: Jessica Pérez

Type of innovation: Networking and governance (communities, companies, local governments, NGOs)

4.5.1.1 DEVELOPMENT OF THE INNOVATION:

In recent years, international aid agencies and non-governmental organizations, in alliance with local governments in Nicaragua, have funded and promoted the creation of waste collection cooperatives as part of modernization projects of municipal solid waste management systems. A particular case of alliance between the local government and the international cooperation with waste pickers is the creation of the Cooperative 'Nueva Vida Limpia' (New Clean Life), which is located in the municipality of Ciudad Sandino, department of Managua.

In Ciudad Sandino, hundreds of waste pickers had worked individually competing with each other on the dumpsite since the establishment of the dump almost a decade ago, to maintain their livelihoods by reclaiming recyclable materials to sell to middlemen. The alliance between the city and the international cooperation created a cooperative for these waste pickers, once the dump was converted into a municipal sanitary landfill. Waste pickers were motivated to become part of this cooperative mainly because of their situation of unemployment and being able to finding in recycling a source of income and a way to improve their social and economic conditions.

The cooperative obtained a municipal concession to collect in some neighborhoods and new residential areas located in the commercial sector of Ciudad Sandino. They also had access to the recycling plant to pre-select, wash, clean and stockpile the recycled materials for sale. The opportunity to work together with the support of the local government posed a challenge for them in terms of organization, management and political training to advocate for inclusive waste governance, particularly to ensure the compliance with the agreements made between the city and the waste pickers.

This model of alliance is considered an innovation because it demands an effort to align different interests to achieve social, economic and environmental change in the local waste management. Hence, it is important to note that the successful and sustainability of this type of innovation requires a long-term commitment of the local government and continuous monitoring to ensure its development.

Actors

The innovative project and the strengthening of the solid waste management system in Ciudad Sandino was promoted by the City Hall of Ciudad Sandino, funded by the European Union (Cooperation for the Development of Emerging Countries, COSPE) in collaboration with the national network of waste pickers REDNICA (Red de Emprendedores Nicaragüenses del Reciclaje).

Photo 1: Members of *Nueva Vida Limpia*

Resources

The project involved the construction of a new recycling plant to improve the working conditions of the waste picker families that previously worked on the open-air dump in that municipality. The total investment cost in the construction of the plant, purchase of equipment and machinery amounted to 330,000.- Euros (381,000 US$). For their legal constitution, the cooperative received legal advice from REDNICA. A fund was created by the Ministry of Family Economy (MEFCCA) to support the activity. Finally, the cooperative was registered in the National Assembly.

Challenges

Since 2014 the cooperative has been operating, they have received the support of REDNICA and the municipality. They have tricycles for the transport of the waste and they have a collection center that facilitates the classification work. They also have designed three collection routes for source separated materials: community route, business route and school route. Nevertheless, there is a challenge to conciliate the formal and informal waste collection system. The local government has vested interests since its workers also collect recyclables. The cooperative uses resistance and negotiation strategies to solve conflicts of interests with the municipality. Their strategies are dialogue, meetings, assemblies and protests if the dialogue does not work.

The efficient management and administration of the cooperative's resources continues to be a challenge. In order to have a better performance, they continue strengthening transparency in their

functions as well as accountability. In these years, they have managed to obtain greater income from the sale of cardboard and aluminum. In the future, they expect to acquire other means of transport such as vehicles and vans. In addition, they expect to continue with their training and expand the facilities.

The gender issue also is a challenge and there is not yet a strategy to address it. The cooperative board of director is led by women, but decision making is influenced by the interests of their male partners, subtracting authority and creating discomfort among the members due to lack of independence and not responding to the needs of the cooperative.

Timeline

In 2014, the cooperative was legally constituted.

4.5.1.2 STABILIZATION OF THE INNOVATION

The cooperative is active after four years. Although there have been changes in the board of directors and some members do not continue, most of them have kept working together facing challenges. In order to consolidate the innovation and grow, they need more knowledge and strengthen their alliances. To date, they have received training on recycling, cooperativism, finances, crafts and how to make organic fertilizer. They are also in the process of establishing formal partnerships with some companies in the area to collect.

4.5.1.3 INCLUSIVITY OF THE INNOVATION

This initiative seeks the establishment of more dignified working conditions for a sector of the population traditionally marginalized by finding a means of living in solid waste. Waste pickers in Nicaragua are people who live in extreme poverty, with low levels of schooling, a reason that prevents them from accessing other sources of employment.

The alliance between local government and waste pickers allows them to recognize and formalize their work by redefining ideas of cleanliness, and questioning taboos that waste is dirty, impure, and without value. The separation at the source is a way to show the added value, mainly promoting a non-existent recycling culture in homes. It also generates spaces for dialog and meeting points between companies and waste pickers to redefine what corporate social responsibility means and to identify new products that can be recycled.

There is a mentality change, mainly in the companies, with respect to the work of waste pickers. They are allowed to enter their facilities without any social stigma. Companies previously donated the materials to certain non-governmental organizations (ONGs) as part of their social responsibility program without considering whether these actions had any impact. Now, they are in the process of building relationships with waste pickers and are looking for ways to collaborate with them.

4.5.1.4 OTHER CHARACTERISTICS OF THE GROUP

The cooperative is currently made up of 18 members, 39% are women. Women lead the initiatives and the gender composition of the cooperative's board of director is made up of 50% women. The average age is divided into two groups: from 16 to 25 years (50%) and from 49 to 60 years (50%).

The main services provided by the initiative are the collection, cleaning, transport and classification of recyclable materials such as plastic, glass, metals and paper. Their main clients are businesses, the community and schools.

4.5.2 GENDER INCLUSIVENESS

Name of the initiative: AMAO (Asociación de Mujeres Recicladoras)

Location: Ometepe Island, Rivas

Name of researcher: Jessica Pérez

Type of innovation: Gender inclusiveness, Networking and governance (communities, companies, local governments, NGOs),

4.5.2.1 DEVELOPMENT OF THE INNOVATION

Asociación de Mujeres Recicladoras (AMAO) (Association of female waste pickers) is a cooperative located in Ometepe Island. Ometepe is a natural island, in the middle of the Cocibolca Lake, formed by two towering volcanoes and visited annually by thousands of tourists that consume thousands of bottles of water and soft drinks. Its population amounts to 42,000 people, with a territorial extension of 276 km². The most important cities that concentrate the majority of the population are Moyogalpa (12,000 ppl.) and Altagracia (23,000 ppl.), which are also the two main ports of access to the island.

In Ometepe, the tourism industry is one of the main economic activities on the island, so waste management becomes a priority to attract domestic and foreign tourists. In the same way, for the people from the island it also becomes a health priority considering the territorial extension and the amount of plastic that enters to the island, at least 10 million tons, as well as all the waste that is generated a day. According to the latest available data, approximately 15 kilos of solid waste per day is generated.

Despite the importance of waste management, local government lack the resources and capacity to collect all the waste on the island, so garbage becomes a problem. For this reason, in 2010 an initiative to organize groups of women with a dual purpose begins to take shape: to provide work for women in extreme poverty and support the cleaning of the island. The project also aimed to empower women, they received workshops on gender issues, management, and the environment.

The cooperative AMAO was created in 2010, integrated of unemployed women from Moyogalpa who began to recollect almost 1,800 kilos of plastic, glass and scrap metal per month, in order to develop women's economy and to promote a municipality initiative called "the cleanest island". Therefore, this innovation considers two important aspects: a model of alliance with the local government and the gender inclusiveness.

Actors

The city government of Moyogalpa promoted the organization of this group of women. The cooperative was also organized with the support of RENISA (Recycling and International Business, S. A), a company that promotes integral ecological services and is one of the main exporters of recyclable material in Nicaragua, who provided solid waste management training. The funds for the remunerated payment of women's work were financed by the European Union.

Resources

The city government of Moyogalpa provided facilities to collect, classify and sort the waste. The municipality also obtained funds to pay the women almost two dollars a day, and provided them with free transportation to take their sorted materials to recycling plants outside the island. Food and services companies provided equipment and assistance. Compañía Cervecera de Nicaragua (CCN), a Nicaraguan brewery, financed the purchase of plastic compactors for $14,000 for the two municipalities in Ometepe. However, they were never put to use because of the fuel cost and difficulties in operating the compactor by waste pickers. Tourism businesses also donated their recyclable material to women instead of selling it.

Challenges encountered and strategies to address them

The innovation developed as a particular project instead of a comprehensive policy represents a challenge, mainly for the members of the initiative who lack experience in the management of a cooperative. Once the cooperative was created, the local government did not follow up on the initiative development. This led disorganization and some members of the cooperative dropped out.

To date, the innovation has not been successfully anchored in the local government as it has not received the necessary continuity. The political will to develop strategies to deal with the problem is crucial, so changes in government represent a barrier and make groups dependent on the political support of certain parties that respond to their own political interests.

Timeline

2010: Organization of the cooperative with support from the city government of Moyogalpa and RENISA.

2011: Reorganization of the cooperative due to lack of follow-up and advice from the city goverment. RENISA returned and accompanied the project for the formation of two groups of waste pickers, one in Altagracia and the other in Moyogalpa.

2012: The organization problems continue, REDNICA supports to "renew" the cooperative with new members, remaining only 3 women from the previous group.

2013-2018: Several reorganization processes occurred in that period due to lack of group cohesiveness and organization. In 2010 was created with 25 people, 22 women and 3 men. Currently (2017) there are 8 people, all members of the same family.

4.5.2.2 STABILIZATION OF THE INNOVATION

Currently, the cooperative no longer has an alliance with the municipality. The initiative still receives support from food and services companies on Ometepe island, mainly from CCN. They provide equipment and subsidize the transportation of plastic from the island to recycling plants. These actions are part of their corporate social responsibility programs.

The initiative in these years has undergone several reorganizations, giving rise to the creation of a new group called CARMEO (Cooperativa de autogestión de reciclaje de mujeres emprendedoras de Ometepe) (Self relient recycling cooperative of women entrepreneurs in Ometepe). Despite their differences, both cooperatives work together to meet quotas of recycled materials, given the high transportation cost involved in sending recycling companies in Managua.

The cooperative has participated in various workshops and training on cooperativism, solid waste, gender issues and crafts (bottles and piñatas).

4.5.2.3 INCLUSIVITY OF THE INNOVATION

The initiative includes women living in extreme poverty, being relegated to housework and doing casual work. The inclusion of women breaks down the stereotype of the role women have traditionally played in rural communities.

The innovation has allowed the redefinition and revalorization of the role of women, different from traditional roles, which not only implies housekeeping but also to generate income, gaining spaces to integrate women in the economic activities. The women included in the project have gained confidence and inspired young women, becoming agents of change in their communities.

4.5.2.4 OTHER CHARACTERISTICS OF THE ORGANISATION INTERESTING FOR THE CASE AS A PROFILE

Nowadays, the initiative has 8 members where 50% are women. However, women lead the cooperative and the gender composition of the cooperative board of director is made up of 60% women. The members are family, where 62.5% are young people in an age range of 16 to 25 years.

The main services provided by the initiative are the collection, transport and classification of recyclable materials such as plastic and glass. They collect recyclable household waste (dry), industrial waste (hotels, restaurants) and institutional waste (hospitals, schools). Their main clients are tourism businesses.

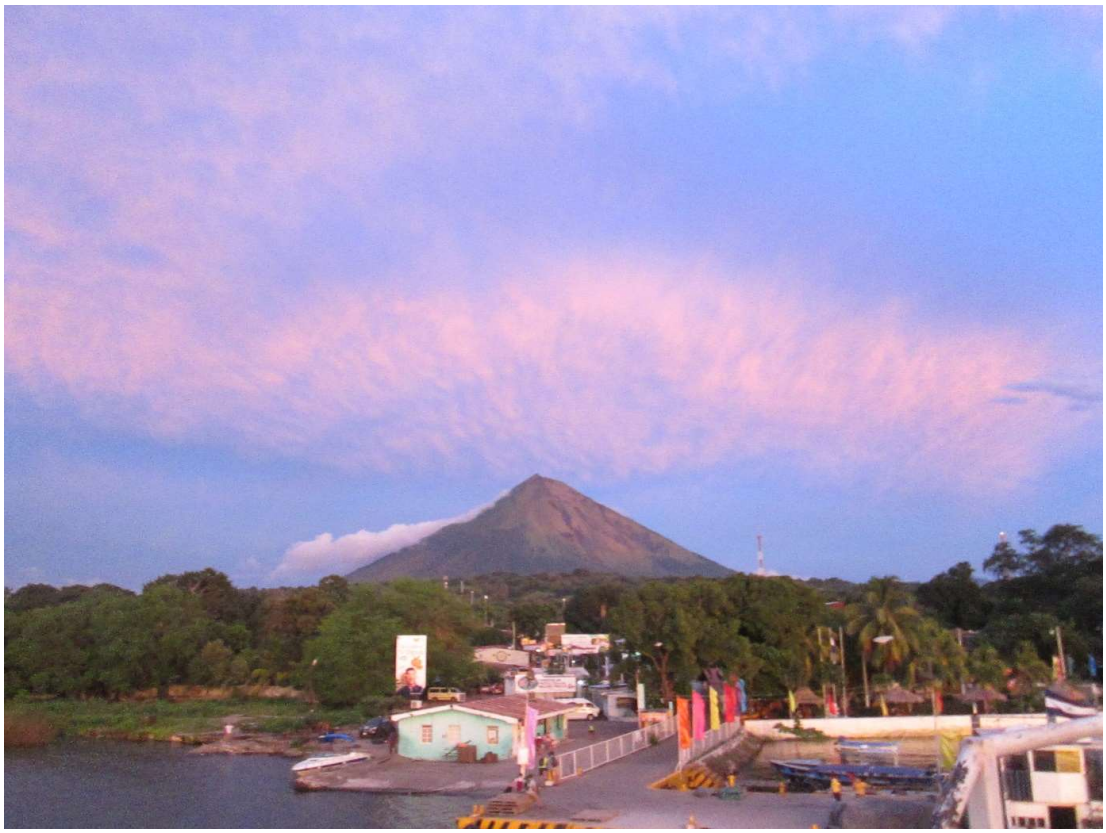

Photo 2: View of Ometepe, a natural island, in the middle of the Cocibolca Lake

4.6 SELECTED GRASSROOTS INNOVATIONS IN DAR ES SALAAM, TANZANIA

4.6.1 COLLABORATIVE GOVERNANCE AND FINANCIAL CONTROL

Name of the initiative: Umoja wa Wazee wa Bunju B[56] (UWAWABU)

Location: Dar es Salaam

Name of researcher: Goodluck Charles

Type of innovation: Enforcement of transparency and financial control of the community-based waste picker group jointly by the local government, households, bank and group itself through the use of electronic fiscal devices (EFDs) and participatory decision making.

4.6.1.1 DEVELOPMENT OF THE INNOVATION

UWAWAMBU is a group of 37 elders registered under the Societies Act (2002) to run various community based activities at Bunju B, Dar es Salaam. The group was registered in 2015 after meeting the registration requirements including renting their own office. The main activity of UWAWAMBU is waste collection and provision of social support amongst members. The leadership of UWAWAMBU is structured with a chairperson, vice chairperson, the secretary and vice secretary, the treasurer and the steering committee. The leaders are elected every two years. The group started as a tree planting initiative and collection of waste at the ward for the purpose of attracting partners to support their initiative. In April 2016, the government announced a tender for waste collection in their ward, and they applied for it and got the tender. Contrary to a common practice in most wards where waste collection tenders are awarded for one year, the group got a three-year tender due to their track records.

As many other informal organizations in Tanzania, the main challenge faced by the group was how to ensure transparency and control of funds collected by the group leaders. In order to win the confidence of the community, the group through their steering committee decided to comply with financial procedures stipulated by the local government by collaborating effectively with the local government at the sub-ward, ward and municipal council. Besides financial reporting to general meetings and the steering committee overseeing the leaders of the groups, they decided to collaborate with the local government, households and banks to control their finances. They also acquired the electronic fiscal device (EFD) machines to issue receipts, and integrated their internal governance system with the local government for strict control of their finances.

The main control mechanism is that all payments made by the households to UWAWAMBU must be supported by the EFD receipts printed by the treasurer after receiving the payment (Figure 1). Once the receipt is issued the records are automatically transferred to municipal council records. The

[56] Association of Elders, Bunju B

payment for service providers and staff is requested by the Group Treasurer, approved by the Treasury Committee and forwarded to the ward and municipal council together with the bank statement for final approval. Before the Treasury Committee approves the payment, they have to see the bank statement and receive the Treasurer's report on the financial performance of the group. The municipal council approves the payment after reconciling their EFD records with the bank records (Figure 5). If there is mismatch of the transactions, the local government will inform the group leaders and the payment will not be approved until the difference is sorted out. The municipal council speeds up the process, because they earn 10% of the collection made from waste collection. The households become part of this innovation because they demand EFD receipts when they make payments, and they are all aware of the procedure. This process has enabled the initiative to ensure financial controls increasing the confidence of the households in their initiatives.

Figure 5: Fee collection and payment procedure by the community based groups

The necessary resources for this innovation were: the technology, sufficient fee collection teams and time needed to comply with the process. In order to have these resources, the group capitalized on the complementary benefits of each actor. The local government supplied the EFD machine and linked the machines with its internal system for the purpose of generating 10% of the revenue which was basically used for ward and sub-ward development. In this case, the local government was very effective in facilitating payment. The bank came in as a way of mobilizing deposits from the waste collection groups and it was ready to comply with the requirements of the innovation for a business purpose. The group elected six members to support the Treasurer in revenue collection on agreed commission of 10% paid to the members. In this way, the innovation is working quite effectively, and the group reported that there had not been any misuse of funds while the community had developed very high confidence in the group.

4.6.1.2 STABILIZATION OF THE INNOVATION

The innovation has existed and worked effectively for a period of two years, and stands a great chance of sustainability given the support and interest of the key actors involved. The model is now being adopted by other wards and sub-wards to resolve a critical challenge of dishonesty of group employees. Perhaps this kind of governance can help to generate further ideas on how to resolve the challenge of control and increase payment of fees in most initiatives.

4.6.1.3 INCLUSIVITY OF THE INNOVATION

The innovation is owned by the group (comprising elders and retirees), community and the local government. The majority of the workers involved in this group are unemployed youth (both males and females). While the innovation is inclusive, it gives the group a greater control of their resources ensuring that the group members participate in it. The bank accounts, receipts and all transactions are made under the name of the group after approval by the steering committee and this ensures control by the group.

4.6.1.4 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

Although some waste collection groups have started to use EFD machines to collect fees from the households, participatory payment approval which brings the groups at the forefront with the support by the local government, banks and community has been the main lessons picked-up by the nearby waste collectors. At least two groups have adopted a similar model and there has been a peer to peer learning among the leaders of the groups. The group secretary belongs to another group (Kihonzile Community Group) and she has shared the innovation with the group. However, Kihonzile group uses a contractor to manage the entire waste collection activity and, therefore, the main practice is that the households are issued with the EFD receipt but the money goes to the contractor's account. In this case, collaborative governance is partially practiced.

4.6.1.5 OTHER CHARACTERISTICS OF THE ORGANISATION INTERESTING FOR THE CASE AS A PROFILE

This is an elders and retirees group with the people ranging from 50 years and above. It is a unique group in the sense that most members are relatively weak, and, because of that they work with young people. The gender composition is women (35%) and men (65%). Besides the waste collection, members participate in each other's family events including ceremonies, burial services and other family matters. Consequently, the group cohesiveness is very strong. Given the age of the group members, many face health challenges including death of some of their members (one so far). In order to mitigate this challenge, they decided to lower the age of the eligible members from 60 year (retirees) to 50 years. Overall, the community, local government and households support the initiative and they are happy about the group innovation.

4.6.2 ACCESS TO WORK SPACE AND BETTER PRICES THROUGH GROUP NEGOTIATION AND LOBBYING.

Name of the initiative: Mazingira Cooperative Society

Location: Muhimbili, Dar es Salaam

Name of researcher: Goodluck Charles

Type of innovation: The Society negotiated and lobbied for the work space and better prices for the purpose of protecting their members from exploitation of the large companies and attracting more member to the initiative.

4.6.2.1 DEVELOPMENT OF THE INNOVATION

Mazingira cooperative society was registered in 2012 under the Cooperative Act (2003) for the purpose of providing environmental conservation services in Tanzania. The society was initially established by 60 members (currently it has 100 members, with 60% of them being women) with a dream of providing their services across the country. However, the society operates in Dar es Salaam aiming to bring together individuals and companies involved in buying waste materials from waste collectors (whereas most of them are youth) and selling them to recyclers and factories. To become a member, he/she must pay an entry fee of 10 US$, make a contribution of 2.5 US$per month for the rent and have to be in the same business. Members buy shares worth 5 dollars minimum with a maximum of 20 US$. The management, governance and operations of Mazingira Cooperative Society are guided by the Cooperative Act whereby the society is governed by the chairperson and the board of ten elected by the members for a period of five years. The initiative is overseen by the Regional Cooperative Officer who ensures that they comply with the governance and financial guidelines of running cooperatives.

When the initiative started, members used to sell the waste bought from primary waste collectors to Chinese and Indian processing plants and factories at a price agreed to with the buyers and/or based on the market price of the recyclable material. Yet, three challenges emerged which triggered the innovation: First, the companies which were buying from their members began to buy waste directly from primary waste collectors. Second, because of the pressure of buying waste directly from the primary waste collectors, the companies negotiated for very low prices, yet most members did not have the work space for sorting the waste they bought from the primary collectors. The society initiated three strategies to address the challenge. First, they embarked on collective bargaining by restricting their sales to the buyers who were ready to pay the market price for the waste collected. In relation to this, they negotiated with the companies and made an agreement with some of them to buy waste from their members at an agreed price rather than buying directly from the primary waste collectors. Second, they dialogued with the municipal council to ban individual companies from buying waste collected directly from the households or from the primary waste collectors. Their main negotiating point was that they had been able to formalize their members through the society and they were promoting employment to youth in the city. This negotiation was successful and companies were required to purchase waste materials from transfer points through the society. Third, the society negotiated with the municipal council for their members to get permission to access transfer points and open spaces for separation and sorting of waste. The municipal council granted the permission to the members of the society to access some areas temporarily at their own cost. Although they are not

disturbed by the council, they have to incur some costs and the places are not assured for them. Thus, the society is now negotiating for a bigger and permanent area.

The society succeeded to bring about market stability where the supply chain became more organized and stable as buyers operate from their premises as opposed to when they had to move around. They have had the ability to improve their bargaining power which reduces exploitation from buyers because they could always threaten to change buyers in order to fetch better prices. In some cases, the buyers lend money to members of the Society and deduct their money from their payments for the waste materials supplied.

The resources needed for the lobbying and negotiation was basically, a little bit of money which was contributed by members and the negotiators who were basically the Chairperson and board members.

Photo 1: A member of Mazingira Cooperative Society at a temporary transfer point, granted by Ilala Municipal Council.

Generally, she was happy to be a member of the society. When the prices of materials go down, the Society usually lobbies as a group to make sure the prices increase, and sometimes they seek audience with the government officials to ensure the sustainability of the market for their materials. When the recycling industries decided to come to the street and buy the materials from primary collectors, it seemed it was the end of their business because the waste collectors started taking their materials to the large industries as their price was a bit bigger than what the intermediaries offered. Mazingira Cooperative Society lobbied for the government to stop industries from buying waste from primary collectors, and this move was successful. That is why most members are happy to belong to Mazingira Society.

4.6.2.2 STABILIZATION OF THE INNOVATION

The innovation happened in 2013. However, negotiations, lobbying and advocating for members has been a consistent activity of the society due to emerging challenges over time. More members have joined the initiative and they are willing to pay their annual subscriptions given the value they gain through the initiative.

4.6.2.3 INCLUSIVITY OF THE INNOVATION

The innovation protects the marginalized group in the sense that the members of the society are able to engage the government and large companies to protect their members. Yet, due to the possibility of exploitation of the primary waste collectors, the society is cooperating with the UG-Mazingira which is the national association of the primary waste collectors. The society supports both their members and those of UG-Mazingira to have a fair business deal in order to avoid the risk of the primary waste collectors to be exploited by the members of the Cooperative Society. This is done through joint meetings and linkages between the members of the two cooperatives.

4.6.2.4 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

The society has exchanged the innovation with UG-Mazingira, and the members of this group acknowledged they could negotiate the prices better and access the transfer points. They are recognized by the government and they are now getting support from the community. This is contrary to the past practice when they used to be chased away by the local government.

4.6.2.5 OTHER INTERESTING CHARACTERISTICS OF THE ORGANISATION

The gender composition is 60:40 for women and men respectively. The main reason for dominance of women is the nature of operations whereby most men dominate the waste collection activities and women prefer buying and selling. The main supporters of the innovation are the members of the society while the main opponents are the recyclers and the companies buying from the members of the society. Finally, the members have the arrangement to support each other on social aspects. If someone is sick, for instance, they contribute to assist in the process of linking the member to the national health insurance fund as they usually don't have a social security scheme.

4.6.3 SOCIAL FUND FOR GROUP MEMBERS

Name of the initiative: Umoja wa Wazee wa Bunju B (UWAWABU)

Location: Bunju Dar es Salaam

Name of researcher: Goodluck Charles

Type of innovation: The group mobilize the members to make joint savings in their social fund through monthly contributions which are deposited in a separate group account for the

purpose of distributing the funds to group members at the end of the year, also, supporting members in incidents like illness, ceremonies and death.

4.6.3.1 DEVELOPMENT OF THE INNOVATION

The group linked to this innovation UWAWAMBU has already been introduced earlier (see 1st innovation Tanzania). When the group started, members did not see the direct benefits and motivation for their membership to the group. Some members dropped while other started to complain about the direct impact of the group to their lives and families. The group initiated the social fund for which group members raised money to be deposited in a separate group account. Each member contributed money to the account whereby the minimum contribution is $0.5 per month. The money is paid back to the group members at the end of year for their own use. The purpose of this initiative is to increase the group cohesiveness by saving in a joint account given that most members do not have running bank accounts.

The group members make additional voluntary contributions to support each other in incidents of illness, death and family ceremonies. The support provided by the group to the family members motivates the group members to remain part of the initiative. This has been the major strategy to keep the group members given that they have not been able to generate surplus from the waste collection activities. The fund raised by the group through this arrangement was also used to rent their office at the beginning when the initiative started. Interestingly, based on the same spirit of supporting the group one member provided them with the office at a subsidized rent of $25 instead of $40 which is charged to other clients.

4.6.3.2 STABILIZATION OF THE INNOVATION

The innovation has been working quite effectively from when they started it. The group is in the process of transforming their social fund into a revolving fund to enable members to borrow some money from the group at a subsidized rate of interest. They are negotiating with the bank and progress is good. Saving and lending practices to group members are developing for most community based organizations in Tanzania. However, the uniqueness of this innovation is a combination of saving with the family support. If the model develops successfully for the group, it will help to generate lessons on how to sustain waste picker groups and associations.

4.6.3.3 INCLUSIVITY OF THE INNOVATION

The innovation is owned by the group and all members have an opportunity to participate in saving. Group members are committed to support each other regardless of their level of income, age or family status. Poor families are included in the initiative and they benefit from the group contributions. Still, notwithstanding an increasing interest from other community members, the group has not opened up of other interested individuals to join their fund.

4.6.3.4 BOTTOM-UP DIFFUSION OF THE INNOVATION TO OTHER PLACES

Although the group collaborates with other groups (e.g. Kihonzile group), the innovation has not diffused to most existing groups. However, several emerging groups have initiated informal saving and credit arrangements which requires further follow-ups in future assessment.

4.6.4 YOUTH RETENTION IN THE INITIATIVE THROUGH EMPOWERMENT AND COACHING

Name of the initiative: Ikale Investment Company

Location: Tandale, Dar es Salaam

Name of researcher: Goodluck Charles

Type of innovation: Empowering and coaching waste pickers (youth) to create awareness and increase participation in the saving arrangement coordinated by the waste intermediary company.

4.6.4.1 DEVELOPMENT OF THE INNOVATION

Ikale Investment Company was established in 2011 as an intermediary service provider between the waste pickers and the recycling industries. It was set-up by Mr. Ikale after retiring from a company which was dealing with iron recycling. Currently, the company engages 10 youth and is managed by Ikale's son. The materials collected by company are plastic bottles, plastic bags, PVCs, iron, aluminium, cans & nylons. The company engages youth to collect waste materials from the streets and residential areas. However, one of the challenges the initiative faces is how to manage and retain the youth collecting waste materials. This is due to the fact that it is always difficult to organize them in terms where they operate and where they sleep. In addition, some youth tend to steal materials from other initiative's stores.

Because of the challenge of working with youth, Ikale created a register of the youth collecting materials and profiled them. *We know where they sleep, where they eat and most importantly how they spend their money,* claimed the owner. We always provide advice to them on effects of drug abuse and the best way of saving their income. We have developed a saving platform for them and most of them have established their income generating activities through this savings program, (one is running a small retail shop and the other has bought a wheel barrow for renting), he added. This saving platform works like a revolving fund because one may withdraw savings after 3 months, but not less than that. There is no specific amount of saving as one may put what is available and during the withdrawal one will get the amount so far accumulated. The company also help them when they face different disasters such as a funeral and disease. For us, this has created a strong bond and trust with them and

they play a role as the owners of this business, sometimes they help us to manage those who attempt to steal". We also provide them with life skills and support them to acquire the waste collection gear.

However, while our members have developed the right attitude, the biggest challenge is that youth from other initiatives steal their consignments. The next step is to support them to have the permanent transfer stations guarded by them in order to ensure that their consignments are not stolen and they reach us.

Photo 2: A youth owning a wheel barrow and renting to other guys for return of $1 per day with the data enumerator

4.6.4.2 STABILIZATION OF THE INNOVATION

So far, the innovation has worked for the group which is supported by the company. Currently, the money collected is kept by the owner of the company on behalf of the group. This works because the youth trust the owner and they claimed he is a very trustworthy person as he has never failed to pay their money when they needed it. Although this appears to be successful, the risk associated with the initiative is that it relies on one person. In future, they are planning to start the formal revolving fund that will be based on their savings and this will ensure their sustainability. When they start saving in the revolving fund they will open a bank account.

4.6.4.3 INCLUSIVITY OF THE INNOVATION

The idea of saving and building strong relation is highly supported by the youth themselves and they manage each other in terms of remitting their savings. Once someone goes against their agreement, they warn him/her and if he/she repeats the person is removed from the program and banned to bring materials to the initiative. On the other hand, other youth are requesting to join this initiative but they

hesitate to recruit new members as they don't have as much experience with them. To become a member, you must be a person well known by the group members.

4.6.4.4 OTHER INTERESTING CHARACTERISTICS OF THE ORGANISATION

The gender composition of the employees and youth is biased towards men with 90 percent men and 10% women. The main reason is that informal waste collection activities and dominated by men while women are found more in buying and selling waste. The nature of their operations also contributes to the dominance of men in the initiative. The company has a lot of support by the local government given the role they plan in cleaning the area.

5. CONCLUSION

The previous chapters have provided some insights on waste picker initiatives in 6 countries organizations. We have learned about the waste governance situation in these countries and have identified some interesting grassroots innovations, that have the potential to be adapted and up-scaled. The previous chapters have also evidenced numerous hurdles and barriers yet to overcome.

Waste picker organizations face many challenges in their formation. The following table (Tab. 5) identifies diverse sets of problems: situations of illegality, persecution and stigmatization of waste picker groups; social exclusion; lack of initial capital, machines, facilities or formal documents and permits; enclosure of landfills or banning of waste picking; challenges in the internal management connected to the construction of trust, transparency, management knowledge and the transition from an individual to a collective culture; market-related challenges regarding fluctuating prices for materials, high competition with large companies and other groups, operation in deprived neighborhoods with low income residents and low rates of payment, and barriers in the commercialization due to lack of initial knowledge of retailers, supply chain, low bargaining power; absence of a legal framework that recognizes and supports waste pickers' work; absence of technical, political, legal or financial incentives to expand the range of recyclable materials that are worth recovering and commercializing; or the threat of the introduction of incineration which would go in detriment of recycling practices.

Table 5: Challenges perceived by waste picker organizations

Resources	Lack of initial capital and capital to grow, lack of trust of financial institutions Machines donated often are not the solution: do not fit local requirements and are abandoned or break down Lack of necessary facilities (storage facilities causing environmental pollution), transportation, machines, tools Formalisation, lack of official documents (certifications, permits, formally constituted as cooperatives, that enable them to bid for contracts, to access loans, etc.)
Market	Fluctuating prices for materials, low profit, precarious working conditions, high member turnover Competition both with large companies and between groups (low prices, generating conflicts between groups) Low income settlements: customers not paying because of low income, luck of trust, lack of environmental awareness (illegal dumping) Commercialization (initial lack of knowledge of retailers, sales of materials, supply chain, low bargaining power, market price fluctuation)
Legislation	Legislation/illegality (impeding certain activities), polyethylene bag ban in Kenya, police persecution, harassment, bribes
Management	Internal conflicts, lack of trust, lack of group cohesion, lack of experience in administration, conflicts in leadership, bad leadership, bad management, absenteeism, lack of transparency, culture of working solo and lack of experience of collective management Social problems, e.g. alcoholism, conflicts Members' participation, absentees Different interests within youth groups

Social	Insufficient inclusion of women Unequal distribution of benefits, funds
Knowledge, identity	Knowledge and capacities (e.g. to treat machines, to reach retailers) Advocacy skills Stigmatisation / society's lack of knowledge of waste pickers and waste products, stigma associated with child labour, animal cruelty

Despite the many challenges that still prevail, the achievements are many, and a good number of them can be regarded as innovative, in terms of technology and product development, commercialization, alliances and governmental collaboration, social inclusion, management form, co-creation of knowledge and formation of identity. In the following tables (Tab. 2 and Tab. 3) we provide a summary of the innovation captured in our research. Processing machines for added value and transformation of materials, and the processing of new materials are examples of grassroots innovations in all cases at hand. While development of new products is also relevant, there were fewer examples (e.g. charcoal dust into briquettes in Kenya, *Reciplazas* children playgrounds equipment in Buenos Aires, jewelry in Nicaragua, cooking oil into combustion fuel, plastics into polymers in Sorrocaba, Brazil).

Our analysis of the interviews per country (Tab. 2 and 3) shows how partnerships with companies and contracts with local governments to provide waste collection services is common in Brazil, Argentina, Nicaragua and Tanzania; alliances between informal waste picker groups and formal SME in providing transportation and other services is an interesting development from Dar Es Salaam; community clean-ups as marketing and educational tools are typical in Kenya and Tanzania; internal management and women participation is particularly relevant in Brazil and Nicaragua. Training is generally provided in collaboration with NGOs but also as part of mentorship programs, as is the particular case in Kenya. In Tanzania, a number of social innovations extending benefits such as meals, accommodation or loans for employees is included as part of corporative social responsibility in the partnership between informal waste pickers and small companies involved in the waste management supply chain.

Table 6: Identified innovations through interviews by country and type of innovation

	Brazil	**Kenya**	**Tanzania**	**Nicaragua**	**Argentina**
Technology / product	Identification and processing new materials Factory of polymer and cooking oil into fuel	Processing materials (e.g. reuse of charcoal dust in briquettes) Processing machines for added value and transformation of materials (bailing machine) New products (.g. plastic fencing poles out of polyethylene bags, woven bags, mats and cushions) Transportation means (more hand carts)	Processing machines for added value and transformation of materials (e.g. crushing machines) Transportation means (e.g. compressor trucks) Identifying collecting new materials (e.g. e-waste)	New products (jewelry)	*Reciplazas*, children playgrounds furniture (more quality, durability and aesthetics than standardized production)
Commercialization	Reciclagem Popular (quality control of recycled materials) Floating capital to enable collective sales Partnerships with companies (e.g. PEAD Oil, COOPERCAPS, Fundação BB)	Community clean-ups (as marketing and educational tool) Clean-ups and health clinics educational tours Diversification of services (e.g. cleaning toilets in Nairobi in partnership with CCS, car washing, pit and septic tank emptying) Engaging landlords in waste collection Training hotels (street food restaurants) to sort out waste Marketing and social media Using youths for door-to-door sensitization Linkages with waste collection networks to obtain recyclable materials to better price	Selling to larger retailers Partnership with companies (e.g. Soyana) Locating operations in untouched markets (far from the city) Provide a regular collection service Payment system through bank account, EFD machine (avoiding un-payment) Educational material for customers (flyers)		
Management	Participatory decision making, self-management, transparency full access by members	Training in bookkeeping, team building, group management	Distributed leadership	Internal management, learning collective interests, unity, self-organization	
Alliances /governance	Contracts between local government and waste picker cooperative (e.g. Ounrihos) for selective waste collection	Training and capacity building in partnership with NGOs, Universities and governmental agencies Partnering with county government for transportation to the dumpsite		Partnership with local government and private companies (e.g. transportation by boat)	Alliance with NGOs and authorities

	Conversations and support network with other recycling networks				
Social	Creating low barrier work opportunities. Workers health improvement and risk reduction		Offering lunch, food, accommodation, loans for members Providing jobs for women, widows	Generating income for women	Creating products to improve low income neighbourhoods, children and people with disabilities
Knowledge **Identity**	Support and capacity building (e.g. accounting) through Instituto Catasampa & Rede Cata Vida Training program "recycler to recycler" Training and competences leads to empowering	Self-learning (identifying products and markets) Learning a profession: materials, supply chain, markets Partnership with NGOs for training and capacity building	Training members in customer service Overall training		

Table 7: Grassroots innovations classified by type of innovation

	Technology and product development	Commercialization	Alliances, government	Management	Social inclusion	Knowledge
Argentina						
Research and Development on non-marketable recyclables	X					X
Recycled playgrounds (Reciplazas)	X				X	
New Mind Product	X					
Professional Training Centre for Recycling Craft						X
Legal Framework for Large Waste Producers			X			
Artefact to disarm PET siphons	X					
Brazil						

Human Development of waste pickers					X	
Transparent governance and knowledge sharing			X	X		X
Social inclusion for the city's most vulnerable individuals (book, arts)					X	X
Alternative organization of cart pushers and waste pickers					X	
Grassroots education and pedagogy					X	X
Innovation Rede Catasampa, excellence, certification, commercialization		X	X	X		X
Legal and administrative support to organized waste pickers		X				
Nicaragua						
Networking and Governance			X			
Gender inclusiveness					X	
Kenya						
Scrap innovations, crushing bones	X					
Sorting, processing, transportation	X					
Shredding of high density plastics	X					
From market trading to composting	X					
Making of cards, gift boxes, book marks from recycled paper, ornaments from recycled metal scrap	X					
Scrap metal recycling	X					
Recycling of plastic bags and industrial waste	X				X	

Tanzania						
Collaborative governance and financial control			X	X		
Negotiating and lobbying for work space and better prices for members		X	X			
Social fund and family support to group members					X	
Capturing value locally	X					
Empowerment and capacity building of waste collection groups						X
Youth retention in the initiative through empowerment and coaching						X

Technology / product	Identifying, collecting and processing new materials (e.g. charcoal dust in briquettes, e-waste) Processing machines for added value and transformation of materials (e.g. bailing, crushing machines) Developing new products (charcoal dust in briquettes, *Reciplazas* children playgrounds equipment jewelry) New transportation means (more hand carts, compressor trucks) Table banking, self-groups, collective/crowd funding
Commercialization	Partnership with companies Community clean-ups as marketing and educational tool Diversification of services (e.g. car washing, pit and septic tank emptying) and waste services Engaging landlords in waste collection Recruiting local members to gain trust in the neigbhourhood Training companies and households to sort out Marketing and social media Using youths for door-to-door sensitization Linkages with waste collection networks to negotiate prices Selling to larger retailers Locating operations in untouched markets To provide a regular collection service Payment system through bank account Educational material for customers
Management	Participatory decision making Self-management, team building, group management Transparency, full access by members Training in bookkeeping Distributed leadership Learning about collective interests and unity
Alliances / government	Contract per collection subsidies by local governments, partnering with local government for transportation and transfer stations Conversations with other recycling networks Alliances with NGOs for training Collegiality, mentorship, collaboration model between fellow waste companies; network/association formation

Social	Offering lunch, food, accommodation, loan for members Providing jobs for women (employed or members of cooperatives) Creating products to improve low income neighbourhoods (clean-ups, children play grounds, and people with disabilities
Knowledge / identity	Training and capacity building in partnership with NGOs, Universities and governmental agencies Self-learning (identifying products, markets, suppliers) Training members in customer service Mentorship programs (recycler to recycler)

The following table provides a final overview of those innovations identified in our research with the potential for dissemination and upscaling (Tab. 8).

Table 8: Innovations with potential for dissemination and upscaling