



An Inclusive Recovery

The Social, Environmental,
& Economic Benefits of Partnering
with Informal Recyclers



#Beyond Recovery

Introduction

The COVID-19 pandemic has severely destabilized economies all over the world. The World Bank estimates that between 88 and 115 million people will fall into extreme poverty as a result of the pandemic.¹

The informal sector, representing 60% of the global workforce,² is particularly vulnerable, having been affected to a greater extent by this pandemic than by any previous global crisis.³ While the informal sector may be at its most fragile state, deploying recovery funds towards this sector represents an opportunity for governments to better fulfill their responsibilities.

Economic recovery, job creation, and poverty alleviation are currently at the top of government agendas all over the world. Meanwhile, we continue to face a global waste crisis, which can be mitigated through zero waste solutions – solutions that would address the very issues governments are currently seeking to solve. By applying funds dedicated to economic recovery towards fully integrating – as described in this document- and fully developing the potential of informal recyclers a sector that has become the cornerstone of recycling in Global South cities, many local governments have an opportunity to simultaneously alleviate urban poverty and transition towards zero waste systems that would not only reduce waste and unemployment but also create more social and environmental welfare.



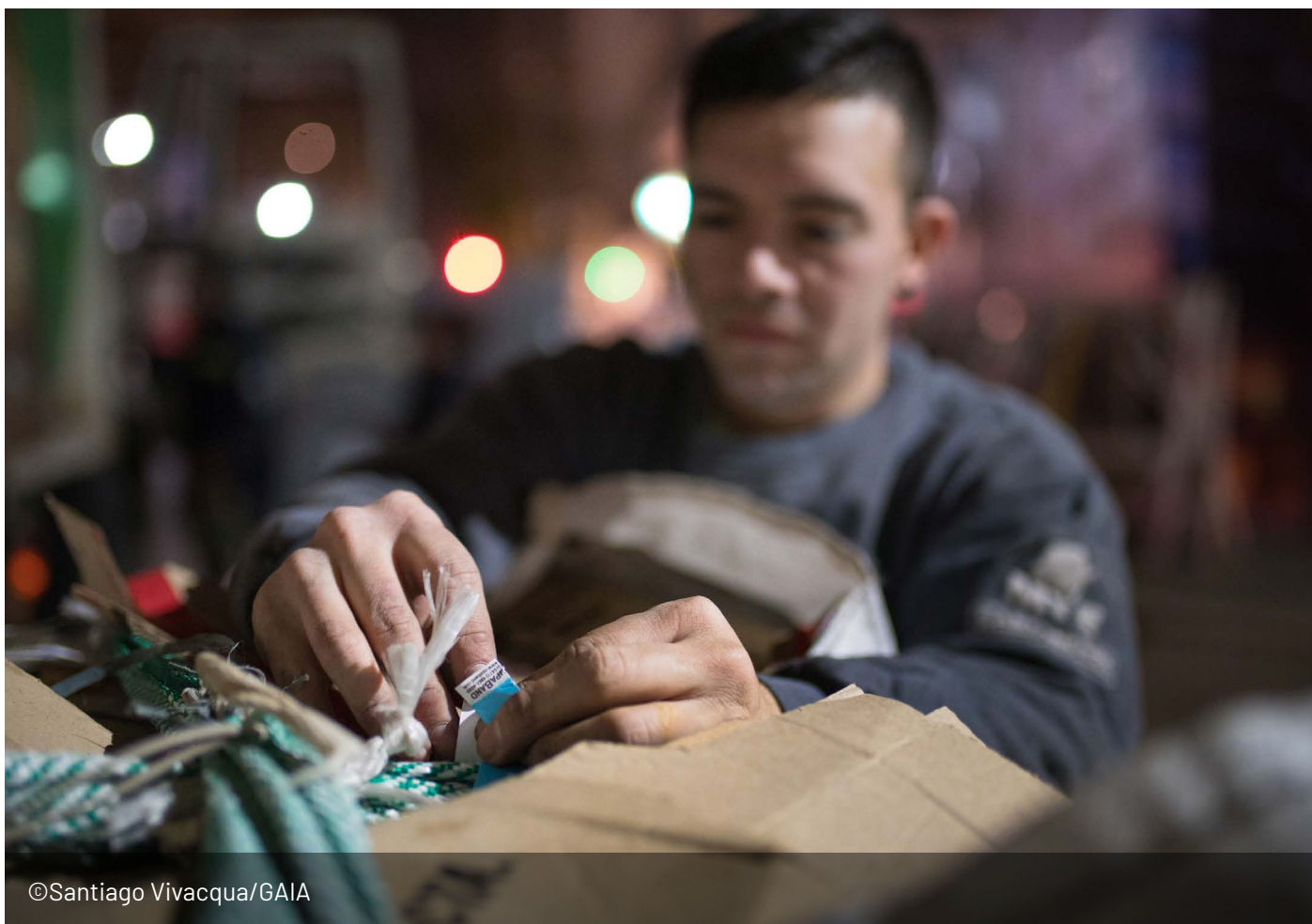
©Santiago Vivacqua/GAIA

Key Figures:

- Between 12.6 & 56 million people work in the informal recycling sector
- Accounting for 19% of municipal budgets on average, waste management is the single largest expense of most municipalities in the Global South
- The percentage of waste that is disposed of instead of usefully recycled or composted reaches up to 96% in Latin America and the Caribbean, 93% in sub-Saharan Africa, and 79% in South Asia
- Recycling rates achieved by the informal sector range from 20 to 50% in China, Pakistan, India, and the Philippines; informal recyclers collect 90% of what is recycled in Brazil and 80 to 90 % of post-consumer packaging and paper recovered in South Africa
- The job creation potential for inclusive recycling systems is estimated to be on average 321 jobs per 10,000 tonnes per year of recyclables

Key Takeaways:

- Inclusion of informal recyclers and the zero waste systems they advance results in:
- Quantifiable savings in waste management and reduced social assistance costs
 - Better environmental outcomes by extending the life of disposal sites and reducing greenhouse gases
 - Greater economic and social justice for an important percentage of the population performing an essential service
 - A powerful foundation upon which governments can dynamically transition towards a zero waste future



©Santiago Vivacqua/GAIA

Informal recyclers & their current context

Informal recyclers—people who collect, sort, and process recyclable and compostable materials in the informal economy—have been seriously impacted by the pandemic, partly because of pre-existing poor working conditions that made them more vulnerable. During the 2020 lockdowns, recycling systems were suspended for months, waste pickers were not allowed to work in many cities, and the recycling market was seriously damaged.^{4,5} Before the pandemic, it was estimated that between 12,⁶ and 56 million people worked in the informal recycling sector.⁶ Given that economic downturns tend to dramatically increase the number of people involved in waste picking, the current figures are probably higher.

Informal recyclers have either put in place or scaled up a service that was non-existent or very incipient in many municipalities—most often with very little or

no support and in the face of harassment and threats. Throughout the years, they have become a key player in the recycling chain in the Global South, bringing about positive economic, social, and environmental impacts. While in many places informal recyclers have organized themselves and managed to improve their livelihoods as a result, they are largely still working under very precarious conditions. Their primary demand is inclusion in municipal recycling policies. This inclusion will not only upgrade their working conditions but also provide a way out of poverty and improve their overall quality of life, through a recognized job, higher and stable income, social benefits, and the possibility to better develop their skills and build new ones. It will also benefit their children by reducing the economic pressure for them to contribute to family income.

The role of informal recyclers in zero waste

Local governments in Global South cities are well aware of the problems associated with poor waste management, and many are looking for solutions. The percentage of disposed waste, instead of usefully recycled or composted, reaches up to 96% in Latin America and the Caribbean, 93% in sub-Saharan Africa, and 79% in South Asia.⁷ Disposal sites represent a time-bomb for local governments, ready to trigger conflict once communities rise up to denounce their environmental health impacts or when the sites reach their capacity and a new location needs to be found.

The situation looks even more complex given that waste management is the single largest expense of most municipalities in the Global South, accounting for 19% of municipal budgets on average.⁸ This begs the question of why the single largest expense of already stretched municipal budgets is not used in a more virtuous way.

Recyclers have a central role in zero waste systems. Zero waste is an approach to municipal solid waste management that seeks to progressively reduce waste disposal—in dumps, landfills, and incinerators—by implementing policies and programs

to prevent waste generation in places with high waste production, redesigning wasteful and toxic products, and through the reuse, repair, recycling, and composting of all discards. This shift from linear waste systems to circular systems has great potential for both economic recovery and social justice.

In many places, recycling is the entry point to the zero waste path, that is later supplemented with other measures focused on recovering organics and reducing waste upstream. Currently, informal recyclers are central to waste collection, the processing of recyclable materials, and education and outreach activities. In certain places they also play a role in treating organic waste. Yet, as zero waste systems are people-powered, their role could be further extended to other activities including repair, research, public officers, etc.

Informal recyclers are thus essential to a just transition towards zero waste, and their expertise and level of organization—at local, national and international levels—in fact presents a foundation upon which governments can build a more equitable and resilient system.



A worker at a material recovery facility in Tacloban, Philippines is putting collected cans into a bag.
©Rommel Cabrera/GAIA



The informal sector as the cornerstone of recycling

The informal sector is the basis of the recycling chain in the Global South.⁹

- **In South Africa**, it is estimated that waste pickers recover between 80 to 90% of the post-consumption packaging and paper.¹⁰
- **In Brazil**, the approximately 600 cooperatives organized under the National Waste Pickers Movement (MNCR) are responsible for collecting 90% of all material recycled in the country.¹¹
- **In India**, it is estimated that waste pickers recycle 54% of all recycled glass, 34-45% of all recycled plastic, and 28-50% of all recycled cardboard and mixed paper.¹²
- A study from **China** states that informal recyclers collect 70-80% of all recyclable materials in the city of Nanjing.¹³

- Studies indicate that the recycling rates achieved by the informal sector range from 20 to 50% **in China, Pakistan, India**, and the **Philippines**, to up to 80% **in Cairo, Egypt** when the service was managed by waste pickers.¹⁴

The informal sector is also a key supplier of materials to the recycling and remanufacturing sectors in many countries. **In Latin America** and **the Caribbean**, it is estimated that the informal sector provides 50-90% of the recyclable materials that are used by local industry or exported, yet only receives 5% of the profits.¹⁵

It is therefore fair to recognize that the informal sector currently subsidizes the recycling industry, absorbing costs that in the wealthier countries are borne by the corporations who put recyclable materials on the market, or by governments.



Latin America and the Caribbean:

The informal sector provides an estimated 50–90% of recyclable materials, yet only receives 5% of the profits.

©Santiago Vivacqua/GAIA



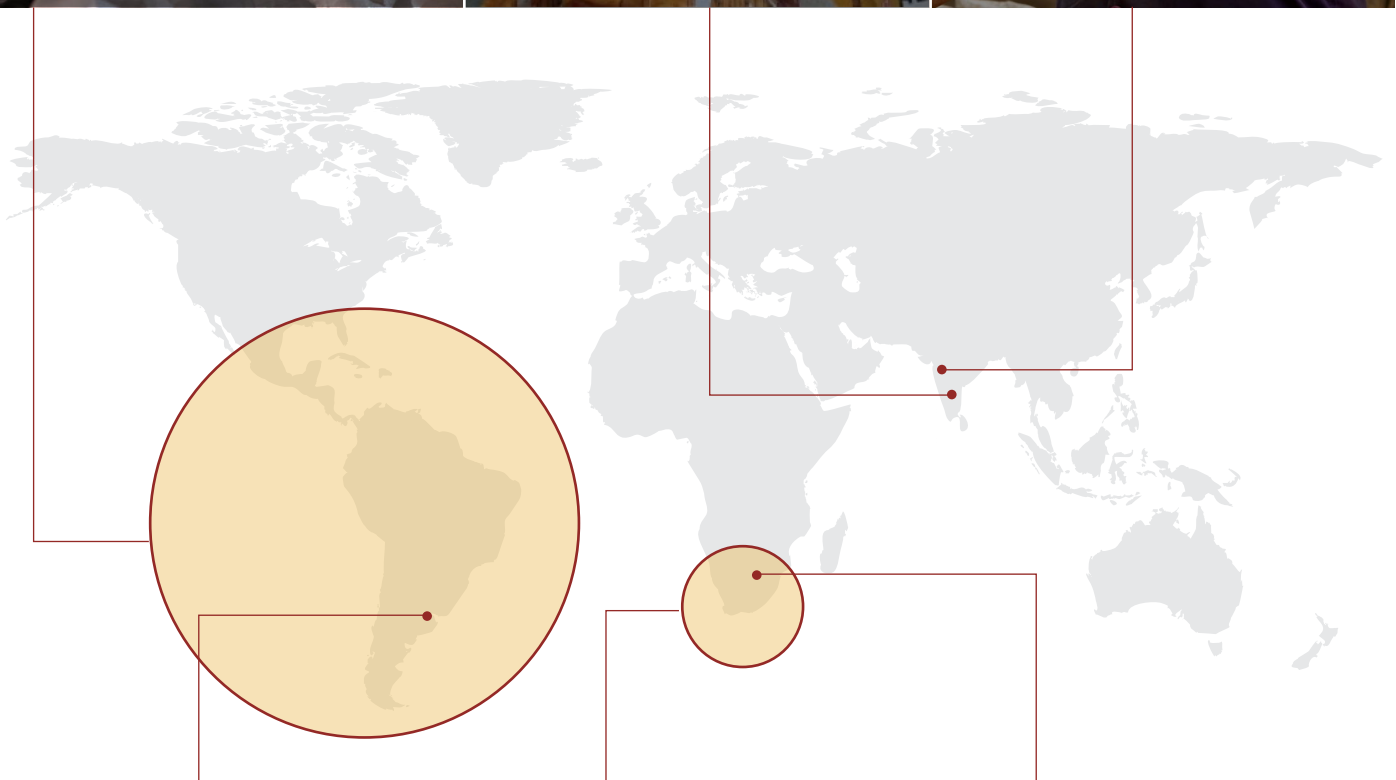
Bengaluru, India : Hasiru Dala Innovations provides waste collection and environmental education service to 30,000 households, with a source separation rate of 90% and diversion rate of 80%.

©Hasiru Dala Innovations



Pune, India: The SWaCH cooperative provides source segregated door-to-door waste collection service to over 840,000 households, collecting almost 400,000 tonnes of waste per year.

©Brodie Lewis



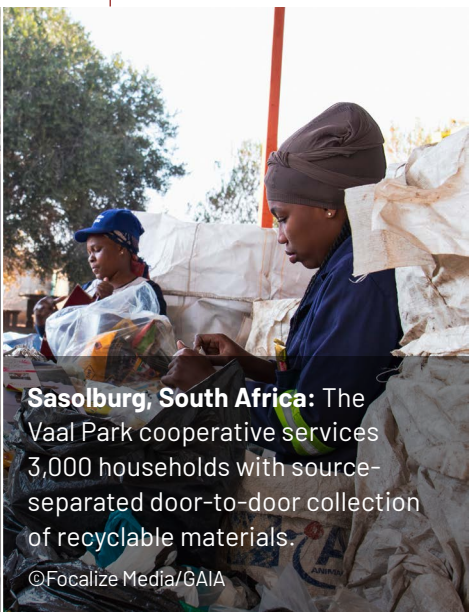
Buenos Aires, Argentina: The recycling system is run by 12 waste picker cooperatives contracted by the government managing 5,300 registered workers.

©Santiago Vivacqua/GAIA



South Africa: Waste pickers recover between 80 to 90% of the post-consumption packaging and paper.

©Focalize Media/GAIA



Sasolburg, South Africa: The Vaal Park cooperative services 3,000 households with source-separated door-to-door collection of recyclable materials.

©Focalize Media/GAIA

How cities can benefit from transitioning to inclusive zero waste systems

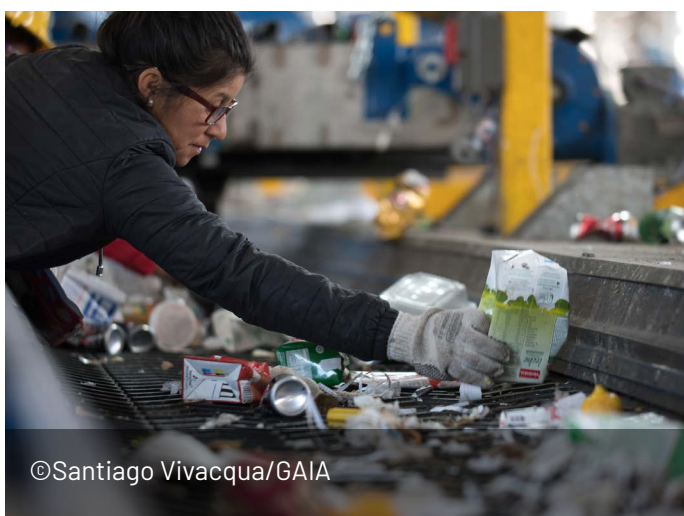
More cost-effective than incinerators



©Rommel Cabrera/GAIA

While incinerators are marketed around the world, inclusive zero waste systems are much more affordable than waste-to-energy incinerators.¹⁶ In addition to the negative environmental and health impacts associated with these plants, incinerators lock municipalities into burning valuable materials for at least 30 years, at very high costs, while creating very few jobs and destroying many. Construction costs of these plants range from USD 600 to USD 1,000/ton of installed capacity for incinerators with high pollution control standards, and they create as few as 1.7 jobs/10,000 tonnes per year.¹⁷

More cost-effective than privatization of waste management

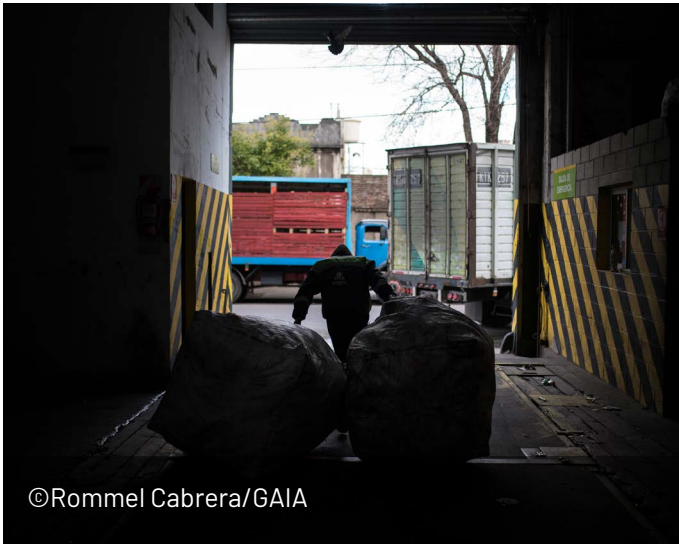


©Santiago Vivacqua/GAIA

Privatization of waste management through private companies is often offered to cities, but tends to be expensive for local governments and exclude those already doing the job.¹⁸ On the other hand, the experience of many cities that have partnered with waste pickers shows that inclusive practices actually reduce waste management costs. Based on data by Women in Informal Employment: Globalizing and Organizing (WIEGO), the switch from private contractors to inclusion of informal recyclers in Bogotá, Colombia, reduced waste management spending by 11%; the city of Cairo, Egypt, saved 14.5

million euro/year when waste pickers managed the recycling system; Diadema, in Brazil, saves USD 10,000 per month thanks to waste pickers' work¹⁹, and SWaCH cooperative in Pune, India provides a waste management service to the city that costs less than one-fifteenth of what it costs in other cities in the country.²⁰ Another study analyzed 8 scenarios in Latin American cities where recyclables collection, transport, sorting, and processing were run by municipalities, private companies, by informal recyclers associations, or by a mix of those actors. The study did not find correlation between the costs of the system and the actor that runs them; yet the scenario with higher costs was the one run entirely by private companies and where containers are used to store recyclables (instead of door-to-door collection).²¹ Privatization of waste management, especially in cities where waste pickers already collect recyclables, is furthermore a source of conflict and has been shown to negatively impact recycling rates while increasing poverty. For instance, the recycling rate in Cairo decreased by 20% when a private company took over collection previously done by waste pickers.²²

Millions saved in transport and disposal costs



©Rommel Cabrera/GAIA

Processing recyclable materials within cities avoids transportation and disposal—and their associated costs—in dumps and landfills, typically located in the outskirts. In South Africa, it is estimated that the work of informal recyclers' cooperatives saves municipalities USD 40 million a year in disposal costs.²³ Another study of Nanjing, China found that waste pickers save the city USD 17.6–22 million in municipal solid waste disposal costs annually.²⁴ In addition, while 2 billion people are estimated to lack access to solid waste collection,²⁵ governments deal with a complex situation that informal collectors are currently helping alleviate.

Lifespan of disposal sites extended



©Rommel Cabrera/GAIA

The recovery of materials carried out by the informal sector extends the lifespan of dumps and landfills. In most countries, informal waste workers focus on recovering recyclable materials—which can represent 20 to 30% of total municipal solid waste saved from landing in disposal sites. In places where they receive external support, they also collect source-separated

organics for composting or anaerobic digestion. Organics are the largest component of the waste stream (above 50%) in Global South countries²⁶—with the inclusion of informal waste workers, cities could more than double the life of disposal sites by source-separated organics.

Reduction of greenhouse gas emissions



According to estimates by the Global Alliance of Waste Pickers and WIEGO, the recyclers working at the Mbeubeuss dump in Dakar, Senegal, prevent the emissions of almost 32,000 tonnes of CO₂e a year by avoiding degradation of materials in the site. In turn, the cooperative Amanecer de los Cartoneros, in Buenos Aires city, Argentina, prevents the emissions of about 69,000 tonnes of CO₂e per year by allowing substitution of recyclable materials for raw ones, plus 43,000 tonnes of CO₂e per year by avoiding open burning of materials and 157 tonnes of CO₂e per year by using manual carts instead of trucks.²⁷ In Pune, India, the door-to-door collection and materials processing service provided by SWaCH waste pickers cooperative has a GHG emission impact equivalent to removing annual emissions from 39,195 passenger vehicles.²⁸

Poverty is stymied



The work of waste pickers often serves as a cushion for extreme poverty. In times of crisis, income from the sale of recyclables helps combat hunger in places out of the government's reach. "Pag walang basura, walang pera, walang pagkain" ("If there is no trash, there is no money, there is no food"), says a recycler who lives next to the Payatas landfill, in Quezon City, Philippines, a country where 30% of households, or around 7.6 million, have suffered from involuntary hunger in 2020.²⁹ Privatization of waste management systems creates competition for materials between the private companies and waste pickers, who still depend on recyclables for a living. A study of waste picker communities in Okhla, Delhi, India concluded that waste pickers are unlikely to change fields when faced with challenges to usual income generation from waste; they simply continue working in worse conditions. Changes in income are compensated for by longer hours, collection in neighboring communities, reductions in standards of living, and in some cases, the increase of child involvement in waste picking to generate income.³⁰

Preservation of social fabric



©Rommel Cabrera/GAIA

Many informal recyclers associations sustain soup kitchens and child-care centers, and represent a nexus between marginalized communities and their governments, channeling policies designed for the sector and submitting plans to the government oriented at improving living conditions of the poorest. For instance, the Union of Workers in the Popular Economy in Argentina (UTEP), representing waste pickers among other informal workers, submitted

to the government an Integral Human Development Plan aimed at creating 4 million jobs in the popular (informal) economy, including the recycling sector, to mitigate the economic impacts of the pandemic.³¹ In India, it has been noted that recognizing informal recyclers collecting discarded materials door-to-door as legitimate public servants resulted in a better interaction between classes, castes, and genders, helping strengthen the social fabric.

The above statistics demonstrate that the initial start-up costs to municipalities of including informal workers can quickly result in waste management savings while also alleviating poverty, thus reducing other public expenses associated with social assistance while prioritizing social justice and inclusion.³² Savings in the waste sector come from reduced transportation and disposal costs, incomes from sale of recyclables, reduced collection costs -as door-to-door collection replaces expensive containers- and more economically efficient, socially inclusive, and environmentally sustainable systems than those with private companies. Savings should never come from underpayment or worsening of labor conditions. The current economic crisis is a wake-up call to invest in a transition towards economies that are socially just, and environmentally and economically resilient.

Job creation potential of the informal sector

Local governments can invest in improving their waste management systems through zero waste approaches and, at the same time, create local jobs. This can be done by recognizing the role that informal recyclers already play, and partnering with them to provide better recycling and composting services.

The potential for job creation is significant. Based on data from a number of cities that contract with waste pickers, the average number of jobs created by inclusive waste management systems is **321 jobs per 10,000 tonnes per year of recyclables, compared to 1.8 jobs per 10,000 tonnes per year sustained by landfills.**



Buenos Aires, Argentina: 184 jobs/10,000 annual tonnes.³⁴

resulting from a recycling system run by 12 contracted waste picker cooperatives managing **6,500** registered workers



Londrina, Brazil: 302 jobs/10,000 annual tonnes.³⁵

resulting from city government contracts with seven waste picker cooperatives who run the collection, processing, and sale of recyclable materials



Dois Irmãos, Brazil: 288 jobs/10,000 annual tonnes.³⁶

resulting from a waste picker organization that collects all waste, processes recyclables for sale, and provides consultancy services to clients to improve waste management



Peñalolén, Chile: 555 jobs per 10,000 annual tonnes.³⁷

resulting from an inclusive system that provides waste pickers collecting recyclables door-to-door with identity cards, vests, and earnings of **1.3-2.5 times** the minimum wage



Bengaluru, India: 304 jobs per 10,000 annual tonnes.³⁸

resulting from the **200** workers employed—formerly waste pickers—at Hasiru Dala Innovations, which provides waste collection and environmental education services to **30,000** households, with a source separation rate of **90%** and diverting from landfills **80%** of what they collect. Their employees earn double to triple of their previous income

The opportunities that economic recovery funds and other funds available for waste and climate initiatives represent should be used to upgrade the working conditions of those already doing this essential work and not as a way to save money by only maintaining a service done by recyclers under very poor conditions. Almost all of the success inclusion stories are a result of waste pickers organising themselves, demanding integration and demonstrating various alternatives to

governments. It is now time for local governments to step up and support inclusion proactively.

Waste picker groups in different regions have acquired an extensive know-how that could help pave the way for governments who want to implement zero waste systems:



In Pune, India, the SWaCH cooperative provides source segregated door-to-door waste collection service to over **840,000** households, collecting almost **400,000** tonnes of waste per year through a contract with Pune Municipal Corporation, and employing **3,500** waste pickers.³⁹



In Sasolburg, South Africa, the Vaal Park cooperative services **3,000** households with source-separated door-to-door collection of recyclable materials.⁴²



In the Philippines, the City of San Fernando hired informal waste workers to be part of their zero waste system, performing the tasks of collection, street sweeping, waste classification, and management of the materials recovery facility. The city has surpassed the **80%** waste diversion rate from landfill, and provided salaries and better working conditions to contracted workers.⁴³



In Buenos Aires, Argentina, a city with a population of **3 million**, the recycling system is run by **12** waste picker cooperatives, hired by the city government, that collect recyclables door-to-door, run **16** sorting centers, and educate citizens about source separation an example of a system co-managed jointly by the waste pickers cooperatives and the local government.⁴⁰ At national level, a former waste picker is currently the National Director of Informal Economy, and she manages a program focused on supporting waste pickers in the country by providing equipment, improving sales conditions, and adding value to collected materials.⁴¹

Partnering with the informal sector: people power to improve waste management

There are many ways to begin including the informal sector, and they all start by engaging informal workers in the planning of an inclusive system and understanding their needs and demands. The path to inclusion is not easy and often requires the consideration of issues outside of the usual purview of municipal waste departments—including access to health care, child labor eradication, support for migrant workers, and others—so interaction with relevant government departments on these issues is key.

Some of the inclusive policies that have been successfully implemented include³³:

- Identification, enumeration and registration: organizing census to register and assess their needs, providing identity cards to legitimize their work
- Organize trainings, give personal protective equipment and uniforms
- Issue legislation that recognizes them as a legitimate actor in the waste management service
- Provide spaces to store and sort materials
- Allow them to charge a user fee for waste collection and processing
- Provide facilities and equipment to collect and process materials, such as carts, conveyor belts, bales, forklifts, or funds to purchase.
- Support or facilitate setting of day care centers for their children, inclusion in the education system, access to health care and identity cards.
- Contract them or partner with them as waste management service providers for recyclables, organics or all waste streams, paying fair salaries and benefits as well as the costs for the service they provide (as it happens with any other service provider). These services can be for door-to-door collection, recyclables sorting and processing, implementation of compost and anaerobic digestion systems in situ, education and outreach for citizens, or more.

These steps reflect different levels of inclusion, but the key is to invest systematically in the informal recycling sector to guarantee their rights. Ultimately, local governments should recognize the role that this sector has in recycling and reducing waste to landfill, and pay for that service or allow them to charge a user fee. Source-separated organics collection and treatment (e.g., composting) may not be a self-sustaining business model and might require an ongoing public subsidy. However, this subsidy is generally less than the cost of the city disposing this waste itself and generates important employment, public health, and climate benefits that could not otherwise be realized.

As start-up costs may require new funding for those municipalities that do not have a budget for waste management or have already allocated their budgets to contracts, local governments today have an opportunity to apply for any economic recovery fund available to help them create jobs and eliminate waste through local zero waste systems. Likewise, agencies that disburse funds for economic recovery and climate projects should see the benefits of supporting the work of informal recyclers, increase their funding to inclusive zero waste systems, and also offer the possibility for waste pickers to apply directly to these funds.

With waste management accounting for the largest expense for municipal budgets, it is time for governments to recognize the essential service informal recyclers have been performing and capitalize on the social, environmental and economic benefits that investing in these services will bring to cities and communities all over the world.



©Rommel Cabrera/GAIA

Acknowledgements

This report is authored by Cecilia Allen. Research was supported by John Ribeiro-Broomhead. It was edited by Natasha Naayem and designed by Shanthony Art & Design. Other contributors and reviewers include Miko Aliño, Niven Reddy, Claire Arkin, Doun Moon, Sherma Benosa, Neil Tangri, Felicia Dayrit, Christie Keith, Magdalena Donoso, and Monica Wilson at GAIA; as well as Lakshmi Nayaran at KKP KP, Musa Chamane at groundWork, Betty Osei Bonsu at Green Africa Youth Organization, and Mariana Nascimento.

This report has been made possible in part through funding from Plastic Solutions Fund. The views expressed in this publication do not necessarily reflect those of Plastic Solutions Fund.

www.doi.org/10.46556/VPKH5682

Endnotes

- 1** Lakner, Ch. et al. (2020). Updated Estimates of the Impact of COVID-19 on Global Poverty: The Effect of New Data. World Bank blog. <https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-poverty-effect-new-data>
- 2** International Labour Office. (2018). Women and Men in the Informal Economy: a Statistical Picture (third edition). https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_626831.pdf
- 3** International Labour Organization. (2020). ILO Monitor: COVID-19 and the World of Work (sixth edition), page 5. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms_755910.pdf
- 4** Arora, K. (2020). Post-COVID 19 Lockdown Forecast for the Informal Recycling Sector and Suggestive Interventions to Help in the Long Term. Hasiru Dala. <https://wastenarratives.com/2020/05/11/post-covid-19-lockdown-forecast-for-the-informal-recycling-sector-and-suggestive-interventions-to-help-in-the-long-term/> Dias, S., Abussafy, R. Gonçalves, J. and Martins, J.P. (2020). Overview of the Impact of the COVID-19 Pandemic on Inclusive Recycling in Brazil. WIEGO. <https://www.wiego.org/publications/overview-impact-covid-19-pandemic-inclusive-recycling-brazil>
- 5** GA Circular (2020). Safeguarding the Plastic Recycling Value Chain: Insights from COVID-19 Impact in South and Southeast Asia. Commissioned by Circulate Capital https://1b495b75-5735-42b1-9df1-035d91de0b66.filesusr.com/ugd/77554d_6464ccce8ff443b1af07ef85f37caef5.pdf
- 6** Linzner, R. and Lange, U. (2013) Role and Size of Informal Sector in Waste Management – a Review. Waste and Resource Management. https://www.researchgate.net/publication/274347188_Role_and_size_of_informal_sector_in_waste_management_-_a_review
- 7** Kaza, Silpa, Lisa Yao, Perinaz Bhada-Tata, and Frank Van Woerden. (2018). What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050, page 35. World Bank.
- 8** Kaza, Silpa, Lisa Yao, Perinaz Bhada-Tata, and Frank Van Woerden. (2018). What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050, page 102. World Bank.
- 9** Grau, J. et al: (2015). Situación de la Gestión de Residuos Sólidos en América Latina y el Caribe. BID. <https://publications.iadb.org/es/situacion-de-la-gestion-de-residuos-solidos-en-america-latina-y-el-caribe>
- 10** Godfrey, L., Strydom, W. and Phukubye, R. (2016). Integrating the Informal Sector into the South African Waste and Recycling Economy in the Context of Extended Producer Responsibility. GSIR. https://www.csir.co.za/sites/default/files/Documents/Policy%20Brief_Informal%20Sector_CSIR%20final.pdf
- 11** WIEGO. (2013). Waste Pickers: The Right to be Recognised as Workers. <https://www.wiego.org/sites/default/files/resources/files/WIEGO-Waste-Pickers-Position-Paper.pdf>
- 12** Estimated based on: Nandy, B. et al. (2015). Recovery of Consumer Waste in India – A Mass Flow Analysis for Paper, Plastic and Glass and the Contribution of Households and the Informal Sector. Resources, Conservation and Recycling. 101, 167-181. <https://doi.org/10.1016/j.resconrec.2015.05.012>
- 13** Chen, F. et al. (2018). Enhancing Municipal Solid Waste Recycling Through Reorganizing Waste Pickers: A Case Study in Nanjing, China. Waste Management and Research. 6(9):767-778. doi: 10.1177/0734242X18766216.
- 14** Wilson et al. (2009). Building Recycling Rates Through the Informal Sector. Waste Management. <https://doi.org/10.1016/j.wasman.2008.06.016>

- 15** Yuen, M. and Estay, E. (2015). Catastro Socio Laboral de Recicladores de la Región Metropolitana. IRR. https://latitudr.org/wp-content/uploads/2019/02/09_Chile_CasadelaPaz_CatastroSocioLaboral_Recicladores_R-1869.pdf
- 16** Kaza, Silpa, Lisa Yao, Perinaz Bhada-Tata, and Frank Van Woerden. (2018). What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. World Bank. page 35.
- 17** Ribeiro-Broomhead, J. & Tangri, N. (2021). ZeroWaste and Economic Recovery: The Job Creation Potential of Zero Waste Solutions. Global Alliance for Incinerator Alternatives. www.doi.org/10.46556/GFWE6885
- 18** WIEGO. (2015). Just Recycling: The Social, Economic and Environmental Benefits of Working with Waste Pickers. <https://www.youtube.com/watch?v=SfHUWA5dTZ4&t=120s>
- 19** WIEGO. (2015). Just Recycling: The Social, Economic and Environmental Benefits of Working with Waste Pickers. <https://www.youtube.com/watch?v=SfHUWA5dTZ4&t=120s>
- 20** WIEGO. (2019). In India, Pune's Poorest Operate One of the World's Most Cost-effective Waste Management Models. <https://www.wiego.org/blog/india-pune%E2%80%99s-poorest-operate-world%E2%80%99s-most-cost-effective-waste-management-models>
- 21** Correal, L. and Laguna, A. (2018) Estimación de Costos de Recolección Selectiva y Clasificación de Residuos con Inclusión de Organizaciones de Recicladores Herramienta de Cálculo y Estudios de Caso en América Latina y Hi Caribe. Nota Técnica 01433, BID.
- 22** WIEGO. (2015). Just Recycling: The Social, Economic and Environmental Benefits of Working with Waste Pickers. <https://www.youtube.com/watch?v=SfHUWA5dTZ4&t=120s>
- 23** 750 million rands. Source: Godfrey, L., Strydom, W. and Phukubye, R. (2016). Integrating the Informal Sector into the South African Waste and Recycling Economy in the Context of Extended Producer Responsibility. GSIR. https://www.csir.co.za/sites/default/files/Documents/Policy%20Brief_Informal%20Sector_CSIR%20final.pdf
- 24** Chen, F. et al. (2018). Enhancing Municipal Solid Waste Recycling Through Reorganizing Waste Pickers: A Case Study in Nanjing, China. Waste Management and Research. 6(9):767-778. doi: 10.1177/0734242X18766216.
- 25** UNEP. (2015) Global Waste Management Outlook. United Nations Environment Programme, 2015
- 26** Kaza, Silpa, Lisa Yao, Perinaz Bhada-Tata, and Frank Van Woerden. (2018). What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. Urban Development Series. Washington, DC: World Bank. doi:10.1596/978-1-4648-1329-0.
- 27** WIEGO and Global Alliance of Waste Pickers. (2019). Reducing Greenhouse Gas Emissions through Inclusive Recycling Methodology and Calculator Tool. <https://www.wiego.org/sites/default/files/resources/file/COP%20GHG%20Methodology%20English%20for%20web.pdf>
- 28** SWaCH (2018). Environmental Impact of SWaCH Waste-Pickers in Pune City. <https://swachcoop.com/about/impact/>
- 29** Zambrano, C. (2020). Facebook Post. <https://www.facebook.com/chiarazambrano/posts/10162036610229815>; see also SWS September 17-20, 2020 National Mobile Phone Survey <https://www.sws.org.ph/swsmain/artcldisppage/?artcsyscode=ART-20200927135430>.
- 30** Chintan Environmental Research and Action Group. (2011). Waste-to-Energy or Waste-of-Energy?. https://www.chintan-india.org/sites/default/files/2019-08/chintan_waste_to_energy_or_waste_of_energy.pdf

- 31** Plan de Desarrollo Humano Integral. (2020). <https://plandesarrollohumanointegral.com.ar/>
- 32** See, for instance: Dayrit, F. (2019). Picking up the Baton: Political Will Key to Zero Waste. Zero Waste Cities, Asia Series. Global Alliance for Incinerator Alternatives. <https://zerowasteworld.org/wp-content/uploads/San-Fernando.pdf>
- and Liamzon, C. (2019). Sunshine After the Storm: A Typhoon-Ravaged City Rises to Become Zero Waste. Zero Waste Cities, Asia Series. Global Alliance for Incinerator Alternatives.
- 33** For more information, visit the site of the Global Alliance of Waste Pickers <https://globalrec.org/> and Women in Informal Employment: Globalizing and Organizing (WIEGO) <https://www.wiego.org/>
- 34** GAIA. (2019). Inclusion of Waste Pickers in Zero Waste Programs. <https://zerowasteworld.org/wp-content/uploads/Seria-docuemntos-GAIA-Caso-4-ingles.pdf>
- 35** Moraes, E., Vinícius, M.C.: Londrina Recicla em dados - 2012-2017. Prefeitura de Londrina, Companhia Municipal de Trânsito e Urbanização, 2018.
- 36** Danielson, J. (2020). Leave No Trace: Vital lessons from pioneering organisations on the frontline of waste and ocean plastic. Vital Oceans/SYSTEMIQ, TriCiclos, Hasiru Dala.
- 37** Danielson, J. (2020). Leave No Trace: Vital lessons from Pioneering Organisations on the Frontline of Waste and Ocean Plastic. Vital Oceans/SYSTEMIQ, TriCiclos, Hasiru Dala.
- 38** Hasiru Dala Innovations. <http://map-sa.net/Document/Doc/Hasiru.pdf>
- 39** SWaCH. (2021). <https://swachcoop.com/>
- 40** GAIA. (2019). Inclusion of Waste Pickers in Zero Waste Programs. <https://zerowasteworld.org/wp-content/uploads/Seria-docuemntos-GAIA-Caso-4-ingles.pdf>
- 41** María Castillo. (2020). El Reconocimiento del Estado Hacia el Sector Cartonero es mi Mayor Orgullo. Ministerio de Desarrollo Social, Argentina. <https://www.argentina.gob.ar/noticias/maria-castillo-el-reconocimiento-del-estado-hacia-el-sector-cartonero-es-mi-mayor-orgullo>
- 42** GAIA. (2019). Stronger Together: How the Waste Picker Movement Transformed Recycling in South Africa. <https://zerowasteworld.org/how-does-it-work/>
- 43** GAIA. (2019). Picking up the Baton - Political Will Key to Zero Waste. <https://zerowasteworld.org/wp-content/uploads/San-Fernando.pdf>



©Focalize Media/GAIA

