Building a Future for Women in South Asia's Plastics Waste Management

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South Asia's mountain economies of Afghanistan, Bhutan, and Nepal join the region's ocean economies of Bangladesh, India, Maldives, Pakistan, and Sri Lanka to curb marine plastics pollution.

This report is part of a larger series of stocktaking and analytical products on plastic pollution in South Asia. This work is undertaken as part of the World Bank's work program on South Asia Marine Plastics Pollution, which aims to promote circular plastic economy solutions, advance related country-level policy and investment dialogues, and raise awareness of the deleterious impacts of marine plastics pollution on people's lives and livelihoods. It supports the Bank's commitment to work with countries of South Asia to pursue and scale-up policies and programs that help them move toward a circular plastic economy and, in partnership with civil society and the private sector, harnesses the power of innovation to bring viable and sustainable solutions for plastic waste reduction and management across the region.

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HUMAN RIGHTS INCLUSION EMPOWERMENT

RAPID SOCIAL RESPONSE

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Acknowledgments

This report was prepared by a team led by Pawan Patil, Senior Economist, Environment, Natural Resources and Blue Economy Global Practice, South Asia Region, SSAEN [World Bank]; and Adriana Maria Eftimie, Senior Operations Officer, Sustainable Infrastructure Advisory, CEMIA [IFC] and included Taylor Cass Talbott, Sectoral Expert Consultant [World Bank]; Jorge Guillermo Barbosa, Blue Economy Specialist Extended Term Consultant [World Bank]; Sherry Goldberg, Gender and Community Development Consultant [IFC]; and Jen Scott, Senior Gender Advisor Consultant [IFC]. We are grateful for comments and guidance provided by peer-reviewers from IDA/IBRD and IFC: Silpa Kaza, Senior Urban Development Specialist, SCAUR [World Bank]; Clarisse Torrens Borges Dall Acqua, Senior Environmental Specialist, SAEE3 [World Bank]; Sibani Karki, ET Consultant, SENCR [World Bank]; Shalaka Joshi, Senior Operations Officer, CEDGB [IFC]; and Charu Suri, Senior Investment Officer, CN4S4 [IFC]. The team also acknowledges valuable contributions from Upulee Iresha Dasanayake, Senior Social Development Specialist [World Bank]; Hiska Noemi Reyes, Senior Social Development Specialist [World Bank]; Monika Kumar, Environmental Specialist [World Bank]; Nina Tsydenova, Environmental Specialist [World Bank]; Sachin Shahria, Consultant [World Bank]; Amalia Cymrot-Wu, Summer Intern [World Bank]; and Mary Edith Plunkett, Summer Intern [World Bank].

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Acronyms

ANR: National Recyclers' Association (*Asociacion Nacional de Recicladores)*

BPA: Bisphenol A

EPR: Extended Producer Responsibility

FACCyR: Argentina's National Waste Picker Federation (*Federación Argentina de Cartoneros, Carreros y Recicladores*)

FMCG: Fast-Moving Consumer Goods

GAIA: Global Alliance for Incinerator Alternatives

GBV: Gender-Based Violence

GDP: Gross Domestic Product

GEAR: Gender Equality and Returns

IFC: International Finance Corporation

ILO: International Labour Organization

KKPKP: Kagad Kach Patra Kashtakari Panchayat

LDPE: Low-Density Polyethylene

LGBTQI: Lesbian, Gay, Bisexual, Transgender, Queer and Intersex

MLP: Multilayer Plastics

MTE: Excluded Workers Movement (*Movimiento de Trabajadores Excluidos*)

NGO: Nongovernmental Organization

PET: Polyethylene Terephthalate

PPE: Personal Protective Equipment

SASAJA: Samyukta Safai Jagaran

SAP: Strategic Action Plan

SEWA: Self Employed Women's Association

SJI: Samdrup Jongkhar Initiative

SWaCH: Solid Waste Collection and Handling

TSD: Treatment, Storage, and Disposal

UNFCCC: United Nations Framework Convention on Climate Change

UNIDO: United Nations Industrial Development Organization

UTEP: Union of Workers of the Popular Economy (*La Unión de Trabajadores y Trabajadoras de la Economía Popular*)

WIEGO: Women in Informal Employment Globalizing and Organizing

Summary

Plastic waste pollution in the world's oceans and waterways has reached crisis levels, degrading the health of marine ecosystems and affecting the people and economies that they support. The South Asia Region is the third largest contributor of plastic waste globally, with 8 percent of the region's solid waste composed of plastic (Kaza et al. 2018).

Three-fourths of the South Asia Region's waste ends up in the environment through open dumping. At current rates, the amount of waste generated across South Asia is expected to increase from 265 million tons per year in 2020 to 560 million tons by 2050 (Kaza, Shrikanth, and Chaudhary 2021). Mismanaged waste has serious repercussions, especially for under-resourced communities, and solutions are urgently needed. In recent years, growing awareness about the negative impacts of plastic pollution has spurred a groundswell of investment to improve plastic scrap recovery and transform waste management systems in the South Asia Region and around the world. At the same time, the plastics waste sector presents a growing business opportunity for companies and investors[1]. While low prices of virgin plastics can undermine recycled products, there is currently a supply shortage of recycled plastics for consumer package relative to demand from sustainability-forward companies and investors and growing regulatory pressure from governments to decrease use of virgin material[2]. Investments into the plastics waste management sector thus offer both prospects for commercial upside, and opportunities to improve human and environmental health. However, they also disrupt waste management systems in ways that can displace vulnerable plastics recovery workers, including women and waste pickers, and perpetuate existing inequalities.

About 59 percent of post-consumer plastic is processed informally around the world (Pew and SYSTEMIQ 2020), with some of the world's most marginalized workers dependent on materials that now need to be drastically reduced and more systematically and formally managed. Women, especially those who work informally, are among the most precarious workers in waste management. While solutions-oriented approaches such as the circular economy are expected to improve waste management while also yielding a net increase in jobs (Willeghems and Bachus 2018), women remain vulnerable as they struggle to compete with men (Beall 2006) and tend to fare worse when faced with economic disruption (World Bank 2011, 1–19). The International Labour Organization (ILO) calls for an approach to the circular economy centered on job creation, to generate the 600 million new jobs that are needed by 2030 and improve working conditions for an estimated 780 million people working in poverty (ILO 2015a). But current trends in waste research and action linking the circular economy with social justice and worker protection remain weak (Circle Economy 2020; Kirchherr, Reike, and Hekkert 2017), and creating more decent and sustainable work for women in the informal economy must remain at the heart of debates around waste management, plastic pollution, and public health. It is important that evolving international development discourse and associated interventions do not leave women behind and better address the intersectional importance of human and environmental health, decent work, education, gender, and reduced poverty and inequality. Fortunately, the best strategies for job creation are also those that promote a healthier environment (GAIA 2021a) as well as include women. For jobs to generate and preserve opportunity for women, a gender-inclusive approach to waste management must be employed, informed by the barriers that women face in the sector as well as by their skills, assets, and contributions.

A gender-inclusive approach to waste management seeks to understand the experiences of men and women as actors in each area of the sector, map out the barriers to equality that frame their experiences, and dismantle these barriers to minimize risks and maximize opportunities equitably for all genders.

This report focuses on the role of key stakeholders (policy makers, waste management practitioners, civil society, informal workers' organizations, and the private sector) in contributing to pollution reduction in South Asia while also enhancing livelihood prospects for informal waste workers—the most vulnerable of whom tend to be women.[3] The report also demonstrates how reducing pollution and enhancing livelihood prospects are commercially sound strategies for companies and investors. Through examining the role of women in South Asia's plastic waste management systems and the challenges they face the report provides recommendations for collaborative action to improve and safeguard women's livelihoods in this sector More specifically, it examines the role of women in South Asia's plastic waste management systems and the challenges they face and provides recommendations for collaborative action to improve and safeguard women's livelihoods in this sector. Plastic pollution requires 'upstream' (waste prevention, such as reuse and repair) and 'downstream' (waste management, including recycling) solutions (Pew and SYSTEMIQ 2020). Upstream and downstream solutions fall under the broad definition of 'materials management'. The report focuses primarily on the 'downstream' aspect and key vulnerable actors, who face an imminent threat of displacement, but highlights the need to better understand and engage with vulnerable actors within upstream solutions as well.

1. The global plastic market size was valued at $ 584.7 billion in 2021 and is projected to reach $ 753.1 billion by 2026. Asia-Pacific is the largest market of plastic products, accounting for over 50% of the global demand **https://assets.kpmg.com/content/dam/kpmg/gr/pdf/2023/04/gr-the-future-of-industry-focus-on-plastics-manufacturing-042023.pdf**

2. **https://www.premiumbeautynews.com/en/the-industry-is-going-to-run-out,22000**

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The ILO's definition for decent work is used for this report. It includes workplace safety, social protection and social security, equal opportunity, productive employment with adequate earnings, rights at work, and social dialogue (ILO).

3. Across South Asia, economic opportunities are limited for gender minorities and many often do not consider formal employment as an option at all because of the fear of discrimination in the workplace. Transgender people and other individuals with nonconforming gender identity and/or expression have more limited options for employment and therefore many earn their livelihood through the informal sector or irregular work (Source: World Bank in-country consultations with lesbian, gay, bisexual, transgender, and intersex (LGBTI) civil society organizations in India and Nepal, 2020). COVID-19-related lockdown measures have disproportionately affected gender minorities and they now face the risk of long-term financial impact, with no or limited access to social protection (See: World Bank Issues Paper on the Intersection of SOGI and COVID-19).

The argument for gender-inclusive waste management is not just rights based but also economic. Improvements to waste management will be more effective and profitable if women and other marginalized low-income workers are integrated. Gender equality in waste management, particularly plastic waste management, can increase company efficiency, innovation, and competitiveness; it also has benefits for the economy, as gender disparities in labor force participation have been shown to hamper economic growth (Devadas and Kim 2020). Wealth inequality may also stymie economic growth (Cingano 2014; Dabla-Norris et al. 2015). Gender-inclusive waste management can also generate other trickle-down benefits such as improved company-community relations, more resilient supply chains, and reductions in child labor and domestic violence (Chikarmane and Narayan 2005), especially when facilitated by or in partnership with inclusive organizations such as waste picker organizations and women's associations. Building the capacity of government and the private sector to be more inclusive is also crucial. Moreover, because women tend to be tasked with waste management at the household level, waste management can be more profitable if designed with gender in mind before the disposal stage (Scheinberg et al. 1999). The waste management sector, as a provider of improved sanitation and occupational opportunity, can also serve to improve gender equality (Woroniuk and Schalkwyk 1998).

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1.

Informality and intersectional vulnerabilities in South Asia's waste systems

Waste management is predominated by workers operating in the informal economy (ILO 2013), which is characterized by an absence of workplace rights (ILO 2015b). Informal workers are those in non-elicit economic activities that are not covered under formal contractual arrangements and lack social or labor protections such as health care, work hour limits, and unemployment benefits (ILO 2015b).

Informal work is commonly also described as 'nonstandard', 'flexible', 'precarious', or 'irregular' (Agarwala 2018). The development of formal waste management enterprises in places such as India remains low due to lack of business knowledge, funding, and legal guidance as well as poor sector development (Singh 2021).

Across sectors, the South Asia Region has the highest share of informality among all regions, with more than three-fourths of workers relying on income from the informal economy and most of them lacking social protections (World Bank 2020a). Over 90 percent of India's workforce is informal, and 95 percent of India's women workers are informal (Ghosh 2021). India alone is home to more than 2 million waste pickers (Raveendran and Vanek 2020), many of whom rely on plastics recovery as a key source of income (Singh 2021). About 700 million tons of plastic is generated daily in Mumbai, nearly all of which is collected for recycling by an estimated 150,000 waste pickers (Vaidya, Kumar, and Sharma 2016).

Women outnumber men in informal waste work in many cities (Chikarmane 2012; Kaza et al. 2018), occupying the least secure and least formal end of materials management. In Delhi, for example, all women waste pickers are informal, compared with 88 percent of waste picker men (Raveendran and Vanek 2020). Women waste pickers constitute 1.8 percent of total employment in India, compared to 0.8 percent for male waste pickers (Raveendram and Vanek 2020).

Women are subject to lower compensation, less access to equipment and resources, and higher risk, while men predominate better-paid work in more formal and secure roles within waste management (Aidis and Khaled 2019; Dias and Ogando 2015; GA Circular, 2019; Samson 2020; UNEP-IETC and GRID-Arendal 2019). Different jobs tend to fall to men and women. For example, women are typically overrepresented in picking and sorting, which is lower paid work, but it is much less common to find them as itinerant buyers, dealers, or aggregators, which are more lucrative roles typically assumed by men, who dominate the informal networks.

Waste picking, like other informal work, is often a last resort source of income, with people entering due to a lack of other options (IFC 2013a; ILO 2015b). Many waste pickers have never worked another job (WIEGO 2020a). Waste picking is also attractive to refugees and other migrants who lack economic alternatives and may be willing to accept more hidden and exploitative work conditions, adding complexity to the challenge of improving the occupational status of workers in the sector.

In the South Asia Region, the informal waste sector comprises workers who often face compounding vulnerabilities and disadvantages.[4] In most South Asian countries, caste has been a major factor delineating job segregation, both historically and into the present day. This is particularly true for low-status work such as waste handling, which has historically been relegated to those of scheduled caste or tribal status. Further, the most precarious and informal forms of waste work are typically relegated to a society's most marginalized populations, including women (Aidis and Khaled 2019; Beall 2006; Dias and Ogando 2015; UNEP-IETC and GRID-Arendal 2019) and migrants. Informality is also intersectional: in India, for example, workers who are Muslim or scheduled caste are more likely to work informally (Chakraborty 2021). Gender itself is an intersectional issue, with nonbinary gender identities often unrecognized and stigmatized in many parts of the world, including South Asia.

The intersectional vulnerabilities that excluded workers often face, particularly in stigmatized occupations such as waste handling, highlight the need for approaches that can identify and protect those workers most likely to face discrimination and exclusion. Intersectional vulnerabilities also underscore the importance of public consultation and information disclosure, the need for nondiscrimination in the workplace, and the importance of comprehensive methods for targeting vulnerable populations so that they are systematically identified and integrated. A gender-inclusive approach should therefore also be inclusive of people facing other types of vulnerabilities beyond gender identity.

A gender-inclusive approach to materials management in the South Asia Region must be in line with strategies to improve conditions for informal workers, especially those who face extreme precarity. Strategies to include informal workers in better, more decent opportunities must also prioritize women, to reach the most vulnerable workers as well as their children and dependents.

4. Including, but not limited to, gender; sexual orientation; ethnicity and race; caste; class; age; ability/ disability; religion; nationality and legal working status; education level; and displacement due to environmental, political, or livelihood conditions.

2.

Plastic supply chains and the role of informal workers

The rise of plastics production in recent decades, largely attributed to the expansion of the fossil fuel industry and the increasingly inexpensive extraction of natural gas (Gardiner 2019), has dramatically transformed economies and livelihoods. As a low-cost by-product of oil-based fuel production, plastic has enabled the mass production of inexpensive goods and packaging that have made their way into even the world's most remote marketplaces. This has had important impacts on the lives and livelihoods of workers, especially informal workers, who are less resilient to disruptions in local and global supply chains.

Solid waste, particularly plastic, has given rise to an expansive global industry with a large informal sector as its base. Globally, up to 85 percent of solid waste workers are informal (ILO 2013), with many if not most of them dependent on the recovery and processing of plastics (Singh 2021). Plastic has also had, and continues to have, detrimental impacts on waste prevention workers such as artisans of products from natural materials and providers of reuse and repair services, all of whom operate within a broad definition of materials management through their prevention of plastic waste and most of whom are informal. At the same time, plastics recycling now supports a massive global labor force that is dependent on a material economy that is both unstable and rapidly changing.

Plastic scrap markets are notoriously unstable, and COVID-19 has further exposed the vulnerability of the recycling industry to supply chain disruption. Several months into the COVID-19 pandemic, informal waste collectors across five Asian countries (India, the Philippines, Vietnam, Thailand, and Indonesia) reported a 65 percent reduction in plastic volumes collected, while recyclers reported an average 50 percent drop in demand for their recycled plastic, with 40–60 percent of recyclers and value chain businesses at risk of closure (GA Circular 2020).

Even alternative plastics processing, such as co-processing in cement kilns, is highly vulnerable to supply chain disruption. Construction slowdowns during COVID-19, for example, reduced the demand for plastic feedstock in cement kilns, hurting the market for multilayer packaging (GA Circular 2020).

In South Asian countries, the increasing trend toward nonrecyclable and low-value plastics is exacerbating market instability as well as environmental pollution and social inequality. In India and Southeast Asia, for example, nonrecyclable sample-size sachets now account for 95 percent (by volume) of food and nonfood industry sales (Tearfund 2019). The increase in low- or no-value materials, matched with growing urbanization, consumerism, and waste generation (Kaza et al. 2018), is exacerbating environmental pollution as governments struggle to provide collection services at pace with waste generation. As with most forms of pollution, low-income communities are disproportionately affected, with waste recovery workers such as waste pickers often paradoxically lacking access to adequate waste collection at home. About 130 million people live in South Asia's urban informal settlements (World Bank 2016).

The expansion of different plastic types, especially multilayer packaging and other single-use plastics, has made sorting and recycling more challenging and more expensive. Many waste picker groups such as India's SWaCH[5] Cooperative advocate for the elimination of single-use multilayer plastics (MLP) because they are difficult and environmentally problematic to manage and, even when covered under extended producer responsibility (EPR), do not generate significant income for waste pickers in comparison with other materials or potential product delivery options. Replacing such materials with alternate product delivery systems that facilitate reuse could potentially generate more and safer livelihoods, as could ensuring that a larger share of the materials entering the market are high value (Anantakrishnan 2021). The economic challenge of sorting low-value material is particularly problematic in places where the cost of labor for sorting and processing exceeds the market value of the sale of materials for recycling, as in wealthier countries. This has led to the development of an extensive but opaque global recycling trade in which wealthier countries ship their materials, especially dirty or poorly sorted materials, for processing in countries with low-cost (and largely informal) labor and weak enactment or enforcement of labor and environmental regulations.

Countries in the South and Southeast Asia regions are among the major recipients of plastic scrap imports, particularly since the enactment of **China's National Sword** policy which continues to restrict plastic imports to China over environmental concerns. Plastic scrap imports flood local waste markets with materials, lowering scrap prices, overburdening local recycling systems, and undermining incentives for the local collection and sorting of recyclables (Interpol 2020) as well as income for waste pickers not involved in plastics import trades. It is for this reason that some organized waste picker groups, such as Argentina's National Waste Picker Federation (*Federación Argentina de Cartoneros, Carreros y Recicladores,* FACCyR), campaign against plastics imports. As of January 1, 2021, transboundary movement of some plastic scrap now requires consent and approval between countries that are signatories of the **Basel Convention.**

5. SWaCH = Solid Waste Collection and Handling.

It is still unclear how this will play out in practice, especially between countries such as the United States that are not party to the convention, given the lack of traceability and rise in criminality within global plastics supply chains (Interpol 2020). Regardless, the change is expected to generate disruption in the industry globally. All South Asian countries are party to the Basel Convention.

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leakage of plastics into the environment which, if implemented poorly, can present a risk to waste picker livelihoods. Often, the measures to mitigate plastics pollution result in restrictions on public access to recyclable material, including through the privatization of waste collection, the containerization (or locking) of public waste bins, and the closure of open dumps. Many governments around the world have also implemented public cleanliness policies and campaigns that prohibit the usage of public space for waste pickers and other informal economy workers such as street vendors. While efforts to mitigate plastics pollution are essential for the protection of human and environmental health, such approaches should be accomplished through, or combined with, efforts that safeguard the livelihoods of impacted workers.

As is characteristic of other global supply chains (Tewari 2020), there has been little success in enforcing or even mandating labor protections at the base of plastic scrap value chains. Waste management, namely plastics waste management, is increasingly known as an industry that profits from the exploitation of low-cost labor under dismal working conditions. Most waste pickers are not organized (Cardoso 2021), and even those who are organized struggle to access labor and social protections. Workers at the base of recycling value chains tend to lack agency to influence the terms and conditions of their work, while material value and access is highly variable. The proliferation of disposable plastics in supply chains has thus globalized a dynamic in which waste management is sustained by the environmental and economic exploitation of some of the most informal and precarious workers within the global economy.

Growing awareness and understanding of the environmental impacts of plastic pollution has provoked investment in efforts to prevent the

With rising waste generation rates and growing challenges in managing waste adequately, policies such as mandated source segregation of waste, single-use plastics bans, and EPR may help close gaps in waste collection and provide opportunities for women and waste pickers. But unless policies are designed to also facilitate the economic inclusion of waste pickers and their organizations, they risk causing more damage than good for informal and women waste workers. EPR may, for example, attract competition and sector privatization, as many Indian waste pickers are experiencing under voluntary EPR schemes in the lead-up to the country's impending packaging EPR policy. EPR initiatives in countries such as Brazil, Egypt, and Chile are making attempts to integrate waste workers in the informal economy, but more work is needed to assess and track the successes and weaknesses of these systems. EPR is one of many elements that is ushering in the privatization of waste management in many places, as it tends to have a consolidating impact on the waste industry (Cass Talbott et al. 2022).

Threats to waste picker livelihoods

Exclusionary Policies and Public Space Campaings: Campaigns and policies to promote cleanliness and beautification are often used to expel informal workers from public and private spaces, and to criminalize informal waste picking.

Privatization: Using private businesses to collect or process waste and recyclables can compete with waste pickers for access to materials.

Locked Bins: Efforts to lock public and private waste and recycling bins prevent waste pickers from safely accessing materials.

Waste imports: Flooding recycling markets with large amounts of foreign recyclables reduces the price of materials in the importing country, reducing waste picker earnings. Waste imports are often contaminated with non-recyclables, resulting in the burning and dumping of residuals. This pollutes poor communities where waste pickers live.

Incineration & Chemical Recycling: Incineration and chemical recycling companies divert materials away from the mechanical recycling industry, undermining waste picker livelihoods. The also tend to be located in poor communities where waste pickers live, polluting the air and soil.

Technology: Waste management technology is increasingly replacing human labour in waste management actors to be more efficient or atractive, thereby outcompeting waste pickers.

Landfill Closure Without Inclusion: Landfill closures often displace large numbers of waste pickers from their work. Waste pickers can organize and advocate to be integrated into formal waste management systems outside of the landfill, such as door-to-door waste collection, recyclables sorting and processing, litter collection and public cleaning, and collection of civil construction waste.

Source: Women in Informal Employment: Globalizing and Organizing (WIEGO). For more information about WIEGO's Reducing Waste in Coastal Cities project, please visit **www.wiego.org/rwcc**

Demonstrating waste picker engagement in the crafting of EPR

EPR is increasingly framed as an important tool for reducing plastic pollution and sourcing funding to improve waste management, but waste pickers around the world, the most vulnerable of whom are women, are uncertain whether EPR is an opportunity or a risk. If designed for inclusion, EPR can generate low-barrier environmental jobs (Rutkowski 2020). In general, though, EPR is more likely to disadvantage waste pickers (OECD 2016) and, by and large, continues to be designed in ways that sideline informal waste economy workers (Cass Talbott et al. 2022). In 2018, the Global Alliance of Waste Pickers, with support from WIEGO, began working with waste picker organizations around the world to identify the impacts of EPR systems on waste pickers and develop an official position on EPR from the perspective of waste picker organizations across the five continents represented by the alliance (Asia, Africa, Latin America, Europe, and North America) (Global Alliance of Waste Pickers 2021). The process comprised regular exchanges between waste picker organizations about their experiences with EPR, the (ongoing) development of case studies documenting opportunities and challenges in integrating waste pickers into EPR, and the creation of a workers' education training that was delivered to more than 250 waste pickers during more than 20 workshops to both orient waste pickers on EPR and inform the crafting of an official position paper on how EPR can be designed to be more inclusive. In its review of EPR policies attempting inclusion of waste pickers, the Global Alliance of Waste Pickers has found that 'inclusive' EPR policies are still largely aspirational and countries such as Brazil and Chile that are attempting inclusive packaging EPR are still handing over considerable opportunity to the private sector rather than waste pickers and their cooperatives. Governments around the world have struggled or outright neglected to engage waste pickers and their organizations in the crafting of EPR policies (Cass Talbott et al. 2022), but the Global Alliance of Waste Pickers, through its work on EPR, aims to demonstrate what it takes to engage vulnerable workers in policy design. Its work is a useful guide for a Just Transition toward a more circular economy.

Source: https://epr.globalrec.org.

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Historically, many private sector players have actively lobbied against waste reduction policies such as plastic bans and EPR (Corkery 2019) and have attempted to solve the problem of waste in the environment by investing in cleanup initiatives and voluntary plastics recovery projects. Companies have tended to invest in initiatives that mobilize volunteers in litter collection, which have not matched the need, may undermine investment in paid job opportunities in litter collection, and often lack transparency about the quantity of materials collected (Brock, Geddie, and Sharma 2021). These initiatives are also sometimes used as an excuse to resist mandatory producer responsibility policies (Cass Talbott 2021; Corkery 2019). The private sector also invests in material recycling efforts, usually of higher-value plastics. While improving single material recycling markets is important, expanding general waste collection to all residents, including those in informal settlements (the burdens of which fall disproportionately on women), is urgent and critical to human and environmental health. The private sector can strengthen its accountability to the prevention of litter by supporting policies that enable government to facilitate fully remunerated litter and doorstep waste collection and by financing cleanup efforts that fairly remunerate all workers and address all waste in the environment.

Plastics, oil, and chemical companies are investing heavily in the expansion of plastics production, which is predicted to be the largest growth market for oil in the next decade, and in 'chemical recycling' technologies such as pyrolysis to convert low-value plastics into fuel (James 2019). While producers prefer targeting higher-value plastics such as polyethylene terephthalate (PET) bottles, for which scrap markets and informal collection supply chains already exist in most places, they are also under pressure in some places to establish markets for materials that lack value in recycling. Pyrolysis facilities, for example, are increasing rapidly throughout the South and Southeast Asia regions, often serving as an excuse for companies to avoid investment in recyclable and reusable packaging. In India, producers are implementing voluntary EPR systems (that precede the implementation of existing mandatory EPR policy) that are establishing markets for the recovery of multilayer packaging through coprocessing in cement kilns and other incineration and plastic-to-road projects. These new markets have attracted both opportunity and competition for informal workers, though it is overall understood that waste-to-energy reduces jobs in the sector (IJgosse 2019; GAIA 2021a). One objective of these technologies is to eliminate the need for costly sorting and cleaning of materials, jobs that are important income sources for workers across South Asia and the world.

The environmental and health impacts of these solutions are also problematic and understudied and need more attention (Shah 2020), and there is evidence that chemical recycling emits more greenhouse gases than landfilling or coprocessing in cement kilns (Sustainable Solutions Corporation 2020). Furthermore, the functional and financial challenges to the viability of these technologies are resulting in the continued landfilling and low-tech incineration of materials, such as coprocessing in cement kilns, without transparency about the end destination of these materials in many cases (James 2019).

Companies are increasingly subjecting their plastics supply chains to traceability programs to help ensure and show consumers that they are preventing negative social and environmental impact. Traceability documents each step of the supply chain, from the sourcing of the raw materials through to the final product, illuminating the people and places along a product's journey. Traceability can be proven through a combination of digital traceability, mass balances, invoices, and even physical tracers. The private sector is investing in digital technology to improve traceability within the waste system, which can highlight gaps in plastics management and enable waste workers to better collect and track data. As pressure grows to include waste pickers in formal waste management, some companies are developing digital technologies that are accessible to people with limited literacy and technological capacity. Despite the potentially exclusionary effects of technology, it remains an unavoidable driver of today's economies and can provide opportunity for the inclusion of women and other marginalized groups if they are able to use it effectively. Digital technology can in some cases, for example, lower barriers to establishing small businesses (World Bank 2020a) and even to engaging in informal waste recovery using social media and digital marketplaces. Digital technology can facilitate better material and financial traceability, which can better motivate investment in waste picker organizations, and support planning for more equitable distribution of market share opportunity in the sector. It is critical that women in particular receive digital literacy training and those efforts to design and adopt technology in the sector do not lead to the proclusion of nonorganized workers nor those who cannot adapt to technology.

Tech-based solutions such as Uber for Recycling digital applications and plastic credits, modeled after carbon credits, are also making their way into South Asia's waste systems, promising to alter the economics of existing plastics management systems. Tech-based solutions often fail to benefit more vulnerable groups such as women and waste pickers, ultimately competing with them for materials. Plastic credit schemes need more work to improve transparency, engage affected stakeholders, and work toward constant improvement (Circulate Initiative 2021). Digital application-based platforms also need to improve transparency so that their social impact can be better understood, particularly in relation to gender participation and the labor conditions (income, employment status, and access to social and labor protections) of workers. That said, the registration and traceability services that these solutions provide can help generate evidence of work that can be used by governments and the private sector to provide social and labor protections for informal workers—as is beginning to happen in India and other places.

Growing concern for marine waste pollution is increasing the number of companies that are incorporating recycled plastics into their products, particularly in the fashion and apparel industry. Similar to the fashion industry's significant (though perhaps not enduring) efforts to improve labor conditions at the base of their supply chains in the years following Bangladesh's Rana Plaza disaster (Paton 2020), many apparel brands are exploring ways to improve labor and environmental conditions within their supply chains. This may hold promise for women in the South Asia Region, which is already a world hub for textiles and apparel manufacturing, as the apparel industry is labor intensive and generates jobs that allow for skill building (Lopez-Acavedo and Robertson 2016). There is also already a growing artisan community using plastics for textiles and accessories, though it is unclear how sustainable these livelihoods are as the lower costs and greater scale of industrial production continue to outcompete artisanal work, in the absence of any policies to protect or promote the latter. While recycled plastics may generate increased opportunities in the apparel industry,[6] it is important to recognize that synthetic textiles are a significant source of microplastic on land and in waterways (De Falco et al. 2018) and securing and sustaining adequate labor standards requires ongoing tending and monitoring.


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As companies increasingly attempt to reduce their plastic footprint, many are signing on to plastics recycling targets, which can help balance market volatility, establish stronger markets for recycled plastic, and hopefully also increase social accountability. There are now innumerable plastic reduction-related pacts and multistakeholder processes that engage or are led by the private sector with the goal of strengthening recycling. Some initiatives are working to inform more ethical investment in ocean-bound plastics supply chains through working groups, research, and investment in supply chain infrastructure and systems to establish more environmentally or socially ethical plastics supply chains. Efforts are increasing to develop frameworks for more equitable engagements between the private sector and the informal waste economy. Increasingly, companies and their social responsibility networks are also emphasizing the important role of gender inclusion in waste management. Global initiatives such as the UN Treaty on Plastic Pollution as well as the private sector's active engagement as part of the UN Global Compact's Sustainable Ocean Business Action Platform aim to strengthen environmental safeguards in plastic supply chains. These important efforts must be substantiated with social safeguards. To avoid activities that undermine opportunities for waste pickers, companies should invest in the co-production of projects with waste pickers or invest directly in waste picker-led work and improve data collection and transparency to advance learnings in best practices.

Some private sector companies have their social standards reflected in a code of ethics or conduct that governs health, safety, and other working conditions in their supply chains. They then verify and enforce these standards with their suppliers through third-party audits, due diligence, and certifications. In recycled plastics and many other raw materials sectors, though, these audits and certifications typically only reach the formal factory level at which materials are recycled or commercially concentrated, which can leave out the most vulnerable frontline people in the supply chain (Corkery 2019). Ultimately, a legally binding treaty will likely be necessary to make significant gains in environmental outcomes within plastics supply chains, but the participation of women, waste pickers, and other informal waste workers will be essential to ensuring that standards are also inclusive.

6. While these jobs tend to be dominated by women, they also tend to be low-paid and low-quality jobs. Programs such as the ILO and International Finance Corporation (IFC) Gender Equality and Returns (GEAR) and Better Work Bangladesh are attempting to overcome these restraints by training women to take on supervisory roles (Better-Work 2019).

3.

Fostering inclusive waste management: The role of formalization

Supporting the working poor in the informal economy is increasingly recognized as a key strategy for reducing poverty and inequality (Chen 2012), with formalization often cited as the ultimate goal. As the ILO states in its **Recommendation 204**, the transition of workers from the informal to the formal economy is key to inclusive development and decent work for all (ILO 2015b). When done well, formalization can be especially beneficial for women (Ghosh 2021).

Depending on the focus or interpretation of formalization, however, formalization can negatively affect informal workers (Ghosh 2021) and women are often left behind as the waste sector formalizes (Dias and Fernandez 2013; Dias and Ogando 2015; Rudin, Van den Berg, and Abarca 2014; Samson 2003; Scheinberg et al. 2016; UNEP-IETC and GRID-Arendal 2019). Within the waste sector, formalization can typically connote the standardization of practices, the formation of organizations and businesses, taxation and registration, legal recognition, the issuing of contracts with social and labor protections, and the provision of infrastructure (WIEGO 2021). Waste pickers and other marginalized informal workers often face the negative forms and externalities of formalization, including costly registration requirements; landfill closure and other forms of restricted access to materials and public space; and taxation without linked benefits such as the provision of contracts, access to infrastructure and investment, and social and labor protections. This is especially true for women, who are more likely to struggle to meet the demands of formalization (Figure 1). They may, for example, be more likely to need registration and taxation support from intermediaries, which increases their expenses and further puts them at a disadvantage (Ghosh 2021).

Figure 1: Potentially beneficial and detrimental forms of formalization for informal waste workers

Detrimental forms of formalization

1. Taxation without benefits
2. Costly or administratively challenging registration requirements
3. Landfil closure without integration
4. Restrictions on public access to waste
5. Privatization of waste management
6. Infrastructure and equipment requirements for contract eligibility without adequate support
7. Restrictions on access to public space without alternative space provisions

Beneficial forms of formalization

1. Provision of safe infrastructure and equipment
2. Social and labor protections
3. Formal and legal access to public space
4. Worker registration with attached benefits/ incentives
5. ID card issuance
6. Contracts for services
7. Legal recognition of informal waste work
8. Support for organizing
9. Inclusive planning processes
10. Investment and access to credit

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Informality remains a persistent and growing feature of modern economies and waste management systems despite the global development push toward formalization (Agarwala 2020; Chen and Carré 2020; Harriss-White 2020; ILO-WIEGO 2013; O'Neill 2019; World Bank 2020a). The primary achievement of twentieth century labor movements, which largely excluded women and informal workers, was in securing formally regulated work and protections for [some] workers. But to cut costs, states and employers have responded by sidestepping such regulations through informal employment (Agarwala 2018). Governments and the private sector tend to talk about the importance of enterprise formalization while at the same time promoting labor deregulation (Madhav and von Broembsen 2021). This generates a 'false formalization', in which formal companies use informal labor to reduce costs (Ghosh 2021).

In South Asia and across the world, sanitation jobs that were once formal are now being re-informalized, through the 'contractualization' and 'gigification' of labor. For example, Indian railways, public hospitals, and municipalities are contractualizing their sanitation workers—demoting workers to independent contract laborers—undermining their income and labor protections (Harriss-White 2020). Gig labor, usually described as digital platform-based jobs accessed through smart phone applications, is also growing steadily in the waste sector. The rise of the gig economy and contractualization are often part of the proliferation of informal jobs within formal enterprises.

While contract labor and other informal work are often described as 'nonstandard' or 'alternative', they are quickly becoming the norm. Unprotected[7] informal employment in nonagricultural work, for example, now drives employment growth in India (Agarwala 2020). Between 1985 and 2011, informal workers in formal registered factories grew from 12 percent to 51 percent in India (NSS 2012). Poverty figures show that increased productivity and formal work are correlated with declining wages and working conditions overall, suggesting that formalization is happening at the expense of other workers (Agarwala 2018).

To benefit informal workers, formalization should establish accessible pathways and beneficial incentives for informal workers to move into more decent and formal work if desired but should not destroy informal opportunity within the economy (Chen 2012). It is important to recognize that formalization does not work for everyone (Chen 2012) and the eradication of informal opportunity does not necessarily lead to formalization but can rather lead to unemployment (Scheinberg et al. 2016). This emphasizes the need for formalization processes to be designed specifically to improve employment conditions for workers.

7. Lacking labor or social protections.

Formalization can benefit workers, especially women, when it is driven by their social and labor protection. Formalization often targets enterprises (through registration and taxation) rather than employment conditions, especially if the motivation is to increase the tax base (Ghosh 2021). This can increase the cost of operation for small and medium enterprises and self-employed workers, without producing benefits such as social and labor protections. Labor and universal social protections are needed to support workers, especially women (Ghosh 2021) and those whose occupational status is in flux. Increased labor and social protections must also be matched with capacity development to increase productivity and a rise in demand for the product or services, or else they can lead to reductions in employment as a cost-cutting measure (Ghosh 2021).

'Waste picker organizations', which can take shape as cooperatives, membership-based organizations, nonprofits, mutual aid networks, foundations, trusts, unions, and social enterprises, help implement waste picker integration, often also called 'inclusive waste management', around the world in collaboration with government and sometimes also the private sector. Waste picker integration constitutes formally planned materials management systems that recognize and improve the role of waste pickers in waste recovery systems by building on their strengths and including them as key stakeholders in design, implementation, evaluation, and revision (DEFF and DSI 2020). Integration can be more transformational when it is framed as an integration of municipalities and industry into the existing systems of informal recyclers rather than the other way around (Samson 2021a). Integration can encompass forms of formalization that are beneficial to informal workers, by generating social and labor protections, contracts for workers, formal inclusive planning processes, access to infrastructure and investment, and support for organizing, without displacing vulnerable workers in the process. These systems emphasize economic distribution (and redistribution) through sufficient low-barrier opportunities to build on the skill set and needs of informal workers and resist trends toward automation through the promotion of labor-intensive systems.

Within an inclusive waste management system, informal workers are more able to find low-barrier pathways to formal, fairly remunerated, stable work to advance in value chains within the system (UNESCAP 2021).

Challenges to the integration of women into formal waste management

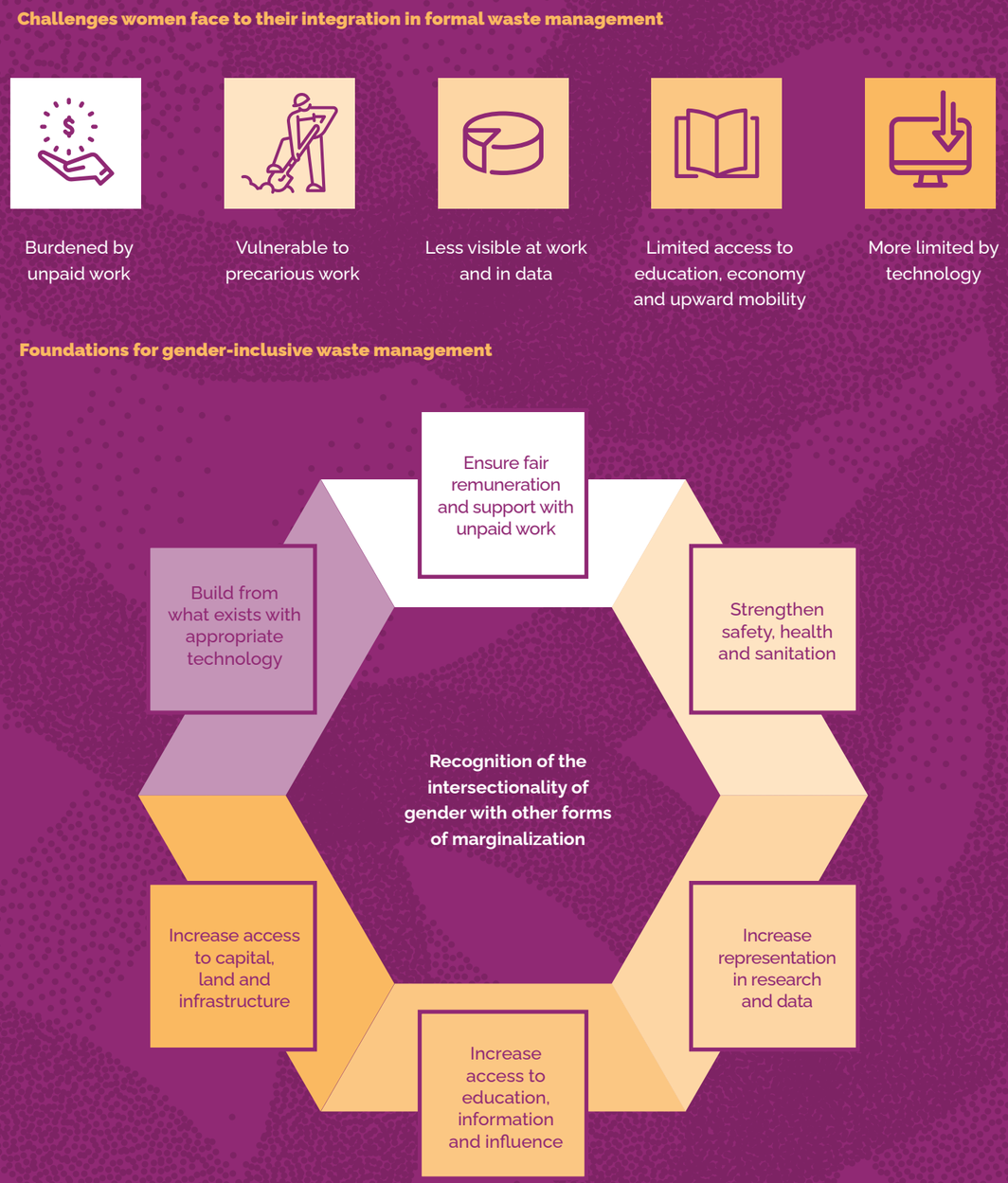
Women play a key role in all aspects of waste generation and management, from shopping and the selection of products to household and community cleaning work to waste picking and employment in waste management. All these roles present challenges to women's advancement as workers within waste management systems, factors that need to be understood to lower barriers to their participation at all levels of the materials management industry (Figure 2). While private companies or municipalities that preside over plastic waste management systems and facilities can greatly benefit from understanding the complexity of the sector-related issues impacting women and vulnerable populations – they do not necessarily need to possess deep expertise to engage constructively on gender. As the case studies covered in this report attest to, there are plenty of innovative partnership models, advisory support, and intermediary organizations available to help facilitate this process.

Women are burdened by unpaid work

Women predominate in unpaid home and community care responsibilities, including shopping, childcare, cleaning, and waste management, which can inhibit their involvement in education and paid work (Aidis and Khaled 2019; Dias and Fernandez 2013; Dias and Ogando 2015; ILO 2018; UNEP-IETC and GRID-Arendal 2019). The World Bank estimates that decreasing a woman's unpaid care work by an average of two hours per week can correlate to a 10 percent increase in her workforce participation (Ferrant, Pesando, and Nowacka 2014). Women's labor force participation in South Asia is 23.5 percent and 20.5 percent in India and steadily declining (compared with 77 percent and 76 percent, respectively, for men) (ILO 2020b; World Bank 2020c). Even before COVID-19, which affected women disproportionately, women in Pakistan were 12 percentage points more likely than men to be unemployed and 8 percentage points more likely to be looking for work (Taş et al. 2021). Women in Asia and the Pacific perform four times more unpaid care and home care work than men (ILO 2018) and almost ten times more in India (MGI 2015). Women in Pakistan spend 11 hours for every 1 hour that men spend on household and caregiving work (Taş et al. 2021). In this region, men perform the lowest share of unpaid care work of any region (ILO 2018), and low-income women spend significantly more time performing unpaid care work than higher-income women (Lawson et al. 2020). In Peshawar, where women's labor force participation is just 13.4 percent, only 7.6 percent of women are free to decide to work outside the home, and it is estimated that their labor force participation could increase by 7 percent just by gaining more access to employment information (Redaelli and Rahman 2021). COVID-19 has increased women's unpaid care work around the world (Ghosh 2021; ILO 2020a; World Bank 2020).

Women are often enlisted as volunteers, or underpaid workers, to conduct waste sensitization outreach (usually to other women) or perform waste management (Fredericks 2018; Scheinberg, Muller, and Tasheva 1999), deepening their undervalued role in the sector. In India, where informal women workers earn less than half the wage rate of informal male workers (Chakraborty 2021), women occupy some public sector positions that have been informalized to such an extent that workers are labeled as 'volunteers' receiving 'stipends', to sidestep minimum wage laws (Ghosh 2021).

Figure 2: Challenges to the integration of women in formal waste management in relation to the foundations for gender-inclusive waste management



In Pakistan, increases in female labor force participation between 1992 and 2015 (before it began to decline) were largely in unpaid agricultural work (Taş et al. 2021). In some places, women are contesting their underpaid role in the waste sector.

Argentina's Environmental Promoters (***Promotoras Ambientales***) program provides one such example. The environmental promoters, supported by **FACCyR** as well as Argentina's **Excluded Workers Movement (*Movimiento de Trabajadores Excluidos*, MTE)** and **Union of Workers of the Popular Economy (*La Unión de Trabajadores y Trabajadoras de la Economía Popular*, UTEP)**, are women waste pickers who were able to secure the first gender-oriented public policy in their country's waste sector, which provides women with a government contract to provide paid doorstep waste sensitization. Similarly, FACCyR's female environmental guardians have municipal contracts in some coastal areas of Argentina to collect litter on beaches and sensitize the local population to properly dispose of waste.[8]

Because women predominate in household cleaning, waste management, and shopping duties, they are often exclusively targeted in waste reduction sensitization, entrenching their role as unpaid household waste managers, cleaners, and shoppers and discouraging male participation. Targeting women may result in faster short-term improvements in waste management, but it further anchors their informal role in the sector (Harriss-White 2020). This form of gender bias risks feminizing recycling and waste prevention such that men feel averse to engaging with the issue (Swim, Gillis, and Kaitlynn 2020), which can hinder waste prevention goals and place added burden on women.

Women's home care duties can lead to child labor if women lack sufficient resources for safe childcare options, which can expose children, especially girls, to dangerous conditions and disadvantage from an early age. The need to bring their kids to work may also disqualify women for inclusion in more formal work opportunities, which is yet another reality that is exacerbated by economic strain as seen in the rise in child labor as a result of the COVID-19 pandemic (World Bank 2020d).

Women are more vulnerable to precarious work

Women in communities without proper waste collection face disproportionate risks in trying to manage waste on their own. Universal waste collection remains challenging, especially since many of the proposed solutions to plastic waste pollution do not incentivize the collection of some of the most hazardous types of plastic. Women tending burning piles of household waste is a ubiquitous sight across the South Asia Region, with burning plastics linked to serious health concerns (Cook and Velis 2020). Women also put themselves at risk of gender-based violence (GBV) when trying to find hidden or distant places to dispose of waste (GA Circular 2019). Specific occupational health risks are also present for women (particularly pregnant women) who are working with plastic waste and/or living in local communities where plastic waste often ends up before collection. Bisphenol A (BPA), a component in many hard plastics, is a known hormone disruptor; studies have linked it to increases in diabetes, heart disease, birth defects, early puberty, and elevated levels of certain liver enzymes. Plastics marked as BPA-free still often contain any number of hormone-disrupting chemicals (Stann 2020). Women who have everyday contact with BPA from plastics have an increased risk of miscarriage, polycystic ovarian syndrome (which is known to cause infertility), baldness, and breast cancer (Cariati et al. 2019).

8. WIEGO. "Reducing Waste in Coastal Cities through Inclusive Recycling." Accessed July 30, 2021 **https://www.wiego.org/rwcc.**

BOX 1: Eliminating child labor in the plastic sector

There are approximately 16.7 million child laborers across South Asia (excluding Afghanistan) by conservative estimates, although estimates vary for children working in the waste sector. Handling and collecting waste can be hazardous work that creates serious health and safety risks, particularly at open and unsanitary dumpsites. Informal waste workers are exposed to medical waste including syringes, human waste, toxic smoke from open burning at waste sites, and chemicals. Children who work in the waste sector experience serious health impacts at a far greater rate than other children; this includes anemia; gastrointestinal diseases; respiratory issues; and injuries including from sharp objects (Chintan 2018), lifting heavy objects, and falling at dumpsites or off waste trucks.

Within the waste sector, the primary drivers of child labor are household poverty and lack of access to education in informal waste collection communities. A survey of informal waste workers in Delhi found that 25 percent of children in waste collection families work and the vast majority (90 percent) work in waste-related livelihoods and do not go to school (80 percent) (Chintan 2018). Although the issue of child labor is complex, since simply banning or ending child labor can force a family further into poverty in the short term and does not solve the issue of access to education (particularly when there are school fees or costs), governments must contribute solutions and viable education pathways for families to ensure they are not relying on their children to work for basic household income.

Entities that buy from waste collectors need to pay fair rates for materials. Entities that employ waste collectors need to pay living wages so that collectors' children are not required to work for additional income and should formalize employment such that collectors have access to health and social benefits, childcare and schooling options for kids, and labor protections such as collective bargaining and the right to association (Moussié 2016). Governments should ensure labor regulations such as minimum wages, sick pay, and parental leave, as well as social protection such as health care and universal childcare, to support such efforts. Companies that utilize recycled plastics in their end products should also trace their supply chains and build in sufficient wages for the people collecting plastics.

Affordable quality childcare options for young children not yet in school or even after-school programs for older children that parents are comfortable with are essential to allow mothers to work without bringing their children to work. Specifically, childcare needs to be available at hours that allow women in the plastics sector to work, which can include early mornings. The private sector, government, nongovernmental organizations (NGOs), and waste picker organizations can all contribute to ensuring that quality childcare is available either for free or at an affordable cost for women working in the plastics and waste sectors. Studies have also shown that providing access to childcare for employees yields business gains.[9]

9. **Tackling Childcare: The Business Case for Employer-Supported Childcare (ifc.org)**

Policies to phase out harmful chemicals used in packaging plastics, such as brominated flame retardants (BFRs), BPA, phthalates, and lead, and policies that ban harmful plastics such as vinyl and polystyrene (Shah 2020) should be urgently adopted. The environmental injustice of inadequate waste management options in low-income communities underscores the need for plastic pollution prevention efforts to prioritize interventions that result in more complete collection of household waste.

Women are more likely than men to seek out independent, flexible, and informal work due to home and childcare responsibilities (MGI 2018) or to avoid potentially dangerous circumstances such as domestic or sexual violence (Samson 2020). This affects their working schedules, location, and methods in ways that can inhibit their ability to compete with men for access to materials and more stable work opportunities, worsening the already precarious nature of informal waste work. In Dakar, Senegal, recent changes to collect and dispose of household waste at night instead of during the day undermine the livelihoods of women waste pickers on the city's Mbeubeuss dumpsite because picking at night is more dangerous and conflicts with childcare duties (WIEGO 2021). Domestic violence can inhibit women's ability to work freely, which is often exacerbated by economic strain, as witnessed in the rise in child and gender-based violence during the COVID-19 pandemic (World Bank 2020d). COVID-19 has exposed particular vulnerabilities for people in countries that have not invested sufficiently in the care sector, especially for women (ILO 2020a).

The COVID-19 pandemic has highlighted the disproportionate vulnerability of informal workers to disruptions in supply chains (World Bank 2020a), including those in recycling trades (Krishnan and Backer 2019) and especially women (ILO 2020a). Women's jobs have been more negatively affected by COVID-19 and are less likely to rebound since the pandemic (ILO 2020a; Taş et al. 2021), with the full impact yet to emerge. Women now struggle even more than before to retain an equal footing in the economy, with their COVID-19 experience shaped by a rise in domestic and workplace violence, greater care responsibilities, work insecurity, and a disproportionate lack of access to working capital and digital tools such as mobile phones (ILO 2020c). Women are also disproportionately vulnerable to other types of crises such as the extreme events and ecological threats that are associated with climate change (World Bank 2011), indicating that women's empowerment and economic stability are central to community resilience.

Women are more vulnerable to inadequate occupational health and safety conditions, such as poor access to bathrooms or washing facilities, which can expose them disproportionately to risk of violence and illness. Informal and precarious work exposes women disproportionately to mental and physical illness and violence, including heightened risk of sexual violence while working (Dias and Ogando 2015; Madsen 2005), further preventing their ability to maintain stable work. Discussion about occupational health and safety tends to focus on protective equipment, a focus that has received still more emphasis during the COVID-19 pandemic. But secure, ergonomic, and well-ventilated infrastructure, with safe access to bathrooms and clean water for washing (DEFF and DSI 2020), is equally important and deserves more attention and funding.

Women are vulnerable to exploitation and abuse in waste value chains. The structure of the informal plastics waste management sector relies heavily on middlemen who buy materials from waste pickers and sell them onto the market. Women rarely advance in supply chains to the level of 'middlemen' and face a constant risk of exploitation and a thick glass ceiling in the industry.

Women face invisibility in public, at work, and in data

Women tend to engage in more hidden forms of waste work than men, often to avoid dangerous situations or social stigma. Women waste workers present a particular challenge to researchers in the South Asia Region, where women are more likely than men to be working out of public view. For example, in countries such as Nepal, women waste pickers tend to work in more hidden circumstances, in informal sorting facilities or processing materials at home or in dumpsites, where they are often overlooked by data collection efforts.

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often lacks data and evidence of their impact due to a dearth of suitable indicators and the lack of funding for measuring impact (Circle Economy 2020). Fortunately, a growing number of researchers are interested in documenting the informal waste economy around the world, and initiatives such as the **Global Alliance of Waste Pickers** and the **Environmental Justice Atlas** help track key issues facing waste pickers around the world.

Lack of mechanisms for gender-disaggregated data collection and the lack of recognition for informal waste work as an employment category within country-level statistics bureaus hinder research on waste pickers, especially women, with advocacy needed to close these data collection gaps (Grambangla Unnayan Committee, Child-Hope UK, and Big Lottery Fund 2017a) and train governments to collect and use such data.

Hidden gender relations can obscure important information for waste management planning. In some places, for example, men control finances but may not value (women-dominated) waste work and are therefore less willing to pay for it. For the same reason, women may have to pay for it from their own income (Scheinberg, Muller, and Tasheva 1999).

Lack of research and attention on waste and women inhibits their inclusion in development plans. Though waste is a highly gendered issue, meaning that women are active but marginalized within the sector, globally there is little information about the link between gender and waste (Beall 1997; Dias and Ogando 2015; Samson 2020; Scheinberg, Muller, and Tasheva 1999; UNEP-IETC and GRID-Arendal 2019), especially plastic waste and regarding the informal waste sector. Plastic waste management studies do not usually address gender, and the sustained integration of women into solid waste management globally has been negligible (Aidis and Khaled 2019). Furthermore, social and solidarity economy work, like that of many women's and waste picker organizations,

Women often lack access to education, economic opportunity, and upward mobility

Lack of education and exposure to training opportunities inhibits women's advancement and ability to compete in the waste sector. About 66.5 percent of women waste pickers in India (and 100 percent in Delhi) have less than a primary level of education, with only 4.8 percent having a secondary level or higher education (Raveendran and Vanek 2020).

Women are also disproportionately unaware of their labor rights and social entitlements, which can lead more easily to exploitation (Ghosh 2021).

Dumpsite closures and other disruptions to public access to waste are among the key junctures where women are edged out of the sector or pushed into more precarious work. Privatization of waste management, which can exacerbate the negative impacts of informality (Samson 2015; Scheinberg et al. 2016) and negatively affect waste services and gender equity (Samson 2003), can play a core role in restricting waste picker access to waste (Weghmann 2020). Indian organizations such as Chintan have reported a 50 percent loss of waste picker livelihoods as a result of waste sector privatization, which also threatens established waste picker organizations such as the SWaCH cooperative (Singh 2021). The privatization of landfills, in particular, is known to disrupt waste picker livelihoods (Scheinberg et al. 2016, Dias 2018) and contribute to the consolidation of the waste sector. Privatization can also undermine material diversion for recycling and can exacerbate pollution in low-income communities (Sandhu, Burton, and Dedekorkut-Howes 2016). Source segregation of waste initiatives that are designed without waste picker inclusion, and 'containerization' efforts that usher in the locking of public trash cans and recyclable materials receptables, can also have significant negative impacts on the livelihoods of informal waste pickers, especially women. For informal waste pickers, access to waste constitutes the right to work and is increasingly acknowledged within a human rights framework.

Women around the world hold just three-fourths of the legal rights that men have, with all South Asia Region countries ranking among the lowest in the world for gender equality in law (World Bank 2021). Women are disadvantaged under the law in areas related to mobility, marriage, pay, ownership of assets, social benefits such as pensions, parenthood, entrepreneurship, and workplace rights. Greater gender equality under the law is linked with higher labor force participation rates and fewer female workers in precarious work. Having women in positions of power to influence the law is important to improvements in women's economic opportunity (World Bank 2021).

Women are less likely to be represented in, and therefore supported by, people in higher decision-making roles (Samson 2003). Men are more likely than women to have financial support from family or credit institutions (Scheinberg, Muller, and Tasheva 1999). Advancing women in organizational leadership helps center women's issues, better enabling women's labor force participation over the long term. Capacity development and leadership opportunities within Argentina's waste picker movements, for example, helped female waste picker María Castillo to recently (Aguilera 2021) be selected to head the National Directorate of the Popular Economy (part of the Ministry of Social Development). Women in positions of power may also be more inclined than men to support progressive environmental policies, as seen in cases of plastic bag bans in places such as Rwanda and Ladakh having been initiated by women.

Throughout the plastics waste management value chain in emerging markets, women are less represented in opportunity niches that correlate to higher financial potential. This is true of the division of labor within the informal workforce and plastic waste entrepreneurs who formalize into companies.

Businesses such as aggregators, material processing company owners, landfill operators, and dealerships/brokerships are still overwhelmingly male owned—as are technology and platform-based start-ups that aim to bring more transparency to the plastics value chain and simplify logistics for companies to purchase from the informal waste sector.

Women are more limited by the introduction of technology

Technology-intensive systems reduce low-barrier opportunities for waste pickers and contribute to job shortages (Chen 2012), often in parallel with economic shifts reducing formal employment (Scheinberg et al. 2016). Women are more likely to be limited by lack of literacy, training, or technical skills and may not adapt as well to technological change (Aidis and Khaled 2019). Waste systems based on automation and capital-intensive technologies such as incineration generate significantly fewer jobs than recycling or reuse, especially in comparison with waste picker-based systems (GAIA 2021a; IJgosse 2019), increasing competition for jobs in a sector that already disfavors women. The prohibition of manual transportation equipment such as human- and animal-powered carts also advantages workers and businesses with more resources. The World Bank, in its 'What a Waste 2.0' report, acknowledges that high-tech solutions are often not the best option in waste management (Kaza et al. 2018).

Technology can undermine the power of workers to organize by reducing a company's dependence on workers or dispersing them geographically, which can deteriorate the quality of jobs (Heintz 2020; Rani 2020). On the other hand, lack of access to technology that can potentially benefit workers can similarly hold informal workers back. Lack of equitable access to technology has made participatory engagement and training of waste workers more difficult during COVID-19, for example (WIEGO 2020b).

Digital technology is growing unabated in South Asia and the world and is playing an increasingly disruptive role in waste management, especially for women. This includes digital tools to improve traceability and data collection and gig platforms such as 'Uber for Recycling' businesses in which workers can be independently contracted in the doorstep collection of recyclables. India, Bangladesh, and Pakistan are home to some of the largest concentrations of gig platform workers in the world (Rong and Djankov 2018). India has the highest number of gig workers, with 24 percent of the world's online labor (Atal 2020). Anecdotally, gig platform applications can provide opportunities for waste pickers but tend to privilege men and more resourced waste pickers, itinerant buyers, and intermediaries in the system—especially those with their own transportation and smart phone. Women earn 8–10 percent less than men in gig work and face many of the same gender barriers as with traditional work (Atal 2020). Women in South Asia are also 19 percent less likely than men to own a mobile phone and 36 percent less likely to use mobile internet, down from 28 percent and 58 percent, respectively, in 2018 (GSMA 2021).

Digital platforms are also introducing new actors into the sector—usually as formal companies that contract informal gig workers—increasing competition for waste pickers while still not generating more formal work. COVID-19 has furthermore highlighted the importance of e-commerce in the region, which is more challenging for women and informal workers to access (World Bank 2020a). But if women and other more marginalized actors in the waste sector can be trained to use them, these technologies could be used to improve social and labor protections in the sector. India's Code on Social Security of 2020, for example, includes gig platform workers, requiring them to register with the government and making them eligible for certain social and labor protections. Because gig platform work is documented through a digital application, it can be relatively straightforward for the government to include this type of work within social protection schemes. Digital platforms that facilitate access to social protections and welfare programs are increasingly common in countries such as India.

Safeguarding the livelihoods of women informal workers

Safeguarding livelihoods in the waste sector means safeguarding labor rights and human rights amid high levels of informality and an absence of sufficient worker protections. Waste management is of critical importance to poor communities and marginalized populations—both as a source of livelihoods and often as the sole source of sanitation and health. This complicates efforts to improve waste management and underscores the important role of organized and coordinated efforts, to allow workers to represent themselves and their communities and to influence the terms and conditions of their work over time while backed by just policies and investments at all levels.

Safeguarding livelihoods means navigating monumental disruption to the industry as the global community pushes for improved plastics management and more ethical supply chains. Transition and economic adjustment often coincide with the expansion of informal employment, not of formal employment (Chen 2012), so these transitions must be navigated carefully. Concepts such as '**Just Transition'** and 'Livelihoods **Safeguarding**', which propose protection or retraining for livelihoods affected by disruption, remain understudied and enigmatic in the waste sector. The ILO's recommendations for Just Transition to a green economy include "adequate and sustainable social protection for job losses and displacement, skills development and social dialogue, including the effective exercise of the right to organize and bargain collectively" (ILO 2017).To prevent disruptions in waste management from displacing the livelihoods of informal workers, inclusion of vulnerable workers, such as women waste pickers, must be prioritized. Supporting the most vulnerable actors in waste sector supply chains, through inclusion and informal worker-directed formalization/integration processes, strengthens waste management overall by accounting for the most hidden and overlooked human, material, and labor aspects of waste systems.

Safeguards are increasingly mandated as conditions of financing from investors. IFC's Environmental and Social Performance Standards, the World Bank's Environmental and Social Framework, and the Equator Principles, for example, serve as risk management frameworks for investments.

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BOX 2: Safeguarding waste picker livelihoods in the face of bans on single-use plastics

The Ministry of Environment of India announced amendments to the 2016 Plastic Waste Management Rules stipulating the elimination of single-use plastics in three phases, starting in 2021 through 2022 (Sambyal 2019). If executed strategically, plastic bans and taxes can not only effectively reduce plastic waste usage but also increase demand for zero waste event services and segregation rates, leading India closer to a sustainable and circular economic system (Willis et al. 2018). In the context of India's relatively limited waste management capacity and high rates of plastic use, approximately 1.5 million informal workers are essential stakeholders in the picking, sorting, and reuse of plastic. Waste pickers are highly dependent on plastic, with over 40 percent of their income derived from plastic collection (Ghanekar 2021). Waste management systems are similarly reliant on waste pickers; the informal sector accounts for the majority of the labor behind India's plastics recycling (UNDP 2021).

The environmental research group Chintan, along with its partners in India such as Hazard Center, Hasiru Dala, and the Kagad Kach Patra Kashtakari Panchayat (KKPKP) waste picker trade union, developed and are advocating for a proposal to 'Plan the Ban' to ensure that the needs of waste pickers are incorporated into the upcoming legislation and the livelihoods of waste picker are safeguarded. Based on extensive surveys, plastic audits, and group discussions with waste pickers in Delhi, Pune, Indore, and Nainital, Chintan produced recommendations to create a fairer and more inclusive ban on single-use plastics in India. First, they advocate the reorganization of the stages of the ban such that low-value, nonrecyclable items such as MLP and plastics containing harmful chemicals are phased out first. In contrast, PET and packaging materials made of low-density polyethylene (LDPE), which make up 50–60 percent and 20 percent (respectively) of plastic sold by waste pickers, should be phased out last. The proposal also calls for the inclusion of institutional commitments to the formal training and retraining of waste pickers in the legislation to compensate for lost income.

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Most waste workers are essentially specialists in their field, so the most common alternative livelihoods among waste pickers—including wet waste management, housekeeping services, and restoration and resale services—should be targeted for capacity building and support as well. Many waste pickers also already provide reuse and repair services, which, with the provision of space for such work, may also provide opportunities for those displaced by the ban to create income through the restoration and reselling of otherwise discarded products (Chintan 2021). Chintan, along with other waste picker advocacy groups, recommends expanding and enforcing EPR programs to deal with low-value plastic. Replacing low-value materials with high-value ones can strengthen the informal waste sector's capacity to handle materials such as MLP and generate livelihood opportunities in the context of a plastic ban (Anantakrishnan 2021). As India turns plastic free, it is crucial to include waste pickers as key stakeholders in the planning and promotion of sustainable waste management and the fight against plastic waste pollution.

Investors also require and often guide companies toward improved environmental, labor, community, and gender practices. Companies that demonstrate a commitment to safeguarding women informal workers are likely to attract more financing opportunities because of investors' interest in being associated with lower-risk, ethical, and innovative practices. Beyond safeguard frameworks, investors are now actively promoting best practices, providing technical guidance, and instituting targets, such as gender diversity targets. Safeguards are also emerging at the governmental and intergovernmental levels. For example, in March 2021, the European Parliament, in recognition of the limitations of voluntary due diligence, proposed legislation to mandate human rights and environmental due diligence in the supply chains of companies established or operating in the European Union.

A hybrid system that enables the informal economy to thrive alongside the formal economy (Chen 2012), with positive rather than punitive incentives to formalize workers, particularly women, is needed. This demands labor-intensive growth (Chen 2012) with more effective distribution of income and opportunity, flexible planning that is built on existing practical experience of the informal sector (Ezeah, Fazakerley, and Roberts 2013; Samson 2020), and ongoing local consultation and action with key stakeholders (Aidis and Khaled 2019; Circle Economy 2020; Dias 2011a; Samson 2020; SWMRT 2019). Waste pickers need support to organize, be provided with contracts for service provision as essential service providers, and be provided with social and labor protections regardless of their formal status. NGOs, unions, and social movements are critically important to positive formalization—especially in mobilizing and advocating social and labor projections (Ghosh 2021). Likewise, the private sector and governments play an essential role in paving the way toward safeguarding livelihoods and mitigating the global threat of marine plastic pollution.

4.

Defining the roles of stakeholders

Inclusive waste management systems are impossible to achieve without the buy-in and collaboration of multiple stakeholders, especially waste picker organizations and other civil society groups, governments, and the private sector (Figure 3). Increasingly, all these sectors are involved in waste management, with particular as well as overlapping roles to play. The boundary between civil society, the public and private sectors, and waste picker organizations may not always be well defined. Around the world, waste pickers are being contracted and sometimes also organized by governments, private companies, civil society organizations, and their own organizations, cooperatives, private businesses, and unions. This section investigates the role that key stakeholders play in strengthening the resources and organizational development of women waste pickers, to better ensure their long-term integration into formal systems.[10]

10. Researchers and their institutions play an important cross-cutting role in advancing understanding of inclusive waste management, identifying best practices, and building evidence for waste picker and women's inclusion; this group is included within each of the stakeholder categories presented here.

Figure 3: Summarized role of stakeholders in inclusive materials management[a]

Note: PRO = ; SWM = Solid waste management.

a. See the recommendations chapter for more details.

Role of waste picker organizations and civil society in promoting gender-inclusive waste management

Waste picker organizations such as cooperatives, membership-based organizations, nonprofits, mutual aid networks, foundations, trusts, unions, and social enterprises are mobilizing excluded workers around the world, often with a strong focus on gender inclusion and with support from community organizations and public and private sectors. Waste picker organizations are commonly conceived as part of the social solidarity economy, a concept that is of growing interest for institutions such as the ILO as a way of conceptualizing economic and social considerations together within the economy.

Civil society organizations around the world have enabled the development and strengthening of waste picker organizations through incubation, funding, capacity development, and support in destigmatization campaigns. For example, the NGO Practical Action helped establish the now independent waste picker organization Samyukta Safai Jagaran (SASAJA) in Nepal. Similarly, WIEGO, through its project **Reducing Waste in Coastal Cities through Inclusive Recycling,** is supporting the capacity of waste picker organizations to integrate into formal waste management in ways that maximize marine waste prevention. The important role of membership-based organizations and social movements to ensure that formalization efforts are rooted in the needs and demands of informal workers, especially women, cannot be underemphasized (Cardoso 2021; Dias 2016; Ghosh 2021). More research is needed to explore and document their impact and ways of organizing as well as to better understand why certain organizations have maintained strong female participation and leadership.

Those organizations that pursue transformational change in the waste system to establish structural and long-term modalities for integration, through approaches that are worker driven, are particularly effective at supporting women and other vulnerable workers over the long term. Integration approaches that are short term or small in scope or neglect to include the most vulnerable are not transformational. National, regional, and global networks of activists and informal waste workers help build solidarity to collectively conceptualize and push for transformational change in the waste sector's evolving landscape. Global organizations such as **WIEGO** and the Global Alliance of Waste pickers help strengthen the capacity of waste pickers and their organizations to negotiate for their own integration into formal waste management. In South Asia, the **Alliance of Indian Waste Pickers** supports capacity building and networking at a national level, with growing links to other waste picker organizations in the region.

Waste picker and other informal workers' organizations have been more effective at mobilizing and supporting women than traditional twentieth century labor movements (Agarwala 2018). Women working in these organizations are more likely to have access to leadership opportunities, equipment and protective gear (Lobo et al. 2016),

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better and safer working conditions, access to benefits such as insurance and credit, childcare, equitable pay, and freedom from harassment (Dias and Fernandez 2013; Dias and Ogando 2015), and the ability to support girl children with upwardly mobilizing benefits (Chikarmane and Narayan 2005). In 2008, a group of women waste pickers in Bangladesh began organizing with support from a local organization Grambangla Unnayan Committee and in 2015 established Bangladesh's Waste Picker Union of more than 500 members, who continue to be led by women.[11]

Waste picker organizations support workers to advocate for their rights to better working conditions, which often also translates to standing up for their rights at home. Organizations help workers counter occupational hazards such as police aggression, through registration, issuance of ID cards, destigmatization efforts, negotiation for contracts and infrastructure, and advocacy for social and labor protections. They also help protect them from exploitation from lenders and buyers. India's Self-Employed Women's Association (SEWA) and KKPKP waste picker union have helped protect women waste pickers from exploitative intermediaries by providing them with their own facilities for the storage, sale, and even purchase of materials (Scheinberg, Muller, and Tasheva 1999). Many waste picker organizations also facilitate self-help savings groups or provide no- or low-interest loan options. Nepal's SASAJA waste picker cooperative, for example, was formed to facilitate savings and cooperation among women waste pickers, helping more than 800 waste pickers receive loans, form savings groups, and receive training on credit and saving. More research is needed to understand the localized barriers to women's advancement and how organizations respond to them.

Waste picker organizations can help establish and improve upon employment-generating, low-barrier, and technologically appropriate waste management models that are built on existing informal systems. Waste picker involvement in waste management increases job generation (GAIA 2021a) and the models that waste pickers develop to improve waste management in cities tend to have a lighter carbon footprint (Chikarmane 2012; King and Gutberlet 2013; WIEGO and Global Alliance of Waste Pickers 2019) and be more affordable (GAIA 2021b) than private waste management. They also tend to be more accommodating of workers with greater barriers to formal employment, including women. Waste picker organizations and other community-led waste collection initiatives in Asia and throughout the world have successfully maintained the participation of women and others in need of low-barrier work by combining decentralized push-cart-based collection with truck-based collection, for example. These organizations need to be strategically consulted to understand how the introduction of technology might affect the role of women in the waste sector and what can be done to keep work low-barrier.

11. https://globalrec.org/organization/bangladesh-waste-pickers-union-formerly-named-as-association-of-waste-pickers-of-bangladesh/

BOX 3: SWaCH's decentralized waste collection system run by women waste pickers

Kagad Kach Patra Kashtakari Panchayat (KKPKP) was established in 1993, bringing together Pune's waste pickers and itinerant waste buyers from the informal waste collection system, with current membership of 8,000 waste picker members. Led by some of the poorest dalit women of Pune, KKPKP successfully argued that the work of materials recovery and handling by waste pickers is environmentally sustainable, is economically productive, and saves municipalities millions of rupees in solid waste management.

KKPKP's systematic engagement with the Pune Municipal Corporation over two decades culminated in the joint creation of the SWaCH Pune Seva Cooperative Society in 2007, India's flagship waste picker owned cooperative, structured as a pro-poor public-private partnership with the municipal system. It has enabled waste pickers to demand and occupy a seat at the table in determining and playing a key role in implementing the city's waste management policies. This has generated sustainable livelihoods for 3,650 waste pickers of SWaCH, who collect sorted waste from over 900,000 households in the city every day. The decentralized nonmotorized doorstep waste collection model facilitates waste recycling of 80,000 metric tons, saving the city more than US$15 million annually.

The waste pickers of SWaCH have since pushed boundaries beyond doorstep collection of waste. Several waste pickers now provide value-added services such as in situ management of organic waste (compost, biodigesters). In 2019, the cooperative partnered with one of India's largest fast-moving consumer goods (FMCG) conglomerates, ITC Limited, in an 'extended producer responsibility'-based partnership to reclaim and recycle MLP. About 1,000 waste pickers have engaged actively in this initiative, retrieving over 1,000 metric tons of MLP, increasing their average monthly income by INR 600. Similar initiatives are in place for other difficult-to-manage wastes such as sanitary waste (feminine hygiene products and diapers) and Thermocole/Styrofoam creating an entire new post-consumer waste management stream from collection to recycling in partnership with manufacturers of such materials. The cooperative also runs a thrift store promoting upcycling and reuse, reaching over 75,000 citizens annually, channeling over 300 metric tons of materials toward reuse. SWaCH Plus pushes the frontiers; its women leaders challenge the city, waste producers, and the government to accept them in their newer avatars as drivers, managers, scrap traders, recyclers, re-processors, and more.

SWaCH worker Mangalbai Gaikwad uses her pushcart to promote SWaCH's Red Dot Campaign to improve the way households dispose of sanitary waste.

Photo credit: Brodie Cass Talbott.

Waste picker organizations play an essential role in training women, especially in participatory ways that do not require literacy skills. Common training needs include leadership and organization building, collective bargaining (Agarwala 2020), communications, democratic processes (Muller and Scheinberg 2003; Masood and Barlow 2013), gender, health and safety, political organizing (Dias and Ogando 2015), waste management, policy and legal compliance (GTZ 2011), research, environmental identity, and plastic waste and marine waste prevention livelihoods opportunities.

Organizations also work to build the capacity of workers in the use technology. NGOs, governments, researchers, and the private sector also need capacity building to help the informal waste sector self-organize (GTZ 2011; Ocean Conservancy 2019), and experienced waste picker organizations can often provide this type of training.

Waste picker organizations help reduce child labor and respond to domestic violence. The KKPKP waste picker union, in Pune, India, for example, began organizing women waste pickers as a strategy to eliminate child labor, by fighting for women's access to improved income and working conditions (Chikarmane and Narayan 2005). Similarly, the Bangladesh Waste Picker Union has been heavily supported by the civil society organization Grambangla Unnayan Committee, which provides childcare and child education opportunities. Waste picker organizations, especially those led by women, are important to the transition away from child labor in the sector by improving income, establishing shared agreements about issues such as child labor, and sometimes also providing scholarships for children to attend school. Many organizations, such as Bangladesh's Gram Bangla Unnayan Committee, India's SEWA, and cooperatives within FACCyR, have on-site day-care facilities for workers. Organizations such as India's Hasiru Dala and Stree Mukti Sanghatana provide family and domestic violence counseling services for their members. Organizations such as Nepal's SASAJA waste picker cooperative provide training, school kits, uniforms, and health care for the children of waste pickers.

Waste picker organizations are important for informing and implementing social and economic policies that support inclusion (Circle Economy 2020). Waste picker organizations in countries such as India are key to advocating for and enrolling workers in social protection schemes (Agarwala 2020; Ghosh 2021).

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During the COVID-19 pandemic, informal workers organizations provided critical relief and protection for informal workers around the world, including in South Asia, by facilitating the access to government support and providing emergency food relief (Alfers, Ismail, and Valdivia 2020; WIEGO 2020b).

Waste picker organizations usually aim to support the most vulnerable, often including advocacy for independent workers who are not affiliated with organizations. For example, FACCyR is fighting the locking of public trash cans, largely for the benefit of independent workers who are not affiliated with the federation (Grimaldi 2019), since federated workers can access materials at the household level through government contracts. At the outset of the COVID-19 pandemic, Colombia's National Recyclers' Association (*Asociacion Nacional de Recicladores*, ANR) enabled elderly and other highly vulnerable workers to remain at home (Parra 2020). In many places, waste picker cooperatives buy scrap from unaffiliated workers, ensuring fair prices.

Waste picker organizations are key to improving the perception of informal waste pickers, through destigmatization efforts that build their identity, as essential environmental workers promoting health and sanitation. Contrary to conventional waste haulers, waste picker organizations often promote waste prevention, though their livelihoods depend on material recovery. Promoting the identity of waste pickers as environmental workers has been an important strategy for validating waste picker integration. In the South Asia Region, in particular, many of the more visible waste picker organizations have worked in close collaboration with zero waste movements, promoted by local and international environmental groups which have built relationships with waste pickers by advocating for inclusive, labor-intensive, locally appropriate, and decentralized waste management systems as key to waste prevention. Organizations such as WIEGO, **Global Alliance for Incinerator Alternatives (GAIA),** and **Break Free from Plastic** work closely with waste picker organizations around the world to advocate for inclusive waste management as essential to environmental waste management. Waste picker participation in environmentalism is also motivated by environmental justice issues because they generally live in low-income communities and are disproportionately affected by mismanaged waste, including polluting technology such as incineration.

Role of the private sector in inclusive waste management

The private sector is increasingly recognizing its opportunity to improve performance and profit—as well as social impact—by responsibly integrating gender inclusion into corporate ethos and practice, across the plastics waste management workforce, supply chains, partnerships, and relationships with communities and customers. The notion of responsible gender inclusion in this context requires that the imperative for a commercial upside be combined with respect for the rights of key stakeholders of all genders—particularly those working in the informal sector. It is important to note that private sector leadership must implement operational transformation at the corporate and policy levels. While many companies along the plastics value chain partner with local community organizations, sponsor innovative initiatives, and publicly express their support for gender equality and waste pickers, some of these same companies have been found to simultaneously lobby against efforts for increased waste picker and environmental protections. Not only does this make companies less competitive against their increasingly socially responsible rivals, but it also poses great reputational risk, during an age in which consumers are more discerning, grassroots efforts are coordinated across countries and regions, and social media connects us all.

Private sector companies work at various points along the plastics value chain, in production, manufacturing, collecting, sorting, recycling, and disposal. This section addresses these companies as a whole as well as the occasional investor (see Annex 1 for additional case studies and entry points for the private sector).

Increasing gender inclusion when engaging with the informal waste sector generates performance gains for companies by harnessing the skills and expertise that female waste pickers have already acquired. Collecting and sorting requires familiarity with different types of plastics and their value and fine motor skills. Contracting or subcontracting with women who have had to develop the ability to sort quickly and efficiently helps companies ensure high-quality feedstock (Krishnan and Backer 2019). Investing in training, personal protective equipment (PPE), safe equipment, and fair wages and labor and social protections for all workers encourages retention and helps support smooth company operations. Engaging with established organizations, associations, cooperatives, or start-ups to broker the integration of informal waste workers can create more opportunities for local value creation and reduce the logistical burden of managing supply chain complexity while retaining the benefits. Women working as part of organizations and associations also tend to benefit from more secure and better-waged employment—which can help companies create a more socially responsible supply chain.

In some places, private sector actors help identify and fill gaps in waste management by investing in experimentation in inclusive waste management through the piloting of waste picker integration proposals (Masood and Barlow 2013; Samson 2020) for women-led projects, which helps workers envision and test out new or different ways of working. Private sector-funded pilot projects for inclusive waste management systems can be found in countries such as India, Nepal, Brazil, South Africa, and the United States.

In the United States and South Africa, producer consortia contract waste picker organizations for the provision of services and materials from the beverage industry. In Brazil, the private sector has long sponsored waste picker cooperatives, including through the country's reverse logistics EPR system. In India, companies sponsor special projects and voluntary EPR implemented by waste picker groups. Voluntary EPR efforts, led by private companies ('producers'), are yielding more stable plastic scrap markets in some places, even generating markets for materials that previously lacked them, and are generating income and increased legitimacy for waste pickers and their organizations when they are integrated. In South Africa, voluntary EPR efforts working with waste pickers have created local end use markets for materials and provided resilience to China's ban on scrap imports (DEFF and DSI 2020). These types of programs should increasingly aim to help close waste collection gaps in low-income communities. These initiatives should also be designed in collaboration with both waste pickers and government, to improve transparency, keep entry barriers low, and ensure fair remuneration and protection of workers. Because private sector-led voluntary initiatives tend to be small in scope and lacking in transparency, they should move toward mandatory (policy-driven) models that can be upscaled (in both materials managed and number of workers integrated) and effectively enforced and monitored by government and society at large.

Companies can benefit from engaging with consumers before plastic is even disposed of, by harnessing gender insights to better target consumers and increase recycling rates. Manufacturers, recycling companies, and retailers of plastic products (particularly those that operate in jurisdictions where stricter standards have been introduced on materials management and elimination of single use plastics) benefit from proper processing of waste at the household level. Waste collection costs typically account for 60–70 percent of a waste management budget (Kaza et al. 2018); sorting waste more properly before arrival will increase the efficiency and cost-effectiveness of waste management. In some countries, studies have shown that women are more inclined to recycle, more interested in learning what becomes of waste after it is thrown away, and more socialized toward sustainability and proper disposal practices (Krishnan and Backer 2019). Women also influence 70–80 percent of all consumer purchasing decisions globally (Brennan 2015). However, carrying out these responsibilities can often exacerbate the gendered burden of unpaid work. Therefore, awareness campaigns and product marketing campaigns should strategically target all genders, to facilitate behavior change in household waste management as well as educate people on how product life cycles can improve the effectiveness of plastics waste management at the source (Scheinberg, Muller, and Tasheva 1999).

By making supply chains more gender inclusive, companies can not only leverage their influence to improve conditions for women and informal workers, but they also stand to improve performance, reduce potential for disruptions and conflict, and lower reputational risks from gender-specific vulnerabilities in the supply chain.

BOX 4: Partnering with the private sector to improve labor conditions in Nepal's plastic supply chains

In 2019, Nepali community-based organization Creasion, with support from the private sector, initiated the Recycler Saathi program to improve Nepal's PET plastic recycling supply chains while also improving the welfare of waste workers, especially women. The partnership enables Creasion to operate its own PET sorting and baling facility, generating decent livelihoods for women and men in the informal economy. Workers are provided with health and accident insurance, minimum wage standards, psychosocial checkups and support, regular health checkups, occupational health and safety training, and labor standards in compliance with local labor laws. Creasion purchases bailed PET from other stakeholders in the industry, giving them a deeper understanding of the challenges that women face in the sector and building trust and influence in the system to better advocate improvements in labor standards. Creasion provides networking and labor and occupational safety training to other supply chain stakeholders to raise the overall labor standards of the industry. The initiative also educates the broader population, through school outreach initiatives, and other events such as their annual International Women's Day event celebrating the contributions of women in waste. In 2021, Creasion mapped waste picker organizations in Nepal, the results from which have enabled them to introduce Nepali waste picker organizations to the regional and global networking processes of the Global Alliance of Waste Pickers.

The private sector can help scale investments in entrepreneurship and start-ups by focusing on gender inclusion in plastics waste management as well as identifying and nurturing female-led enterprises. Plastics waste management is a global challenge and requires significant innovation with the development of more comprehensive systems, human ingenuity, and a range of business models to help tackle the problem. Many women-led businesses in emerging markets—particularly those in male-dominated sectors such as waste management—struggle to access capital, networks, and publicity at the same rates as their male counterparts. Global data from entrepreneurship surveys show that women are more likely than men to found businesses with social and environmental goals or to aim for a 'triple bottom line' (Hechavarria et al. 2012). Given the urgency of the plastics waste management crisis, identifying early-stage female-owned businesses to support with networking, capacity building, and financing can offer investors new opportunities to expand their portfolio of high-performing companies. Gender Lens Investing, "a strategy or approach to investing that takes into consideration gender-based factors across the investment process to advance gender equality and better inform investment decisions,"[12] has undergone immense growth in the last decade. Some examples of recent gender lens investments and financial instruments in the plastics sector include Circulate Capital Ocean Fund's 2020 loan to women-owned and managed recycling entity Tridi Oasis Group; Althelia Sustainable Ocean Fund's 2020 investment of US$2 million in Plastics for Change, which works with informal waste collectors; and the listing of Women's Livelihood Bonds in the SGX in Singapore in both 2017 and 2020.[13]

Around the world, companies are increasingly providing equipment, training support, and infrastructure to support capacity building and financing for waste picker groups. Such initiatives began as a form of corporate social responsibility but are now becoming mainstreamed into voluntary or mandatory EPR schemes—helping to give structure and add value to private sector compliance standards. Private investors, particularly those with a social impact lens, are also beginning to finance organized waste picker-led initiatives—recognizing their potential to develop into full-fledged, profitable formal ventures. For example, Social Alpha, a social impact incubator (Bateman and Bonanni 2019), helped Indian waste picker organization Hasiru Dala establish a private company and scale its work, after it had struggled to gain traction as a nonprofit. Similarly, in Brazil, private companies have seen the business opportunities in becoming investors and partners in the country's national cooperative movement. Investments can also make commercial sense to waste management companies further along the supply chain, particularly if the company in question is striving for best practice social performance—for example, through investing in fair trade scrap shops which aggregate and bundle plastics at larger volumes while employing local people (Anantakrishnan 2021). In addition to boosting social performance, investment by companies or private capital outfits into the informal waste sector supply chain can also help create continuity, resilience, and stability in the waste system in the face of market disruptions or shifts in political power (Circle Economy 2020).

By making supply chains more gender inclusive, companies can not only leverage their influence to improve conditions for women and informal workers, but they also stand to improve performance, reduce potential for disruptions and conflict, and lower reputational risks from gender-specific vulnerabilities in the supply chain. While the private sector's approach to supply chain due diligence has traditionally been one of risk management, in recent years it has learned of the competitiveness and marketability that positive social impact can bring and that it is in its best interest to get ahead of the curve and pursue a triple bottom line. Despite the adoption of codes of conduct, certifications, independent audits and involvement with multistakeholder initiatives that include civil society organizations, improvements to labor conditions have been limited (Madhav and von Broembsen 2021). However, simply shifting supply chains risks further disadvantaging existing workers. Companies should commit not only to traceability but also to transparency and direct engagement with informal workers, making them more likely to improve rather than abandon problematic supply chains.

Understanding their plastic supply chain in detail down to the sourcing level, and the challenges faced by women sourcing their plastics, enables companies to begin to develop a relationship with the women and communities in which they are working, to eliminate any conditions of exploitation of women, children, and workers and find solutions. To gain the trust and cooperation of the communities in which they operate and prevent supply disruptions or conflict plastics waste management companies can benefit from finding ways to incorporate both male and female waste pickers and collectives from the informal system into their supply chains. But this must be done in ways that improve work rather than simply exploiting informal labor.

Data across industries and countries prove that when workforces are gender diverse at all levels, company performance improves. Companies and municipalities stand to benefit from closing gender gaps between existing employees through investing in training, policies, and other measures as well as through targeted efforts to recruit more women—especially in areas where they are currently underrepresented. Prioritizing diversity leads to a wider talent pool, increased variety of ideas, and more innovation and productivity.

12. https://thegiin.org/gender-lens-investing-initiative
13. https://oceanconservancy.org/wp-content/uploads/2021/04/Ocean-Conservancy-White-Paper-Full_20210426.pdf

Striving for gender equality in company workforces and in those of their suppliers increases equality of opportunity, strengthens the talent pool, and improves company performance and resilience. Data across industries and countries prove that when workforces are gender diverse at all levels, company performance improves (Turban, Wu, and Zhang 2019). Companies and municipalities stand to benefit from closing gender gaps between existing employees through investing in training, policies, and other measures as well as through targeted efforts to recruit more women—especially in areas where they are currently underrepresented. Prioritizing diversity leads to a wider talent pool, increased variety of ideas, and more innovation and productivity. Company experience and extensive research also find that gender diversity in the workforce leads to improved accident rates and health and safety, as female employees have a greater tendency to comply with safety protocols and care for equipment (IFC 2013b). This does not mean that either female or male employees are more ideal than the other, but, rather, that they bring different skills and attributes to the table. In India, Indonesia, the Philippines, and Vietnam, for example, women in the plastics waste management sector are preferred for skilled and time-intensive tasks, such as picking and sorting, that require fine motor skills (Sumangali and Backer 2021). Spending the time and money up front to prevent sexual harassment and GBV in the workforce also reduces business costs—sexual harassment is estimated to cost a typical Fortune 500 company US$14 million per year (Parramore 2018). Gender equality in the workforce not only benefits companies, it also boosts prosperity for families, communities, and countries. A McKinsey study estimated that advancements in women's equality through improvements in their labor force participation, numbers of hours of paid work, and participation in productive sectors could add US$4.5 trillion to the collective annual gross domestic product (GDP) of Asia Pacific countries in 2025 (a 12 percent increase over the predicted trajectory). The study also found that India presents the largest relative opportunity at US$770 billion (an 18 percent increase) (Woetzel et al. 2018).

Companies can also incentivize their suppliers to hire frontline collectors as formal employees and require that they be granted freedom of association, collective bargaining powers, and basic social protections. Beyond the basics of fair pay and working hours, health and safety training, adequate PPE, health care, and other insurance coverage, companies can implement holistic programs to educate staff about finance, assist staff in opening bank accounts, set up childcare options, and facilitate school access. Workers should also be engaged to participate in the design of systems and grievance mechanisms. Moreover, these actions can enhance a company's reputation with customers and stakeholders while strengthening its social license to operate with the local community (especially waste pickers)—thus minimizing the likelihood of operational disruption. Given that reuse and repair are more environmentally sound and generate more jobs than recycling or disposal, companies can also develop systems to repair and reuse their products that can employ front line workers.

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Role of government and policy in inclusive waste management

Government has an important role to play in setting and enforcing policies to protect women and waste workers. The combination of public policies mandating source segregation and single-use plastic regulation has incentivized formal opportunities for women waste pickers, especially when planned together with them. These policies have helped create and improve markets for the provision of services such as zero waste event management, composting, waste collection and processing, and reusable goods provision (see Annex 2 for a more comprehensive overview of the relevant policies in the region). India's Solid Waste Management Rules of 2016 mandates that waste be collected from the household level in a segregated manner—wet waste, dry waste, and hazardous waste. Because the policy also directs local government to include waste pickers in the implementation of waste management, the policy's source segregation mandate obliges the government to support waste pickers in the collection of segregated waste. All South Asian countries have implemented some degree of regulation on single-use plastics, with mixed results in terms of compliance and enforcement to date. In cases where source segregation has been implemented without the participation or integration of existing informal waste pickers, policies or initiatives mandating source segregation can undermine waste picker access to materials and ultimately displace informal livelihoods (Samson 2020). Government plays a central role in determining the approach with these types of policies.

Policy efforts such as the introduction of EPR policies, if oriented for integration, could incentivize the inclusion of informal workers and women in formal waste management and can generate low-barrier environmental jobs (Rutkowski 2020). EPR has tended to focus on economic (Stephenson and Faucher 2018) and environmental aspects of materials management but not on social aspects (Woggsborg and Schroder 2018), and few good examples of EPR attempting inclusion exist around the world. When the informal waste sector is not taken into account in the design of EPR modalities, it can hinder the achievement of its objectives (Gupt and Sahay 2015; OECD 2016; Scheinberg et al. 2016) and undermine waste picker livelihoods. As the waste and recycling industries have grown more consolidated around the world, EPR systems may enable greater financial efficiency and profit but without clear rules for effective and equitable cooperation within the sector (OECD 2016). If implemented, EPR should be used as a mechanism for funding government to facilitate the fairly remunerated collection and processing of household waste, recyclables, and litter so that all communities have adequate sanitation. Government can advance inclusive EPR by engaging waste picker organizations in the design of EPR and by mandating integration plans in EPR. Inclusion in EPR can also benefit from financial and material transparency, regular inclusive review processes, mandatory integration of informal workers and women, strong government involvement, and multistakeholder processes to strategize and realize opportunities for vulnerable players.

Policies that legalize waste picking and include priority for the contracting of waste pickers in waste management have helped establish some of the most inclusive waste management systems in the world. Countries such as India and Brazil (Dias 2011b) have policies that include prioritizing waste pickers in the contracting of waste management services.

Such policies also allocate funding for training of waste picker organizations. These policy provisions have paved the way for sustained partnerships between government and waste picker organizations in waste management (Dias 2016) and have also incentivized small enterprises to hire waste pickers.

South Africa's 2011 National Waste Management Strategy commits the Department of Environment, Forestry, and Fisheries to "provide guidance to municipalities and industry on measures to improve the working conditions of waste-pickers," which resulted in an extensive participatory process between academia, government, and waste pickers to develop guidelines for waste picker integration (DEFF and DSI 2020). Legal priority for the contracting of waste pickers and their organizations needs government to support with adherence and enforcement (SWMRT 2019).

Through sustained investment and policy mandates, including regulatory frameworks, governments can ensure that waste systems are labor-intensive, built on existing systems, and, most importantly, inclusive of the informal waste sector. Governments are also critical to ensuring that restrictions to public access to waste, such as dumpsite closure and source segregation initiatives, are implemented in collaboration with waste pickers and they safeguard the livelihoods of women and other vulnerable workers. Some governments have helped model best practices in inclusive waste management, which include investment in decentralized, locally appropriate waste collection, sorting, processing and storage infrastructure, with reservations for usage of public land (GTZ 2011), and unrestricted, flexible capital support (SEWA 2020) in waste management and prevention industries (Samson 2020). Governments also support informal workers' organizations through excise, taxation, low-interest loans, and access to simplified contractual terms (GTZ 2011).

Governments can support the formal integration of women and informal workers by contracting waste picker organizations and paying them for service provision. Such systems exist to varying degrees in countries such as India, Argentina, Colombia, Brazil, and the United States. Governments can also ensure that waste management is provided equitably, including in low-income communities that may not be able to afford collection services. Waste pickers are ideal providers of such services since they live in low-income communities and understand the local challenges and needs.

Governments are key to supporting mechanisms to strengthen recycling markets and incentivize waste prevention, which safeguards the livelihoods of organized and unaffiliated waste pickers. This includes mandating price stability mechanisms for waste materials (Muller and Scheinberg 2003; Rudin, Van den Berg, and Abarca 2014), especially for low-value plastic materials (Ocean Conservancy 2019), reducing tariffs and taxation on recycling businesses and the import of recycling equipment, promoting domestic recycling through policy and investment, facilitating credit and investment opportunities for small recycling and waste prevention businesses, and ensuring mechanisms for financing complete waste collection and processing (especially for plastics and hazardous waste) and/or minimum recycled content mandates (GA Circular 2020).

Governments play a key role in establishing mechanisms for financial and material transparency and enforcement of policy. Transparency and accountability measures to combat corruption and facilitate open access to information are critical to ensuring that less powerful actors in the waste system, such as women, are included and can advocate the enforcement of policies that support them.

Waste systems need to be comprehensively mapped and understood from material, economic, and social perspectives so that they can be adjusted over time and safeguard the livelihoods of certain actors.

Governments and other actors that support and participate in ongoing multistakeholder forums to foster inclusive waste management can facilitate the participation of women and informal waste pickers in planning processes. Waste pickers need to be recognized as equal stakeholders in planning processes for systems to be developed that effectively integrate their skill and expertise (DEFF and DSI 2020).

For this, inclusive multistakeholder engagement in waste system planning is important, especially in places where informal workers are not well organized and may need structured opportunities for self-advocacy. Such engagements are most effective when they are ongoing. European experience shows, for example, that short-term, project-based engagement to inform inclusive waste policy was not ultimately successful over the long run (Scheinberg et al. 2016). Brazil's Waste and Citizenship Forum (Dias 2011a), by contrast, which has been in place since the 1990s, has been key to the establishment and ongoing refinement of some of the world's most successful inclusive waste management systems. Solid Waste Management Round Tables throughout India have also been helpful in bringing different stakeholders together to collaborate around inclusive waste management and provide recommendations to government (SWMRT 2019). Multistakeholder forums can be ineffectual when they are rushed, are unable to meaningfully include informal workers, or are not committed to collective coproduction of ideas and strategies.

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Governments play a critical role in empowering citizens and facilitating access to resources, capacity, and knowledge. Governments that institutionalize gender mainstreaming training, establish targets for the representation of women in leadership roles, and provide social protections that target women can increase and improve women's labor force participation in the waste sector. Gender-diverse workforces, including those of government agencies, also lead to a higher likelihood of gender diversity being prioritized in operations and strategy (see the case study of the West Sussex County Council in Annex 1). Toward supporting women in overcoming the challenges to formalization, governments play a critical role in redesigning social protection systems to better include the informal sector (World Bank 2020a) and ensuring affordable childcare, free primary care, accessible pensions, maternity/paternity leave, equitable access to non-predatory loans, and so on. Likewise, governments can facilitate training for NGOs, researchers, and waste sector stakeholders on gender-disaggregated data collection and analysis to broaden data sets for enhanced decision-making and collaborative action, including sustainable and equitable financing.

BOX 5: Public policy supports formal opportunities for women waste pickers in Bengaluru, India

India's Solid Waste Management Rules of 2016, which mandate the segregated collection of waste, as well as more recent bans on single-use plastics, have played a critical role in establishing stable demand for zero waste event services. Since the implementation of waste segregation and plastic ban policies, Hasiru Dala Innovations—a for-profit social enterprise focused on waste picker and women's empowerment in waste management—has seen a 30 percent increase in demand for its services. This has generated regular income for waste pickers equivalent to living wages—ranging from US$7.5 to US$11.6 daily.

Hasiru Dala Innovations, based out of Bengaluru, India, generates better livelihood opportunities for waste pickers through inclusive and environmentally beneficial business models. Through its waste management and eco-friendly events services, Hasiru Dala Innovations aims to divert 90 percent of waste away from landfills. Its workforce comprises 80 percent women. Since its inception in November 2015, Hasiru Dala Innovations has been providing event waste management services in which waste pickers are engaged to provide housekeeping and event waste management, ensuring that waste generated is sent for recycling or composting, leaving minimal to zero waste to landfill.

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5. Recommendations for gender-inclusive waste management

Getting started

Improving plastics waste management, and waste management overall, in ways that are socially inclusive demands the preservation and improvement of waste prevention livelihoods, including waste picking (recycling), repair, and reuse, with particular emphasis on the most precarious workers. In some places, this means preserving or transforming the livelihoods of thousands of workers, most of whom are not organized.

1.

The crafting of inclusive waste management systems requires **consistent and meaningful engagement with affected workers through multistakeholder platforms** and careful **mapping and research** to identify those workers—efforts that governments, civil society, and research institutions should immediately put into practice in their communities. Civil society and labor organizations can support the organizing of workers through training and regular meetings, with funding from the government and the private sector. The government, with support from civil society, should also begin to craft public policies that prioritize waste pickers for contracts and to promote waste prevention efforts such as reuse and repair as well as ensure labor and social protections.

Supporting the organization of workers such as waste pickers is usually a long-term project, while improvements to waste management are urgently needed. But many of the gaps in waste management systems can be quickly filled by relatively low-barrier work that can also serve as an opportunity around which workers learn to provide services and work collectively.

2.

Early-stage goals should include piloting and establishing waste collection and management initiatives that **fill immediate gaps in waste systems** while also supporting collective organizing and coalition building. For example, expanding litter and household waste collection services to all residents, including those in informal settlements, can immediately improve health and environmental outcomes and can generate relatively low-barrier jobs and opportunities for waste pickers and women to organize around the provision of services. Such opportunities can also be starting points from which organizations engage in other formal waste management and prevention work, including disaster response, recycling, reuse, and repair. Individual workers can be hired by municipalities, civil society, or private companies, but waste picker organizations are much better equipped to provide long-term support to workers and should be encouraged and supported wherever possible. If policies and taxation systems are not in place yet to finance such efforts, governments and civil society should hold the private sector accountable to provide financing voluntarily until mandatory financing measures are in place.

3.

Ensuring access to public space and infrastructure, as well as financing, is also essential for waste pickers and other waste prevention workers to remain and thrive within materials management systems.

Solidifying the role of workers in managing materials that should ultimately be minimized, if not eradicated, illustrates the importance of a concept such as Just Transition, which must consider livelihoods as adaptive to the material management needs at the time but which are also preparing for a future material economy that is necessarily less dependent on disposability. Had this been a key consideration 80 years ago, when plastics began to take the stage, societies would have been much more cautious about the proliferation of disposable goods and would have done a better job of preserving reuse and repair livelihoods. Amid growing investment in recycling and waste collection, for example, we must not let existing reuse and repair livelihoods fall away. Furthermore, waste pickers who are dependent on disposable materials that will ultimately begin to dwindle as our economies dematerialize can eventually transition into reuse and repair-oriented work.

4.

The **provision of universal social protections, and related labor protections,** can help enable workers navigate systemic transitions. In this sense, social protections can also create a more enabling environment for change and experimentation in materials management systems. The private sector has historically and presently relied on the externalization of environmental, labor, and social protection costs to maintain a material culture rooted in disposability. Governments should thus consider how the private sector can contribute to the provision of universal social protections, ideally routed through government systems.

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These basic recommendations provide a guide for getting started. The following recommendations add detail to the ways in which gender-inclusive and socially inclusive waste management can be implemented.

The recommendations provided in this chapter are rooted in the experiences of women and waste pickers in South Asia as well as other parts of the world and can serve as a guide for improving both waste management and decent work for informal waste workers and women. These recommendations are relevant to all waste prevention workers, especially women, and those recommendations more likely to be 'transformational'—that is, leading to structural, substantive, and long-term change in favor of greater inclusion—are in bold (see Figure 4 for a summarized view).

Intersectional and gender-inclusive approach to ensure fair participation for the most marginalized

Gender is inherently an intersectional issue. It extends beyond a male-female duality and exists alongside and in interaction with other identity markers (race, socioeconomic status, sexual orientation, and so on) which together can shape the advantages or disadvantages a person experiences throughout his/her life. Because women fill the most informal roles in South Asia's waste sector, a gender-inclusive approach to plastics waste management must include strategies to integrate the informal sector—allowing for the fact that women themselves are a heterogeneous group. Similarly, integration of informal workers should take an intersectional and gender-based approach to reach the most vulnerable.

Unless the most vulnerable workers are accounted for and included, formalization processes risk displacing those who cannot match the demands of new systems and economies and at the same time losing many valuable skills and expertise. Economies must accommodate the informal alongside the formal (Chen 2012), with sufficient low-barrier but decent work opportunities to meet the needs of those able to work.

Ensure safety, health, and sanitation

Improving both social protections and the organization of waste management systems is critical to the health of formal and informal workers as well as to ensuring safety for women who may face risks while searching for places to find or dispose of waste materials or use the bathroom. Thus, measures to reduce pollution and material toxicity and access to social protections such as health care and workers compensation are both essential to health and safety. While the ideal is that a baseline of minimum social protections and safe working conditions be legislated and guaranteed by the state, private companies, governments, and organizations also have a duty of care to their employees and workers (both full-time salaried and contract based)—whether or not the state has legally mandated a framework for their responsibility. Taking such action makes employers more desirable and competitive in their industries.

Recommendation: Ensure safety, health, and sanitation	Waste pickers and civil society	Public sector	Private sector
Legislate social protections that are rights based and universal in scope, including free primary medical care, workers compensation, and pension or savings schemes.		■	
Implement waste management policies that include public waste collection and doorstep segregated waste collection and litter collection for all residences, including in informal settlements. This can be financed through a combination of mechanisms such as taxation, user fees, and, if designed equitably, EPR.		■	
Integrate informal workers and their organizations into disaster risk management plans and national COVID-19 recovery plans.		■	
Offer employer-sponsored health care and worker compensation to all employees—whether contract based or salaried.	■	■	■
Register workers and issue ID cards, with attached social benefits. Support waste picker organizations in registering workers.	■	■	■
Implement policies to phase out harmful chemicals used in packaging plastics such as BFRs, BPAs, phthalates, and lead; ban harmful plastics such as vinyl and polystyrene (Shah 2020); and tax the import of plastic products and virgin plastic.		■	■
Ensure that employees are provided with correctly sized and gender-inclusive industry standard PPE and both employees and subcontractors are properly trained for handling hazardous materials. Enforce compliance with legal regulations on company premises and monitor subcontractors.	■	■	■
Provide access to counseling and domestic violence resources.	■	■	■
Ensure access to safe restrooms and clean water for washing and drinking.	■	■	■

Ensure fair remuneration and support for unpaid work

Growing women's labor force participation starts at home, where women need more support from partners in unpaid home care and community care duties to dedicate time to paid work. Policies that are gender equal and inclusive of those with responsibilities for caring for sick, elderly, or child family members are also key to supporting women. Labor protections can help ensure that women and waste pickers win the rights to such measures and can participate in defining what they need. Finally, waste systems should be regulated to ensure that materials have and can maintain value to incentivize their recovery and keep both the system and its workers resilient to market shocks.

Recommendation: Ensure fair remuneration and support for unpaid work	Waste pickers and civil society	Public sector	Private sector
Establish policies, mandates, and funding mechanisms for the integration of the informal sector (Grambangla Unnayan Committee ChildHope UK, and Big Lottery Fund 2017a; GTZ 2011; SWMRT 2019) and specifically its female workforce, including the participatory development of integration guidelines and proposals. These should consider the constraints and responsibilities that workers face in balancing a livelihood with unpaid work.	■	■	■
Implement policies that close gaps between workers who have unpaid care work and those who do not, including affordable childcare and daycare (especially near dumpsites and in low-income communities), and paid parental leave. Implement gender-equal pay policies.		■	■
Fully fund waste management services—including litter collection—as essential services, such that the labor to perform them is not reliant on volunteer labor.		■	■
Target both men and women in waste management and consumption sensitization communications, and encourage men to share the burden of sustainable household waste management and shopping.	■	■	■

Ensure representation of women and waste pickers in research and data

Representation in research and data is essential for accessing social and labor protections and to the advocacy and visibility necessary to earn contracts and other forms of integration. Thorough research also enables the identification and engagement of key stakeholders as well as the identification of gaps and opportunities in a materials management system. Broadly speaking, gender-disaggregated country-level data on occupations and employment relationships are critical to understanding the ways that policy and investment affect decent work over time.

Recommendation: Ensure representation of women and waste pickers in research and data	Waste pickers and civil society	Public sector	Private sector
Holistic mapping of the entire waste value chain (Masood and Barlow 2013; Muller and Scheinberg, 2003; Samson 2020; SWMRT 2019), including gaps, employment realities, opportunity distribution, waste pickers and their organizations and allies, and existing waste prevention livelihoods.	■	■	■
Collect disaggregated gender and labor data through country-level statistics bureaus and labor force surveys. Include informal waste work as an occupational category, with distinctions made between own-account workers, dependent contractors, and independent contractors, as well as unpaid work performed for subsistence.		■	
Strengthen research, communications, and organizing networks among organizations of workers in the informal economy.	■	■	■
Train NGOs, researchers, government, the private sector, and waste sector stakeholders on gender-disaggregated data collection and analysis, to align with sustainable development aspirations and international best practices for data gathering on labor and employment relationships.	■	■	■
Assess the impacts of policies, technologies, and other interventions on gender inclusion and opportunity distribution in the waste sector.		■	
Build robust traceability systems and audit supply chains to understand a system's actors and their demographics, conditions, benefits, and employment relationships.			■
Programs that report on jobs generated should consider the livelihoods displaced as a result (DEFF and DSI 2020).	■	■	■

Ensure access to education, information, and influence

Marginalized groups—such as women and informal waste prevention workers—often find their agency undermined by a lack of access to information and influence. Addressing this challenge requires structural and institutional changes to enable these groups to share power in decision-making. Inclusive planning processes such as multistakeholder forums in the waste sector are useful to supporting these objectives. Consultation alone, however, is not enough; marginalized groups need support in self-organization, institutional allies, and training to understand the issues and their political implications.

Recommendation: Ensure access to education, information, and influence	Waste pickers and civil society	Public sector	Private sector
Facilitate inclusive planning processes to define, plan, and enable gender and informal sector integration in waste management policies, practices and research (Aidis and Khaled 2019; Circle Economy 2020; Conlon 2021; Dias 2011a; Samson 2020; Scheinberg et al. 2016;; SWMRT 2019). In contexts where cultural, economic, or logistical constraints make it difficult for women's voices to be heard, women-only consultations may also be important (Scheinberg, Muller, and Tasheva 1999).	■	■	■
NGOs, government, researchers, workers organizations, and the private sector all need capacitation and resources to support informal workers and women to self-organize (GTZ 2011; Ocean Conservancy 2019). This can include promoting environmental identity formation and collective networking through shared advocacy campaigns and capacity-building exchange opportunities.	■	■	■
Ensure that workers have labor protections such as the right to association and collective bargaining and are engaged in the coproduction of grievance mechanisms (Madhav and von Broembsen 2021).	■	■	■

Recommendation: Ensure access to education, information, and influence	Waste pickers and civil society	Public sector	Private sector
Train waste pickers on topics that they identify, with common topics including leadership, institution building, digital literacy, data collection, collective bargaining, research and access to information, democratic processes, health, waste management and policy, legal compliance, financial management, and environmental issues.	■	■	■
Mandate organizational, financial, and material transparency and public access to information (SWMRT 2019).	■	■	■
Establish incentives or targets, with reporting and accountability mechanisms, for gender inclusion (UNEP-IETC and GRID-Arendal 2019), including gender equity in recruitment, retention, and promotion, as well as representation in leadership in the executive bodies of waste management associations and departments.	■	■	■
Hire inclusion specialists with experience in marginalized waste worker communities.	■	■	■
Fund advocacy campaigns and develop communications to destigmatize the work of waste pickers (Masood and Barlow 2013; Samson 2015) and women in the waste sector and promote proper and equitable waste management.	■	■	■
Develop research results, systems explanations, and training content that are visually oriented, inclusive, and simplified in ways to translate well into worker training content.	■	■	■
All stakeholders within the materials management sector should provide gender mainstreaming training for men and women (Dias and Fernandez 2012; Dias and Ogando 2015) (UNEP-IETC and GRID-Arendal 2019)	■	■	■

Ensure access to capital, land and infrastructure

Waste picker groups, as well as women and other marginalized entrepreneurs in the sector, need public and private investment in decentralized, sorting, processing, and storage infrastructure. To better enable this, finance providers need to fund such facilities in a way that ensures that workers in the informal economy benefit from new investment in the waste sector. Rather than simply viewing integration and formalization as an increased cost, the waste sector can increase opportunities to benefit from working in partnership with workers and waste picker organizations—particularly through supply chain contracting, where evidence suggests that diversifying procurement to include smaller suppliers can be financially more efficient (IFC 2015).

Recommendation: Ensure access to capital, land, and infrastructure	Waste pickers and civil society	Public sector	Private sector
Prioritize waste picker organizations and women in contracts for service provision.	■	■	■
Flexible funding for experimentation and piloting of waste picker integration (Masood and Barlow 2013; Samson 2020) and women-led projects that fill gaps in the waste system and allow for adaptive management	■	■	■
Reserve the usage of land and infrastructure for waste picker organizations (GTZ 2011).		■	
Provide unrestricted, flexible capital support (SEWA 2020; Samson 2020) and support through excise, taxation, low-interest loans, and simplified contractual terms (GTZ 2011).	■	■	■
Ensure equitable access to credit for waste pickers and their organizations (Muller and Scheinberg 2003; Rudin, Van den Berg, and Abarca 2014).	■	■	■
Reduce taxes on recycling businesses, and reduce tariffs on the import of recycling equipment and infrastructure.		■	
Develop green bonds for gender, solid waste management, and plastics reduction.	■	■	■

Build from what exists and with appropriate technology

Organizations working to incorporate social and labor considerations into the circular economy concept increasingly recognize that a Just Transition needs to be labor intensive, including a certain degree of manual roles in collection, sorting, and processing (Circle Economy 2020). Furthermore, given the existing skill base among informal workers and the highly distributed nature of waste, organizations recognize that such an approach can also be cost efficient. New infrastructure and technology should match the skill sets of existing actors, and efforts to adopt technology in the sector should not lead to the preclusion existing workers, including those who are not affiliated with organizations or who cannot adapt to new technology. Investing in decentralized, lower-tech systems that can better accommodate flexibility and adaptability will also better accommodate a future with less waste. It is also important to recognize that waste prevention efforts such as reuse and repair generate more jobs than other waste management options such as incineration, disposal, and even recycling (GAIA 2021a).

Recommendation: Build from what exists with appropriate technology	Waste pickers and civil society	Public sector	Private sector
Develop plans for technologically appropriate, decentralized materials management systems that maximize employment opportunities and integrate what already exists in the informal waste sector (Aidis and Khaled 2019; Beall 2006; Chikarmane 2012; Gutberlet et al. 2016; Madsen 2005; Samson 2020).	■	■	■
Public trash and recyclables receptacles should not be locked,[14] and there should be public access to the commercialization of materials. Restrictions on public access to waste, such as source segregation initiatives or dumpsite closure, should trigger institutional mandates for livelihoods safeguarding/ Just Transition such as reskilling, job placement, and compensation.		■	■
Develop and promote products that are reusable, repairable, and recyclable (in that order).	■	■	■
Implement 'right-to-repair' policies and ban single-use packaging through policy that includes funding to promote local alternatives (Shah 2020; UNESCAP 2021.		■	
Ensure that discarded materials have value by: • Mandating price floor mechanisms for waste materials (Muller and Scheinberg 2003; Rudin, Van den Berg, and Abarca 2014), especially for low-value plastic (Ocean Conservancy 2019), and • Mandating minimum recycled content in products (GA Circular 2020) and setting recycling and reuse targets (not including chemical recycling).		■	■
Develop digital tools that are accessible to different literacy levels (that is, those who may not be literate in reading and writing)	■	■	■

14. See additional recommendations for reducing hazardous waste, including the phasing out of toxics, the provision of restrooms, and the implementation of segregated waste collection.

Figure 4: Theory of change for the safeguarding of women in South Asia's plastic waste management systems

Challenges/Issues/ Constraints

Burdened by unpaid work

Vulnerable to precarious work

Less visible at work and in data

Less access to education, economy, and upward mobility

More limited by technology

Key priority/transformational recommendations

- Holistic mapping of the entire waste value chain.
- Collect disaggregated gender and labor data through country level statistics bureaus and labor force surveys.
- Strengthen research, comunnications and organizing networks among organizations of workers in the informal economy

- Facilitate inclusive planning processes to define, plan, and enable gender and informal sector integration in waste management policies, practices and research.
- Strengthen capacity and resources of stakeholders including public, private, and community to support informal workers and women to self-organize
- Mandate organizational, financial and material transparency and public access to information
- Establish incetives or targets for gender inclusion.
- Ensure that workers have labor protections like the right to association, and collective bargaining

Flow of information and adaptive learning

- Legislate rights-based social protections with universal scope.
- Implement integrated waste management policies that benefit all, including informal settlements.
- Integrate informal workers and their organizations into disaster risk management plans and national COVID-19 recovery plans.

- Establish policies, mandates, and funding mechanisms for the integration of the informal sector and women.
- Implement pollicies that colse gaps in unpaid and underpaid work.

- Prioritize waste pickers and women for contracts.
- Provide unrestricted, flexible capital support, and support through excise, taxation, and low-interest loans, prioritizing waste picker organization and women.
- Reserve the usage of land for waste picker organizations.

- Develop plans for technologically-appropriate, decentralized and labor-intensive materials management systems that integrate what already exists.
- Public trash and recyclables receptacles should not be locked and there should be public access to the commercialization of materials. Restrictions on public access to waste, should trigger institutional mandates for livelihoods safeguarding.
- Develop and promote products that are reusable, repairable and recyclable, ban single-used products and promote local alternatives.

Foundation of gender-inclusive waste management

Increased representation in research and data

Increased access to education, information and influence

Strengthened safety and sanitation

Ensured fair remuneration and support with unpaid work

Increased access to capital land and insfrastructure

Build form what exists with appropriate technology

Impacts

More inclusive waste management systems for women and informal workers

More efficient and less polluting waste management systems

Healthier people communities and enviroments

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6. Conclusion

The negative consequences of plastics waste management weigh heaviest on women and informal workers, who are also disproportionately vulnerable to a rising tide of other disruptions. The future of plastics waste management in South Asia must be gender inclusive, by involving women and informal workers in the development and actualization of solutions. Informalization is further diminishing decent work opportunities, while job creation fails to keep pace with population growth. Automation and excessive reliance on volunteerism are eliminating paid low-barrier work in the waste sector. With climate change already a reality across South Asia and the world and unabated pollution necessitating dramatic corrections in the way we manage materials, coupled with the inevitable rise of technology, economic and environmental disruptions are here to stay. COVID-19, having devastated informal workers, has shined light on gaps in resilience as well as in the ability to protect the poor in the face of crisis and disruption. Stakeholders must work together to protect the poor, and women in particular, by striving for a more economically and socially inclusive sector.

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The need for swift action on pollution prevention is also clear, but this immediate need must not obscure the critical vulnerabilities facing women and informal workers in the waste management sector. Inclusive waste management can help solve both issues. Swift or poorly planned action can disproportionately affect women and other people who are not included in the solutions. Inclusive waste management presents an opportunity to solve multiple challenges at once. It stretches the concepts of waste reduction to also account for reductions in the wasting of human capital. Experiences in inclusive waste management show that workers' organizations and social movements for women and waste pickers enable the scaling of inclusion projects and are key to ensuring that women gain access to social and labor protections. As detailed in this report, the private and public sectors are critical to supporting these types of organizations and can further serve to implement the important lessons derived from effective and impactful interventions.

The region's move toward fostering a blue economy also proposes a revival of upstream opportunities in waste prevention, reuse, and repair. In South Asia, it is increasingly recognized that waste prevention cuts across various industries and includes a wide array of actors, many of whom are highly skilled in their specific trade. In the prevention of marine plastic pollution, for example, fisheries communities include skilled artisans who repair and reuse fishing gear like nets that would otherwise end up abandoned, lost, or discarded at sea. This important approach to managing what would otherwise become waste translates across economic sectors.[15] Much of this work, however, remains in the informal economy, embattled by the effects of automation, globalization, negative forms of formalization, and a material culture that values newness and disposability. Amid the rush to improve recycling and waste collection, these traditional livelihoods in reuse and repair continue to struggle and lack recognition as waste prevention occupations. Just as old materials, reuse, and repair have fallen out of fashion, support for occupations that appear old or antiquated has slipped away. These realities highlight an opportunity to support waste prevention by directing opportunity and investment toward the documentation, organization, promotion, and integration of informal waste prevention workers, including those involved in reuse and repair livelihoods. Informal waste workers at risk of losing livelihoods due to plastic bans and a shift toward material circularity can also be supported to move into reuse and repair-oriented livelihoods.

15. Other examples of informal workers in waste prevention industries such as reuse and repair include tailors, cobblers, appliance/electronics repairers, reusable or natural goods artisans and service providers such as leaf plate artisans and farmers, basket and textile weavers, tiffin system operators, metalsmiths, and secondhand goods vendors. These livelihoods transverse occupational sectors, described as market vending, street vending, home-based work, artisanry, farming, or waste picking.

BOX 6: Preventing the loss of traditional waste prevention livelihoods in Bhutan

The Samdrup Jongkhar Initiative (SJI) is a Bhutanese civil society organization that has championed zero waste ideas in the country, in part through the promotion of traditional waste prevention practices.

Traditionally, Eastern Bhutanese would carry a handmade 'gurbu', or small cup, to receive tea or other drinks served and would accept food on a handwoven 'tore', or food cloth. Food may also be packed in a handmade bamboo 'bangchung' basket and carried in a handwoven 'jola' bag. The hand production of these goods provides an important income source, particularly for rural communities. Textile weaving is an important source of livelihood for women across the country. The growing use of single-use plastics has undermined not only these livelihoods but also appreciation for traditional reuse practices.

SJI has responded by promoting the use of traditional zero waste crafts and practices as well as by recreating some of them with recycled materials to spark youth interest in the issue. They have established women's zero waste craft cooperatives in which women collect waste materials and transform them into functional objects such as baskets and bags. SJI also hires women to provide fresh banana leaves to be folded and used as plates and cups at large events. To upscale this work, SJI established a rural women's cooperative that machine presses areca nut tree husks into uniform, dry plates and cups that they sell across the country. SJI runs two craft outlets in Samdrup Jongkhar town that have established a stable market for traditional and new zero waste products.

Measures of efficiency need to account for social and environmental benefits, not simply economic factors (Harris-White 2020). Inclusive waste management that accommodates low-tech solutions such as pushcarts, as well as reuse and repair-based materials management, are often disparaged as being inefficient and inconvenient. Without accounting for the social and environmental benefits of waste management and prevention systems, solutions can too easily be implemented that may manage materials in an economically efficient way while being detrimental to both livelihoods and the environment. Informal workers and their organizations are too often displaced by calls for greater logistical and financial efficiency while not accounting for their efficiency in managing materials in more environmental ways as well as in generating employment and other social and labor benefits that incur costs from other budgets. Blue economy and circular economy solutions should be holistic in their ability to mitigate greenhouse gas emissions; prevent land, marine, and other forms of air pollution; improve sanitation and public health; and generate a Just Transition and sustainable employment and protections for those facing income insecurity.

Tackling the rising tide of plastic pollution calls for a fresh look at old solutions and the people who have long provided them. Informal waste prevention livelihoods—both upstream and downstream—present us with a massive and willing labor force capable of reforming some of our most damaging material habits. When women informal workers can access pathways to more formal and decent work that matches their needs and abilities, materials management also becomes a vehicle for mending many of the injustices of our social and economic systems.

A new 'materialism' is needed—one that rejects the disposal of materials and values the people who handle them. The materials management sector can innovate by maximizing work that is both low barrier and decent, prioritizing support for the most precarious informal workers, and strengthening the social and economic systems that enable people to help themselves.

7. Annexes

Annex 1: The business case for gender in plastics waste management

Introduction

Strong financial opportunities exist for the private sector in plastics waste management in South Asia. While development of new technology can offer commercial gains, throughout the region plastics waste management is an industry that is still primarily driven by human capital—the informal waste pickers/sorters, employees, and entrepreneurs who keep the sector running daily. Women are heavily represented in the informal waste picking sector and play a key role in household waste management.

This business case aims to highlight some of the ways companies and investors, in partnership with local and national governments, NGOs, and other stakeholders, can leverage the gender advantage in plastics waste management through addressing the needs of women as informal and formal workers, entrepreneurs, and consumers.

Benefits for the private sector include

Working with women and men in the informal sector to **increase local content,** contributing to a company's social license and good standing in the local community and **reducing** the risks of disruption or conflict as well as **reducing reputational risk** arising from gender-specific vulnerabilities in the plastics supply chain.

Generating efficiency gains by engaging with women and men in the informal sector, by harnessing the skills and expertise that female waste pickers have already acquired.

Strengthening the talent pool by including more qualified female candidates for formal employment, enabling **improvements in organizational efficiency and profit.**

Identifying and nurturing female-led enterprises, thus **expanding the pool of promising companies** to support and help to scale.

Harnessing gender insights to **better target consumers**, before and after plastic is disposed of, to improve efficiencies later in the plastics waste value chain.

Increasing gender inclusion when **engaging with the informal waste picking sector can…**

	Key issue	Business case	Case study	Key entry points
 **…generate efficiency gains through harnessing the skills and expertise that female waste pickers have already acquired**	For plastics recycling or waste management companies, successful operations depend on being able to secure a regular supply of suitable collected plastic materials as well as accurate sorting of materials. In the Global South, most of the plastic waste is still handled first by the informal sector.	Collecting and sorting requires familiarity with different types of plastics and their value and fine motor skills. In the Global South, this work is typically dominated by women in the informal sector. Contracting or subcontracting with women who have had to develop the ability to sort quickly and efficiently helps companies ensure high-quality feedstock (Krishnan and Backer 2019). Investing in training, PPE, safe equipment, and fair wages for workers—even those on contract—encourages retention and helps support smooth company operations. Women may be contracted either as independent contractors (for example, via an app) or through organized associations of waste pickers. Engaging with established organizations, associations/cooperatives or start-ups to broker the integration of informal waste workers can create more opportunities for local value creation and reduce the logistical burden of managing supply chain complexity while retaining the benefits of efficiency and productivity. Women working as part of organized structures also tend to benefit from more secure and better-waged employment—which can help companies create a more socially responsible supply chain.	In Sao Paulo, **Brazil, Dow** (owner of the largest municipal waste management operation in the city) has forged a partnership with the start-up **Boomera,** a certified B Corp, to incorporate informal waste pickers (both women and men) into its supply chains—with women particularly involved in the painstaking work of sorting materials. Boomera works through a network of established associations of waste pickers to gather and sort plastics for recycling—including those materials previously considered too difficult to process, such as disposable diapers and espresso coffee pods. The company then processes the collected materials into 'new' products that can be resold. To date these materials have included affordable musical instruments for schools, coat hangers, shoes, garments, food packaging, and tarpaulins (Vialli 2017). Since starting to work with Boomera and its networks of organized waste pickers, productivity in Dow's waste management system climbed to 70%, sales increased by 50%, and average monthly salaries rose above minimum wage (National Geographic). In recognition of its commitment to gender inclusion in the workplace, the supply chain, and the communities in which it operates, Dow has been included in the Bloomberg Gender Equality Index 2021 (Business Wire 2021).	1. Map local organizations to identify potential partners or intermediaries to interlock with the informal waste sector workers. 2. Carry out a gender assessment to better understand the needs and priorities of female waste pickers and sorters in terms of issues such as safety, equipment, health care, and childcare. 3. Offer training and access to equipment to help women waste pickers better meet the quality and volume standards/targets of the company. 4. Explore opportunities to gain government support and partnership, for example, through grants, regulatory assistance, policy incentives, or other collaboration that could help strengthen the business proposition.

Increasing gender inclusion when **engaging with the informal waste picking sector can...**

	Key issue	Business case	Case study	Key entry points
 **...increase local content, contributing to a company's social license and good standing in the local community and reducing the risks of disruption or conflict**	The Environmental Justice Atlas produces global maps of resource conflicts around the world. Its most recent release documents no fewer than 126 significant conflicts over waste management in the Global South.[16] Most of these conflicts arise from the growing trend toward privatization in the waste management industry, resulting in the informal waste sector getting pushed aside and livelihoods destroyed. Women are particularly badly affected. Without engagement with local communities and their leadership (both male and female) as well as local government institutions and an attempt to share economic benefits, companies may find their operations disrupted.	To gain the trust and cooperation of the communities in which they operate, and to prevent supply disruptions or conflict, plastics waste management companies benefit from finding ways to incorporate both male and female pickers and collectives from the informal system into their supply chains. Doing so can also be an opportunity to contribute to more gender-inclusive local economic development. A company can, for example, contract with local women's associations to provide collection and/or sorting services, assisting in registration and formalization if required. Over time, it may also facilitate access to capital and training to allow women's associations that are already trusted partners to increase their share of value by growing into supply chain aggregators—a role traditionally dominated by men. Companies can equally engage with existing leadership—which is often male—in the informal sector to explore mutually beneficial ways of incorporating them into the supply chain. For example, those with vehicles and driving skills may be trained and contracted as transporters of materials—thus aligning their incentives with the company's operational success and reducing the chances of disruption or sabotage.	In Delhi, **India,** local residents and informal waste pickers united to fiercely oppose the new **Okhla** incineration plant (Demaria, Patra and Alier 2019). Resistance came from a combination of economic threat and the backlash against dioxin pollutants from the plant, which are documented to have the most serious health impacts on pregnant women and their unborn children (WHO 2016). From the waste picking community, women (whose livelihoods stood to be worst impacted) were most vocal and active in organizing against the plant. Although the Indian authorities ultimately ruled in favor of the plant, the company spent 5 years in protracted litigation and continues to face hostility and resentment from the local community.	1. Begin community engagement early, hiring experienced advisers and creating an internal team including local women and men, to help manage expectations and understand more about community priorities and challenges. 2. Develop a gender-inclusive local content strategy and adopt a gender-smart code of conduct for engaging with local suppliers. 3. Engage with other key stakeholders with gender expertise, such as local NGOs and local government, to coordinate strategies. 4. Create a gender-inclusive, anonymous and effective grievance mechanism for anyone in the community to access (ADB 2003).

16. Environmental Justice Atlas. "EJAtlas: Mapping Environmental Justice." Environmental Justice Atlas (EJAtlas). Accessed September 6, 2021. **https://ejatlas.org/**.

Increasing gender inclusion when **engaging with the informal waste picking sector can...**

	Key issue	Business case	Case study	Key entry points
...reduce reputational risk arising from gender-specific vulnerabilities in the plastics supply chain	The structure of the informal plastics waste management sector relies on a low-paid, predominantly female base with the higher-paid positions of brokerage—such as dealers and aggregators—held mainly by men. In terms of physical safety and security, this structure leaves female pickers and sorters potentially vulnerable to exploitation and abuse. Many waste pickers begin work as children, and girl children especially are extremely vulnerable to trafficking and sexual abuse—risks that are heightened if they are homeless and/or refugees or migrants, as many are. Specific occupational health risks are also present for women (and particularly pregnant women) who are working with plastic waste and/or living in local communities where plastic waste often ends up before collection.	In sectors such as mining or construction—where there is a high degree of subcontracting, and work may be taking place in and around at-risk populations (particularly women and children who are low-income workers)—incidences of sexual abuse or exploitation in the community or workforce have the potential to significantly tarnish a company's reputation. From a health perspective, as oil and chemical companies have learned over many painful episodes of toxin exposure leading to illness, injury, and even death to workers and host communities, as well as high-profile and costly litigation, investing in prevention and protection is far cheaper than attempting damage control. BPA (a component in many hard plastics) is a known hormone disruptor; studies have linked it to increases in diabetes, heart disease, birth defects, early puberty, and high levels of certain liver enzymes. Plastics marked as 'BPA free' still often contain any number of hormone-disrupting chemicals (Stann 2020). Women who have everyday contact with BPA from plastics can have an increased risk of miscarriage, polycystic ovarian syndrome (which is known to cause infertility), baldness, breast cancer, and ovarian cysts (Cariati et al. 2019).	The **Bagong Silang Treatment, Storage, and Disposal (TSD)** facility in **Philippines** pioneered a unique partnership between the private sector, government, and donors to improve the efficiency of e-waste recycling while mitigating gender-specific risks in the supply chain. Given the high risks facing many female recyclers, the project ensured women received information and training about environmentally sound procedures and technologies for collection, disassembly, segregation, and recycling of e-waste. Results were tracked with sex-disaggregated indicators with the goal of increasing women's participation and leadership in the management of e-waste recycling. The facility was designed with women's needs in mind—providing safe and dedicated work areas for dissembling in addition to tools and protective equipment. Reflecting the gender ratio of e-waste recyclers, 70% of the dismantlers receiving the training were women (UNIDO 2020).	1. Engage a GBV expert to carry out a gender assessment. 2. Put in place and communicate appropriate GBV policies. 3. Partner with local organizations that are trusted and have expertise in GBV issues; provide referrals and a gender-inclusive grievance mechanism (ADB 2003) for any complaints to be made. 4. Provide GBV and health and safety training and resources to all contractors and workers on gender-specific risks and vulnerabilities in the company operations and supply chain. 5. Ensure that all contractors are supplied with properly fitting PPE. 6. Include female and male waste pickers in consultations about design and operation of any facilities that they will use or be expected to engage with.

Increasing gender inclusion in **the formal waste management workforce can...**

	Key issue	Business case	Case study	Key entry points
 **...strengthen the talent pool and lead to improvements in organizational efficiency and profit**	Women and men tend to assume different, unequal roles in the plastics waste management workforce, perpetuating gender inequality, limiting opportunities for women's career advancement, and leaving untapped potential on the table. Moreover, companies working in the formal sector often do not incorporate any recourse for on-the-job sexual harassment and abuse of power affecting female workers, which inhibit women's ability to engage in other functions in the value chain.	Data across industries and countries prove that when workforces are gender diverse at all levels, company performance improves. Companies and municipalities stand to benefit from closing gender gaps between existing employees through investing in training, policies, and other measures as well as through targeted efforts to recruit more women—especially in areas where they are currently underrepresented. Prioritizing diversity leads to a wider talent pool, increased variety of ideas, and more innovation and productivity. Gender diversity at the senior management and board levels has been tied to greater financial performance; a study by AmCham France found 41% higher returns on equity and 56% greater operating results in companies with more gender-diverse senior management teams (AmCham France and BIAC 2014). Spending the time and money up front to prevent sexual harassment and GBV in the workforce also reduces business costs—sexual harassment is estimated to cost a typical Fortune 500 company US$14 million per year (Parramore 2018). Company experience and extensive research also find that gender diversity in the workforce leads to improved accident rates and health and safety, as female employees have a greater tendency to comply with safety protocols and care for equipment (Newitt, Usher, and Hegewisch 2013). This does not mean that either female or male employees are more ideal than the other, but rather they bring different skills and attributes to the table. In India, Indonesia, the Philippines, and Vietnam, for example, women in the plastics waste management sector are preferred for skilled and time-intensive tasks, such as picking and sorting, that require fine motor skills (Krishnan and Backer 2019).	Gender-diverse workforces also lead to a higher likelihood of gender diversity being prioritized in operations and strategy. A study conducted of the **West Sussex County Council, United Kingdom,** found that its innovative and successful waste management and minimization practices can be attributed to the large percentage of women who hold senior management positions. These senior managers prioritized gender sensitivity issues in the county's waste management and community outreach strategies. One male senior manager said that the gender inclusivity of the County Council's waste management strategies was also aided by the young age range of many male and female senior managers, allowing for fresh ideas and innovation. West Sussex County Council's successes include winning the International Council for Local Environmental Initiatives 'Local Initiatives Award' for best practice in waste management due to its successful community consultation processes and achieving a recycling and composting rate of 20.1% in 2003, compared to the UK's national recycling rate of 14.5% for the same time period (Buckingham, Reeves, and Batchelor 2007).	1. Conduct gender audits to understand challenges with attracting, retaining, and promoting women and men employees. 2. Review and update HR policies and practices to promote gender equality, such as gender-responsive recruitment methods, equitable retention and promotion practices, parent-friendly workplace policies, and GBV and sexual harassment policies. 3. Consider offering on-site or subsidized childcare options, to allow more women to enter the workforce).[17] 4. Assess and update uniforms, PPE, and workplace design and infrastructure to support best performance by women and men employees. 5. Establish gender equality and unconscious bias training for all employees—and contractors, when possible. 6. Create or support leadership, mentorship, scholarship, training opportunities, and women's professional networks, and collaborate with academia, the government, and civil society where possible.

17. IFC. "Employer-Supported Childcare Brings Benefits to Families, Employers, and the Economy." Tackling Childcare. IFC. **https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/gender+at+ifc/priorities/employment/tackling_childcare_the_business_case_for_employer_supported_childcare**

Increasing gender inclusion when **investing in entrepreneurship and start-ups in plastics waste management can…**

	Key issue	Business case	Case study	Key entry points
..help investors expand their pool of promising companies to support and help to scale	Plastics waste management is a global challenge and requires significant innovation with the development of new technology, human ingenuity, and a range of business models to help tackle the problem. Many women-led businesses in emerging markets—particularly those in male-dominated sectors such as waste management—struggle to access capital, networks, and publicity at the same rates as their male counterparts.	Global data from entrepreneurship surveys show that women are more likely to found businesses with social and environmental goals or to aim for a 'triple bottom line' (Hechavarria et al. 2012). Given the urgency of the plastics waste management crisis, it is likely that there are many current or would-be female entrepreneurs who are interested in starting companies to become part of the solution. Identifying early-stage female-owned businesses to support with networking, capacity building, and financing can offer investors new opportunities to expand their portfolio of high-performing companies. Cross-country evidence suggests that female entrepreneurs may be more likely to make their money go further. A recent study from Boston Consulting Group studied 350 companies that had been included in the MassChallenge program. The study found that, for every dollar of investment raised, female-run start-ups generated 78 cents in revenue, whereas male-run start-ups generated only 31 cents (Abouzahr et al. 2016) Even more strikingly, women outperformed their male counterparts despite raising less money (US$935,000 versus US$2.12 million). Elsewhere, similar studies concur. A study from venture capital firm First Round Capital found that the female-led companies it had financed performed 63% better than the all-male founding teams it had backed (Kokalitcheva 2015). Further research from the Ewing Marion Kauffman Foundation found that women-led teams generate a 35% higher return on investment than all-male teams (Garaizar 2016).	In Jakarta, **Indonesia, Rebricks** is a high-growth enterprise recently founded by two women, to process and transform plastic waste into bricks for paving and construction. The women are operating in a traditionally male-dominated industry but have been able to successfully scale their operations owing to their inclusion in an incubator program and through benefiting from the mentoring of one of the cofounders' families that has a background in the construction industry (Bruce 2020). Rebricks can currently recycle the waste from 88,000 plastic sachets per day and 33 million sachets per year into building materials. In India, Sarika Kulkarni is the founder and CEO of PadCare Labs, a start-up that aims to transform the way that menstrual pads are disposed of. Currently menstrual waste is collected by informal waste pickers, the vast majority of whom are women. Menstrual waste that is collected is usually incinerated or placed into landfill—both options carrying health and environmental risks, particularly for the female waste pickers who handle this waste. Disposable pads are single-use plastic and normally take 800 years to decompose in landfills. Many pads find their way into waterways where they contribute to marine pollution. Kulkarni has harnessed her training as a designer and mechanical engineer to create safe, eco-friendly, cost-effective disposal units that can be easily fitted into public and private bathrooms. PadCare also works with the network of female waste pickers to ensure disposal units are emptied regularly. The product that is emptied from the disposal unit is sanitized and deodorized and can be recycled as paper or used as clean fuel. Female waste pickers working with PadCare are provided training, PPE, safe and dignified work, and fair wages (Kleshchenko 2020).	1. Map female entrepreneurs and would-be entrepreneurs through engagement with colleges, universities, and local entrepreneurship hubs. 2. Hold capacity-building training for promising female entrepreneurs. 3. Support female entrepreneurs to access finance. 4. Provide mentorship and networking opportunities for female entrepreneurs operating in male-dominated industries. 5. Collaborate with local and national governments and civil society to link up with any state- or national-level programs to support female entrepreneurs, and explore opportunities for public tendering for female-owned businesses. 6. Conduct assessments and provide advisory support to help start-ups embed gender goals and commitments into their operations from the early stages.

Increasing gender inclusion when **engaging with consumers on plastics waste management can...**

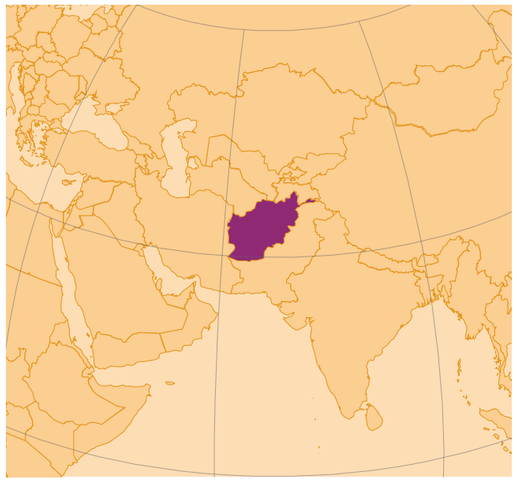
	Key issue	Business case	Case study	Key entry points
...better target consumers, both before and after plastic is disposed of	Private companies in the sector have a shared interest in improving the efficiency of plastics waste management at source. Women globally hold the primary responsibility for household waste management as well as household purchasing decisions. They are over-represented in cleaning and domestic work (both paid and unpaid) and continue to be mainly responsible for educating children about waste management and environmental issues.	In some countries, studies have shown that women are more inclined to recycle, more interested in learning what comes of waste after it is thrown away, and more socialized toward sustainability and proper disposal practices (Sumangali and Backer 2021). Women also influence 70–80% of all consumer purchasing decisions globally (Brennan 2015). However, over 75% of the waste management budget is for collection and transportation; sorting waste more properly before arrival will increase the efficiency and cost-effectiveness of waste management. It is therefore in companies' best interest to engage with women and capitalize on this increased efficiency potential, including by targeting awareness campaigns to facilitate behavior change with regard to household waste management, as well as product marketing campaigns to women. This will have a trickle-down effect to friends and family members, especially children—passing on this awareness and best practice to the next generation. Considering the roles women play in their communities, they have also been known to be successful community educators, both in voluntary and paid capacities, providing value to companies and municipalities to encourage proper sorting of waste and recycling. One study across four countries in South and Southeast Asia found that not only are women involved at various points throughout the waste value chain, but they often play a large role in recycling, repair, and reuse, such as working as scrap buyers or working in or owning junk shops (Krishnan and Backer 2019).	Hoi An, **Vietnam,** developed a long-term plan to address the community's inadequate waste management practices and the dangerous overcapacity of its landfill space (UNDP 2018). Its **Women's Union,** in partnership with the **Vietnam Office of Natural Resources and Environment** and the **Public Works Agency,** established an improved waste management scheme and employed women waste pickers to not only collect waste but also serve as community educators and advocates about proper waste management practices. The campaign targeted radio and television as well as cultural events and has reduced the amount of waste going to landfill by 70% (UNDP 2018). Consumers are increasingly discerning in their decisions to purchase goods that have lower negative environmental and social impacts—in fact, brands that showcase positive contributions to the environment and communities are more in demand than ever before. Social enterprises are emerging around the world with innovative ideas to enhance the private sector's social impacts. **RePurpose Global** is a plastic credit platform, created by Svanika Balasubramanian and her two co-founders as a result of their joint master's thesis focused on one of the largest waste dumps in Mumbai, **India.** Like being carbon neutral, RePurpose enables individuals and businesses to become 'plastic neutral' and take responsibility for their plastic footprint by funding recycling of the same amount of plastic waste they produce. Currently, RePurpose funds plastic recovery projects across six countries and is working with partners internationally to create a global plastic offset standard. Embedding gender equality into RePurpose from the start was a key goal of the founders.	1. Design gender-sensitive outreach campaigns and behavioral change communications that strategically target both women and men at the household level. 2. Propose training women as local community educators and change agents (and pay them for their work). 3. Work with local, regional, and national governments as well as civil society and community organizations, to coordinate communications and educational efforts around proper disposal practices. 4. Employ more women in plastics waste management, to better reach the local community and women's concerns.

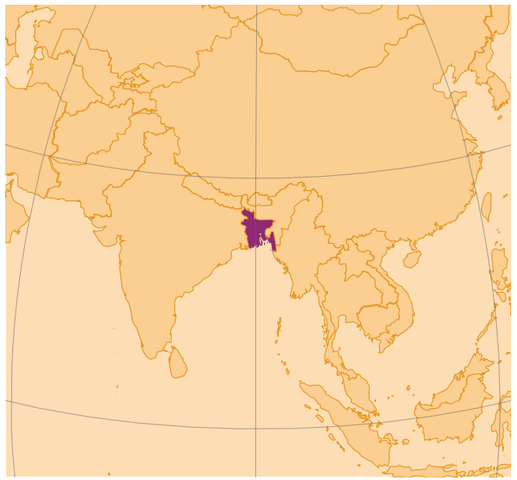
Annex 2: Solid waste management policies and regulations across the South Asia Region - a baseline assessment

Policy is defined as a law, regulation, procedure, official action, or a voluntary practice of government or another institution. Policy decisions are frequently reflected in resource allocations, decision-making, prioritization, and preparation of plans and actions. Plastic waste management can be influenced by policies in many different stages of the plastic value chain as well as contextual factors. For example, a policy on separation of waste at source will enable municipalities to enforce, create incentives, and set up collection systems.

Similarly, a policy that bans single-use plastics will change what is produced and imported as well as consumer behavior. Such policies may also allow regulatory bodies to enforce certain behavior.

Key solid waste management policies developed and approved in the South Asia Region



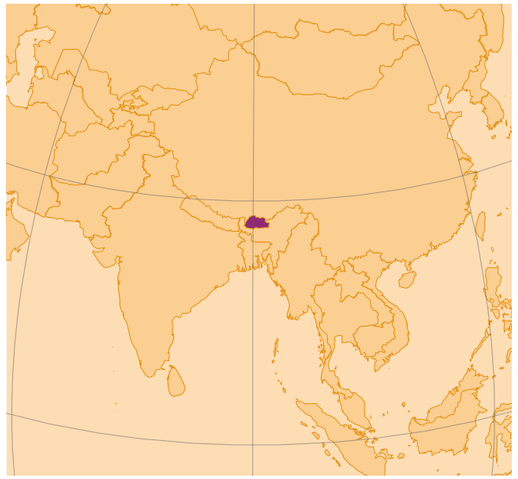


Afghanistan

Has developed environmental policies quite recently with the Environmental Law introduced in 2007, followed by waste management policies and plans. In 2012, there was a presidential announcement to ban plastic bags and a draft policy to control single-use/disposable plastics is now under development (2022). Policy effectiveness remains limited, at least partly due to the narrow scope of policies introduced to date.

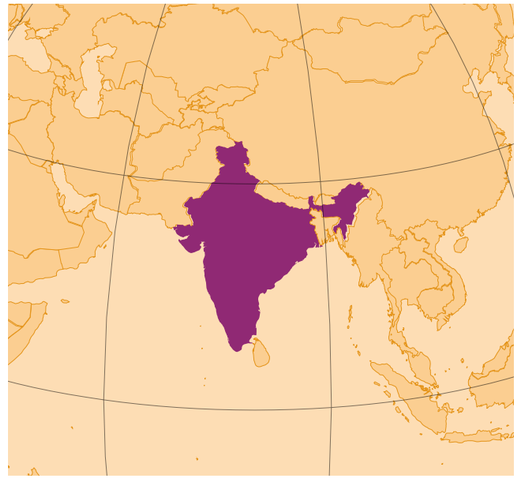
Bangladesh

Bangladesh's policy framework was developed much earlier, with the Bangladesh Environment Conservation Act coming into force in 1995 and the revised act introducing a ban on single-use plastic bags in 2002. Bangladesh has legislated for alternatives to plastic bags through jute packaging and product labelling rules introduced (2010, 2013) and amended (2017). However, this has not been effective yet due to a lack of compliance and enforcement and lack of wider enabling policies. The solid waste management rules drafted in 2005 are not approved and wider single-use plastic bans or policies have not been developed.



Bhutan

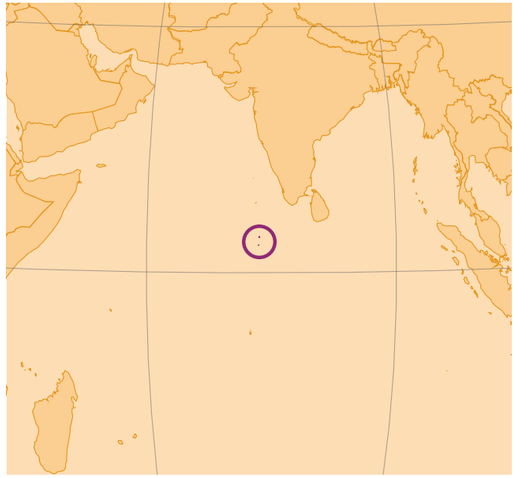
Has long-standing rules to protect the environment, developing in earnest from the Nature and Conservation Act, which came into force in 1995. Bhutan was the first country in South Asia to implement a plastics ban, with its ban on the sale and use of plastic carrier bags, doma wrappers, and homemade ice cream (Pepsi) pouches (1999). These bans have been partially effective and were subsequently reinforced in 2005, 2009, and 2019 with strengthened enforcement actions. In recent years, the focus has shifted to improving waste management with waste regulations specifying the need for segregated waste collection in the capital starting in 2015, which is now shifting from a two- to three-stream collection (wet, dry, and hazardous waste) and being replicated nationwide. This is now supported by the National Waste Strategy (2019) which set a goal for zero waste by 2030 and a flagship integrated waste management program. Bhutan has also introduced import taxes on plastic products and fiscal incentives for recycling collection and processing enterprises.



India

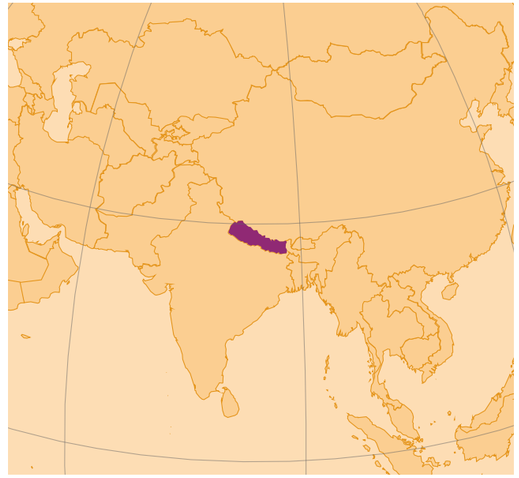
Has a wide range of policies at the national level. However, although it has twice stated that it intends to phase out single-use plastic by 2022, there is no national ban in place, but a proliferation of state-level plastic bag and wider single-use plastic bans across the country have been established. The most comprehensive bans of single-use plastic products are in Maharashtra, Tamil Nadu, Odisha, Kerala, Sikkim, and Mizoram (CSE 2020, 26). However, plastic bags are excluded from the drafted EPR framework, which as of mid 2022 remains a draft framework. The 2016 Plastic Waste Management Rules stated that MLP and single-use plastic would be phased out in two years but were watered down following corporate lobbying in 2018 and MLP sachets can now be burned instead of being phased out. Solid Waste Management Rules (2016) mandate source separation of waste, but this is still mostly not implemented, as dumping is allowed until segregation is established. India does not have any recycling standards to make new products from plastic waste but has a specification (adopted and adapted across the region) for the replacement of bitumen in road surfacing. Since 2019, India has banned the import of all plastic waste, including PET flakes, which were previously imported from Bangladesh and Nepal.

The waste import ban was initially weakened but has been fully reinstated and is largely effective. This, together with similar bans in Asia, makes it harder to export plastic waste for recycling from smaller countries. The Solid Waste Management Rules (2016) give recognition to waste pickers and collectors and make prescriptions for them to be trained, issued ID cards, and integrated into doorstep waste collection.



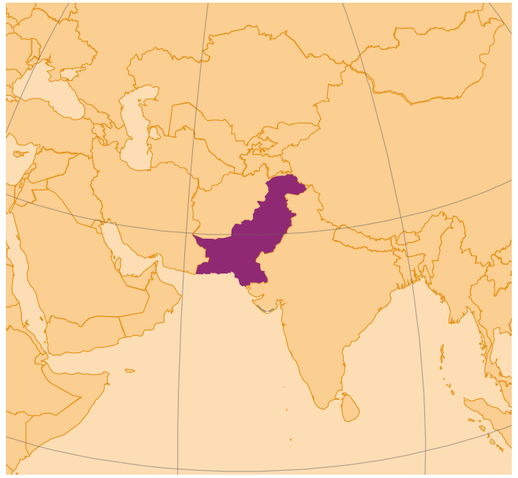
Maldives

Established its overarching Environment Protection and Preservation Act in 1983; however, specific policies to manage and control the plastic value chain have been introduced much more recently, as reflected in the Strategic Action Plan (SAP) 2019–2023) and the Single-Use Plastic Phase-out Plan introduced in 2021 which will prohibit the import of certain plastic products in June 2021 and others in December 2022. The 17th and 18th amendments to the Import-Export Act in 2020 complement this by introducing a 200 percent and 400 percent tax on bags, sacks, and straws and on plastic bottles, respectively. Although policies have stated the intention for waste collections to be segregated, this has not been implemented nationally, although initiatives now exist in some areas following regulations for these locations since 2006. A national waste management policy is anticipated in 2022 to introduce EPR and 'polluter pays' principles, but it is not clear if this will mandate waste segregation.



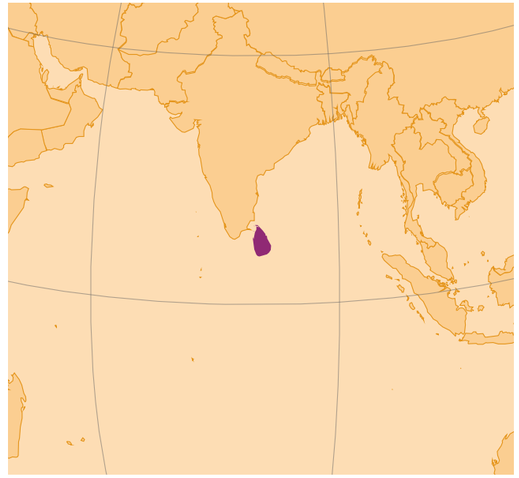
Nepal

Has had long-standing policies in waste management, but these have not been effectively implemented until more recently. A ban on plastic bags in the Kathmandu Valley was introduced following a campaign in 2015. However, this was shortly followed by a major earthquake and now has limited effectiveness. In 2015, Nepal also changed its constitution, which now requires local government areas to introduce their own environmental policies and regulations. This has led to plastic bag bans in some rural areas and national parks in particular. Nepal has a Solid Waste Management Act (2011) and Regulations (2013) that require the segregation of waste, but this requirement has not been implemented. However, this is reflected in Nepal's recent Environmental Protection Act and Regulations (2019 and 2020), and Nepal's climate commitments to the United Nations Framework Convention on Climate Change (UNFCCC) (2020) commits that by 2030 Nepal will adopt and implement source segregation and management of degradable and nondegradable waste and recycling across the country.



Pakistan

Introduced its overarching Environmental Protection Act in 1997, but plastic and wider waste management policies and regulations since then have been largely limited to introduction of state-level bans for thin single-use plastic bags (less than 15 microns) which have now been introduced across the country but are largely ineffective. Guidelines for solid waste management were drafted by 2005 but have not been introduced or implemented. Provincial climate change strategies now exist and refer to waste management, and the national and provincial Environmental Protection Agencies and the Ministry of Climate Change are working together under the Clean and Green Pakistan initiative that is expected to strengthen legislation, including on plastics waste.



Sri Lanka

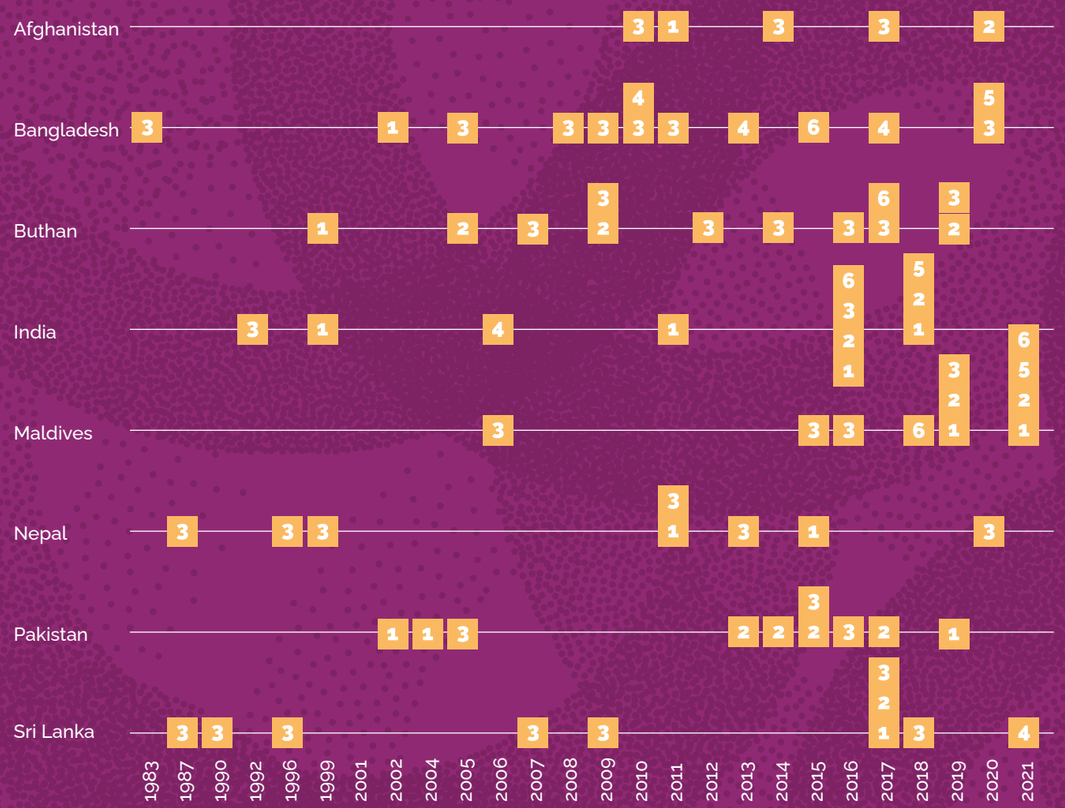
Introduced its National Environmental Act in 1980 and has had a strong progression of policies regarding waste management and, more recently, plastics management. In 2017, the government banned single-use plastics including bags less than 20 microns thick and various items including food containers from expanded polythene and banned open burning. This was relatively effective, except for the plastic bag ban. In 2021, further regulations were introduced banning the use of MLP sachets, inflatable toys, and cotton buds with plastic stems. Waste segregation is established in the most populous area, Western Province, and is now agreed to be implemented nationwide following a fatal dumpsite accident in 2017. Sri Lanka is the most advanced country in terms of regulations to support recycling of plastics into products through PET bottle manufacturers complying with a Central Environment Authority requirement to eliminate colored pigment from PET bottles, avoid PET and PVT for packaging agrochemicals, and label all plastic products.

Mapping solid waste management and plastic policies and regulations in the South Asia Region.

Typology of plastic policies and regulations No.	Type	Description and examples
1	Single-use plastic bag policies and bans	Banning specific products (for example, single-use plastic bags, Styrofoam, plastic cutlery, MLP sachets). Levies to reduce the scale of production or consumption of single-use plastics/ products could also be considered here. Single-use-plastic policies (for example, levies) and bans for plastic bags had a greater policy focus and were considered separately, as was in the global review on plastic policies by Karasik et al. (2020).
2	Single-use product/plastic bans covering a wider range of products	
3	Waste management regulations that lead to collection of waste in separate waste streams	Two main areas of waste management policy were identified as particularly pertinent to plastic leakage rates: whether there is an overall requirement to collect waste (which affects waste capture rates) and the extent of segregation of dry and/or recyclable materials (which affects the amount of plastic that can be separated out for recycling).
4	Products standards and specifications	This specifically relates to enabling the use of recycled materials to make new products or applications (for example, food contact materials) and determine requirements and restrictions on hazardous substances (for example, separate collection of plastics containing hazardous materials).
5	EPR policies	This includes any deposit return schemes (for example, for plastic bottles) and subsidies provided by producers for improved waste management and recycling.
6	Other market-based instruments including import taxes	This includes any ban tax on imports (including of plastic waste) or incentives (for example, tax relief) on capital investment and/or manufacturing that uses recycled materials or taxes to dissuade from the use of specific plastic types (for example, PVC tax).
7	Wider environmental policies	Wider environmental controls include overarching legislation that includes cultural/ behavioral change, public awareness, overall governance, and enforcement of environmental policies and legislation.

Source: Adapted from Watkins et al. (2019) and UNEP (2018) and the terms of reference of the study.

Figure A1: Plastic and waste legislation by countries and date of establishment



Policy Categories

1. Single Use Plastic Bag Policies
2. Wider Single Used Product/Plastic bans
3. Waste management regulations
4. Products standards/specifications
5. EPR
6. Other Market Based Instruments incl. Imports
7. Draft

Notes:

1. Laws that fall into more than one category are represented several times, by the symbols corresponding to each category.
2. The number in a symbol corresponds to the number of laws of the same category enacted on the same date

Sources: World Bank. 2021. "Baseline Assessment for Plastic Debris flowing into Rivers and Seas of South Asia." Washington, DC; Adapted from Center for Disease Control and Prevention **https://www.cdc.gov/policy/analysis/process/definition.htm**

References

Abouzahr, Katie, Matt Krentz, John Harthorne, and Frances Brooks Taplett. 2016. "Why Women-Owned Startups Are a Better Bet." *BCG Global,* June 6, 2018. **https://www.bcg.com/en-us/publications/2018/why-women-owned-startups-are-better-bet.**

ADB (Asian Development Bank). 2003. *Gender Checklist: Resettlement.* Asian Development Bank. **https://www.adb.org/publications/gender-checklist-resettlement.**

Agarwala, Rina. 2018. "Incorporating Informal Workers into Twenty- First Century Social." UNRISD Working Paper 2018–13. **https://www.unrisd.org/unrisd/website/document.nsf/(httpPublications)/79719256CDC0FF79C12583930038401 7?OpenDocument.**

Agarwala, Rina. 2020. "Informal Workers and the State in India." In *The Informal Economy Revisited*, edited by M. Chen and F. Carré. New York and London: Routledge Explorations in Development Studies.

Aguilera, Marvel. 2021. "María Castillo: 'No Vinimos a Ocupar Un Lugar Sino a Cambiar La Realidad De Un Sector Que Muchos No Quieren Ver.'" *Revista Ruda*, January 28, 2021. **https://revistaruda.com/2021/01/28/maria-castillo-no-vinimos-a-ocupar-un-lugar-sino-a-cambiar-la-realidad-de-un-sector/.**

Aidis, Ruta, and Delila Khaled. 2019. "Women's Economic Empowerment and Equality (WE3) Gender Analysis of the Waste Management and Recycling Sector." Banyan Global. Women's Economic Empowerment and Equality Technical Assistance Task Order Under the Advancing the Agenda of Gender Equality (ADVANTAGE) indefinite delivery, indefinite quantity (IDIQ) contract. Washington, DC: USAID.

Alfers, Laura, Ghida Ismail and Marcela Valdivia. 2020. "Informal Workers and the Social Protection Response to COVID-19: Who Got Relief? How? And Did it Make a Difference?" COVID-19 Crisis and the Informal Economy, Policy Insights No. 2, Women in Information Empowerment: Globalizing and Organizing (WIEGO). **https://www.wiego.org/sites/default/files/publications/file/PolicyInsights2.pdf.**

AmCham France (American Chamber of Commerce in France) and BIAC (Business and Industry Advisory Committee to the OECD). 2014. *Putting All Our Minds to Work: Harnessing the Gender Dividend.* **https://biac.org/wp-content/uploads/2015/02/FINAL-8798482-Deloitte-BIAC-Gender-reportff.pdf.**

Anantakrishnan, Lubna. 2021. *Exploring Opportunities for Waste Pickers in EPR: SWaCH Cooperative's System for Multi-Layered Packaging.* WIEGO and the Global Alliance of Waste Pickers.

Atal, Saloni. 2020. "Towards a Gender Equal Future of Work for Women: A Preliminary Case Study of Women in the Gig Economy in India During COVID-19." Tandem Research Issue Brief. **https://tandemresearch.org/assets/Women-Platform-TR-2020-5.pdf.**

Bateman, Alexis, and Leonardo Bonanni. 2019. "What Supply Chain Transparency Really Means." *Harvard Business Review*, August 20, 2019. **https://hbr.org/2019/08/what-supply-chain-transparency-really-means.**

Beall, Jo. 1997. "Thoughts on Poverty from a South Asian Rubbish Dump: Gender, Inequality and Household Waste." *Institute of Development Studies Bulletin* 28 (3): 73–90.

Beall, Jo. 2006. "Dealing with Dirt and the Disorder of Development: Managing Rubbish in Urban Pakistan." *Oxford Development Studies* 34: 81–97. 10.1080/13600810500496087.

BetterWork. 2019. "Bangladesh Factories Set for More Female Supervisors." *BetterWork*, March 13, 2019. **https://betterwork.org/2019/03/14/bangladesh-factories-set-for-more-female-supervisors/.**

Brennan, Bridget. 2015. "Top 10 Things Everyone Should Know about Women Consumers." *Forbes Magazine*, January 21, 2015. **https://www.forbes.com/sites/bridgetbrennan/2015/01/21/top-10-things-everyone-should-know-about-women-consumers**.

Brock, Joe, John Geddie, and Saurabh Sharma. 2021. "Big Oil's Flagship Plastic WASTE Project Sinks on the Ganges." *Thomson Reuters*, January 17, 2021. **https://www.reuters.com/article/us-environment-plastic-insight/big-oils-flagship-plastic-waste-project-sinks-on-the-ganges-idUSKBN29N024**.

Bruce, Niki. 2020. "When Ovy Met Novita: Two Women Remaking the Construction Industry with Recycled Plastic." Yahoo! Life. Yahoo!, October 27, 2020. **https://sg.style.yahoo.com/rebricks-two-women-remaking-the-construction-industry-with-recycled-plastic-082729282.html**.

Buckingham, Susan, Dory Reeves, and Anna Batchelor. 2007. "Wasting Women: The Environmental Justice of Including Women in Municipal Waste Management." *Local Environment: The International Journal of Justice and Sustainability* 10 (4). **https://doi.org/10.1080/13549830500160974**.

Business Wire. 2021. "Dow Named to Bloomberg's 2021 Gender-Equality Index." *Business Wire*, January 27, 2021. **https://www.businesswire.com/news/home/20210127005487/en/#xdm_co__f=YTZiOGJmNjEtZmY5Ny00MTQxLTg2NGEtYWE5YWYzZDU5NTAy~**.

Cardoso, Alex. 2021. "A cultura social da reciclagem, saberes e conexões - luta contra a exclusão social." Ioli Gewehr Wirth, Julian Silveira Diogo de Ávila Fontoura and Liliane Madruga Prestes. *Diálogos Insurgentes Durante a Pandemia: Vozes para uma educação (trans)formadora*. Lutas Anticapital, Marília.

Tong_stocker / Shutterstock.com

Cariati, Federica, Nadja D'Uonno, Francesca Borrillo, Stefania Iervolino, Giacomo Galdiero, and Rossella Tomaiuolo. 2019. "Bisphenol A: An Emerging Threat to Male Fertility." *Reproductive Biology and Endocrinology* 17 (1). **https://doi.org/10.1186/s12958-018-0447-6.**

Cass Talbott, Taylor. 2021. *Oregon's Bottle Bill: Opportunities and Challenges for Inclusive Waste Management*. WIEGO and the Global Alliance of Waste Pickers.

Cass Talbott, Taylor, Pinky Chandran, Cecilia Allen, Lakshmi Narayan, and Owusu Boampong. 2022. "Extended Producer Responsibility (EPR) and Waste Pickers." WIEGO Technical Brief No. 15. Manchester, UK: WIEGO.

Chakraborty, Shiney. 2021. *Women in the Indian Informal Economy*. Initiative for What Works to Advance Women and Girls in the Economy.

Chen, Martha Alter. 2012. " The Informal Economy: Definitions, Theories and Policies." WIEGO Working Paper Number 1. **https://www.wiego.org/publications/informal-economy-definitions-theories-and-policies.**

Chen, Martha Alter, and Francoise Carré. 2020. *The Informal Economy Revisited*. New York and London: Routledge Explorations in Development Studies.

Chikarmane, Poornima. 2012. "Integrating Waste Pickers Into Municipal Solid Waste Management in Pune, India." WIEGO Policy Brief (Urban Policies) No. 8. **https://www.wiego.org/sites/default/files/publications/files/Chikarmane_WIEGO_PB8.pdf**

Chikarmane, Poornima and Laxmi Narayan. 2005. *Organizing the Unorganized: A Case Study of the Kagad Kach Patra Kashtakari Panchayat (Trade Union of Waste-Pickers)*. Accessed August 14, 2020. **https://www.wiego.org/resources/organising-unorganised-case-study-kagad-kach-patra-kashtakari-panchayat-trade-union-waste-**.

Chintan. 2018. *Wastepickers: Delhi's Forgotten Environmentalists?* Chintan Environmental Research and Action Group , 2018. **https://www.chintan-india.org/sites/default/files/2019-09/Supreme%20Court%20Report_01.pdf**.

Chintan. 2021. "Chintan Plan the Ban: Roundtable on Report Release by Chintan." *Facebook*, June 30, 2021. **https://www.facebook.com/ChintanIndia.org/videos/972240770237167**.

Cingano, Federico. 2014. "Trends in Income Inequality and Its Impact on Economic Growth." OECD Social, Employment and Migration Working Papers No. 163, OECD Publishing, Paris. **https://doi.org/10.1787/5jxrjncwxv6j-en**.

Circle Economy. 2020. "The Social Economy: A Means for Inclusive and Decent Work in the Circular Economy?" **https://www.circle-economy.com/resources/the-social-economy-a-means-for-inclusive-decent-work-in-the-circular-economy.**

Circulate Initiative. 2021. *A Sea of Plastics Claims and Credits: Steering Stakeholders Towards Impact.* Insights by the Circulate Initiative. **https://d5f869f1-4310-4939-88bb-9d398556b445.filesusr.com/ugd/77554d_ef-f5a760596a456a9e565ec52bc687ba.pdf.**

Conlon, Katie. 2021. "A Social Systems Approach to Sustainable Waste Management: Leverage Points for Plastic Reduction in Colombo, Sri Lanka." *International Journal of Sustainable Development and World Ecology.* 28:6, 562-580 **https://www.tandfonline.com/doi/full/10.1080/13504509.2020.1867252.**

Cook, Ed, and Costas A. Velis. 2020. *Global Review on Safer End of Engineered Life.* Engineering X. **https://www.raeng.org.uk/publications/reports/seel-global-review.**

Corkery, Michael. 2019. "Beverage Companies Embrace Recycling, until It Costs Them." *The New York Times, July 4*, 2022 . **https://www.nytimes.com/2019/07/04/business/plastic-recycling-bottle-bills.html.**

CSE. 2020. "Managing Plastic Waste in India: Challenges and Agenda." School of Circular Economy, Anil Agarwal Environment Training Institute (AAETI), CSE. **https://www.cseindia.org/managing-plastic-waste-in-india-10352**

Dabla-Norris, Era, Kalpana Kochhar, Nujin Suphaphiphat, Frantisek Ricka, and Evridiki Tsounta. 2015. *Causes and Consequences of Income Inequality: A Global Perspective.* International Monetary Fund Strategy, Policy, and Review Department. **https://doi.org/https://www.imf.org/external/pubs/ft/sdn/2015/sdn1513.pdf**.

De Falco, Francesca, Maria Pia Gullo, Gennaro Gentile, Emilia Di Pace, Mariacristina Cocca, Laura Gelabert, Marold Brouta Agnésa, Angels Rovira, Rosa Escudero, Raquel Villalba, Raffaella Mossotti, Alessio Montarsolo, Sara Gavignano, Claudio Tonin, and Maurizio Avella. 2018. "Evaluation of Microplastic Release Caused by Textile Washing Processes of Synthetic Fabrics." *Environmental Pollution* 236: 916–925. **https://doi.org/10.1016/j.envpol.2017.10.057**.

DEFF (Department of Environment, Forestry and Fisheries) and DSI (Department of Science and Innovation). 2020. *Waste Picker Integration Guideline for South Africa: Building the Recycling Economy and Improving Livelihoods through Integration of the Informal Sector.* Pretoria: DEFF and DST.

Demaria, Frederico, Swapan Kumar Patra, and Joan Martinez Alier. 2019. "Okhla Waste to Energy Plant, Delhi, India: Ejatlas." Environmental Justice Atlas, August 18, 2019. **https://ejatlas.org/conflict/okhla-waste-to-energy-plant-india**.

Devadas, Sharmila, and Young Eun Kim. 2020. "Exploring the Potential of Gender Parity to Promote Economic Growth." Research and Policy Briefs from the World Bank Malaysia Hub.

Dias, Sonia. 2011a. "The Municipal Waste and Citizenship Forum: A Platform for Social Inclusion and Participation." WIEGO Policy Brief (Urban Policies) No. 5. May 2011. **https://www.wiego.org/sites/default/files/publications/files/Dias_WIEGO_PB5.pdf.**

Dias, Sonia. 2011b. "Overview of the Legal Framework for Inclusion of Informal Recyclers in Solid Waste Management in Brazil." WIEGO Policy Brief (Urban Policies) No. 6. May 2011. **https://www.wiego.org/publications/overview-legal-framework-inclusion-informal-recyclers-solid-waste-management-brazil.**

Dias, Sonia. 2018. *WIEGO's Position on Dump Closures.* **https://www.wiego.org/sites/default/files/resources/files/WIEGO%2520POLICY%2520STANCE%25201_DUMP%2520CLOSURES.pdf**.

Dias, Sonia, and Ana C. Ogando. 2015. "Rethinking Gender and Waste: Exploratory Findings from Participatory Action Research in Brazil." *Work Organisation, Labour & Globalisation* Vol 9 No 2: 51. 10.13169/workorgalaboglob.9.2.0051.

Dias, Sonia, and Lucia Fernandez. 2013. "Wastepickers: A Gendered Perspective." In *Powerful Synergies: Gender Equality, Economic Development and Environmental Sustainability.* New York: 153-156. UNDP. Edited by Blerta Cela, Irene Dankelman and Jeffrey Stern.

Ezeah, Chukwunonye, Jak A. Fazakerley, and Clive L. Roberts. 2013. "Emerging Trends in Informal Sector Recycling in Developing and Transition Countries." *Waste Management* 33: 2509–2519.

Ferrant, Gaelle, Luca M. Pesando, and Keiko Nowacka. 2014. *Unpaid Care Work: The Missing Link in the Analysis of Gender Gaps in Labour Outcomes*. OECD Development Centre.

Fredericks, Rosalind. 2008. "Gender and the Politics of Trash in Dakar: Participation, Labor and the 'Undisciplined' Woman." Thinking Gender Papers. Los Angeles, CA: University of California, Los Angeles, Center for the Study of Women.

Fredericks, Rosalind. 2018. *Garbage Citizenship: Vital Infrastructures of Labor in Dakar, Senegal*. Durham: Duke University Press.

GA Circular. 2019. *The Role of Gender in Waste Management: Gender Perspectives on Waste in India, Indonesia, the Philippines and Vietnam.* Report commissioned by Ocean Conservancy. **https://oceanconservancy.org/wp-content/uploads/2019/06/The-Role-of-Gender-in-Waste-Management.pdf.**

GA Circular. 2020. *Safeguarding the Plastic Recycling Value Chain: Insights from COVID-19 Impact in South and Southeast Asia*. **https://1b495b75-5735-42b1-9df1-035d91de0b66.filesusr.com/ugd/77554d_6464ccce8ff443b1af07ef85f37caef5.pdf**.

GAIA (Global Alliance for Incinerator Alternatives). 2021a. *Zero Waste and Economic Recovery: The Job Creation Potential of Zero Waste Solutions*. **https://www.no-burn.org/wp-content/uploads/Jobs-Report-ENGLISH.pdf.**

GAIA. 2021b. *An Inclusive Recovery the Social, Environmental, & Economic Benefits of Partnering with Informal Recyclers*. **https://zerowasteworld.org/wp-content/uploads/Economic-Justice-Report-SINGLES-1.pdf.**

Garaizar, Juliana. 2016. "The Rising Tide: A 'Learning-By-Investing' Initiative to Bridge the Gender Gap." *Kauffman Fellows*, May 26, 2016. **https://www.kauffmanfellows.org/journal_posts/the-rising-tide-a-learning-by-investing-initiative-to-bridge-the-gender-gap**.

Gardiner, Beth. 2019. "The Plastics Pipeline: A Surge of New Production Is on the Way." *YaleE360*, December 19, 2019. **https://e360.yale.edu/features/the-plastics-pipeline-a-surge-of-new-production-is-on-the-way**.

Ghanekar, Nikhil. 2021. "What India Must Do To Phase Out Single-Use Plastic." *Indiaspend*, June 16, 2021. **https://www.indiaspend.com/earthcheck/plastic-ban-single-use-plastic-use-and-through-enforcement-755540**.

Ghosh, Jayati. 2021. *Informal Women Workers in the Global South: Policies and Practices for the Formalisation of Women's Employment in Developing Economies.* Routledge IAFFE Advances in Feminist Economics. London and New York: Routledge.

Global Alliance of Waste Pickers. 2021. *Position on Extended Producer Responsibility*. EPR- Extended Producer Responsibility. Global Alliance of Waste Pickers. **https://epr.globalrec.org/**.

GTZ (*Deutsche Gesellschaft für Technische Zusammenarbeit*). 2011. *The Waste Experts: Enabling Conditions for Informal Sector Integration in Solid Waste Management*. **https://www.giz.de/de/downloads/gtz2010-waste-experts-conditions-is-integration.pdf.**

Grambangla Unnayan Committee, ChildHope UK, and Big Lottery Fund. 2017a. "Policy Brief: Legal Accreditation for the Informal Waste Pickers and Their Formal Involvement in Municipal Waste Management System: An Opportunity for Their Decent Occupation & Sustainable Livelihood." Dhaka. **https://grambanglabd.org/wp-content/uploads/2022/03/Policy-Brief-on-Livelihood-of-Waste-Pickers-of-Bangladesh.pdf**.

Grambangla Unnayan Committee, ChildHope UK, and Big Lottery Fund. 2017b. "Policy Brief: Education for Waste Picker Children: Ensuring Improved Access And Quality Learning." Dhaka. **https://grambanglabd.org/wp-content/uploads/2022/03/Advocacy-Briefing-Notes.pdf**

Grimaldi, Ignacio. 2019. "La Basura y Sus Contenedores Son Materia De Conflicto En La Capital De Argentina." *CNN Latinoamerica,* April 29, 2019. **https://cnnespanol.cnn.com/video/polemica-basura-inteligente-buenos-aires-grimaldi-pkg/**.

GSMA. 2021. *Connected Women: The Mobile Gender Gap Report 2021*. **https://www.gsma.com/r/wp-content/uploads/2021/06/The-Mobile-Gender-Gap-Report-2021.pdf**.

Gupt, Yamini, and Samraj Sahay. 2015. "Review of Extended Producer Responsibility: A Case Study Approach." *Waste Management and Research* 33 (7): 595–611.

Gutberlet, Jutta Jaan-Henrik Kain, Belinda Nyakinya, Michael Oloko, Patrik Zapata, and Maria Jose Zapata Campos. 2016. "Bridging Weak Links of Solid Waste Management in Informal Settlements." *Journal of Environment and Development*: 1–26.

Harriss-White, Barbara. 2020. "India's Informal Economy: Past, Present and Future." In *The Informal Economy Revisited*, edited by M. Chen and F. Carré. New York and London: Routledge Explorations in Development Studies.

Hechavarria, Diana M., Amy Ingram, Rachida Justo, and Siri Terjesen. 2012. "Are Women More Likely to Pursue Social and Environmental Entrepreneurship." In *Global Women's Entrepreneurship Research: Diverse Settings, Questions, and Approaches*, edited by Karen Hughes, Jennifer Jennings, 135–151). Cheltenham, UK: Edward Elgar.

Heintz, James. 2020. "Informality and Structures of Employment." In *The Informal Economy Revisited*, edited by M. Chen and F. Carré. New York and London: Routledge Explorations in Development Studies.

IFC (International Financial Corporation). 2013a. *IFC Jobs Study: Assessing Private Sector Contributions to Job Creation and Poverty Reduction*. **https://www.ifc.org/wps/wcm/connect/a93ef4fe-8102-4fc2-8527-5aff9af7f74f/IFC_FULL+-JOB+STUDY+REPORT_JAN2013_FINAL.pdf?MOD=AJPERES&CVID=jMRYe5J.**

IFC. 2013b. *Research: When Gender Diversity Makes Firms More Productive*. Investing in Women's Employment: Good for Business, Good for Development. World Bank. **https://openknowledge.worldbank.org/handle/10986/16257**.

IFC. 2015. *Women Entrepreneurs Are Essential for Private Sector Development in Emerging Markets*. Washington, DC: IFC.

IJgosse, Jeroen. 2019. "Waste Incineration and Informal Livelihoods: A Technical Guide on Waste-to-Energy Initiatives." WIEGO Technical Brief Number 11. **https://www.wiego.org/sites/default/files/publications/file/IJgosse_waste-incineration_informal_livelihoods_WIEGO_TB11.pdf.**

ILO (International Labor Organization). *Decent Work*. Accessed July 30, 2021. **https://www.ilo.org/global/topics/decent-work/lang--en/index.htm**.

ILO. 2013. "Sustainable Development, Decent Work and Green Jobs." International Labour Conference, 102nd Session. Geneva. **https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---relconf/documents/meetingdocument/wcms_207370.pdf.**

ILO. 2015a. *Decent Work and the 2030 Agenda For Sustainable Development*. **https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_436923.pdf.**

ILO. 2015b. "R204: Recommendation Concerning the Transition from the Informal to the Formal Economy." Adopted by the ILO at its 104th conference session. Geneva. **https://www.ilo.org/wcmsp5/groups/public/---ed_norm/--relconf/documents/meetingdocument/wcms_377774.pdf.**

ILO. 2017. *A Just Transition to a Sustainable Future: Next Steps For Europe*. **https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-brussels/documents/publication/wcms_614024.pdf.**

ILO. 2018. *Care Work and Care Jobs for the Future of Decent Work*. Geneva: ILO. **https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_633135.pdf**.

ILO. 2020a. *The COVID-19 Response: Getting Gender Equality Right for a Better Future for Women at Work.*

ILO. 2020b. *World Employment and Social Outlook: Trends 2020.*

ILO. 2020c. *Impact of the COVID-19 Crisis on Loss of Jobs and Hours among Domestic Workers.* **https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_747961.pdf**.

ILO-WIEGO. 2013. *Women and Men in the Informal Economy: A Statistical Picture.* **https://www.wiego.org/publications/women-and-men-informal-economy-statistical-picture-2nd-edition.**

Interpol. 2020. *Interpol Strategic Analysis Report: Emerging Criminal Trends in the Global Plastic Waste Market since January 2018.* **https://www.interpol.int/en/content/download/15587/file/INTERPOL%20Report%20_criminal%20trends-plastic%20waste.pdf**.

James, Gemma. 2019. *The Plastics Landscape: Risks and Opportunities along the Value Chain*. The Principles for Responsible Investment (PRI). **https://www.unpri.org/download?ac=10258**.

Karasik Rachel, Tibor Vegh, Zoie Diana, Janet Bering, Juan Caldas, Amy Pickle, Daniel Rittschof and John Virdin J. 2020). *20 years of government responses to the global plastic pollution problem: The plastics policy inventory*. Duke University. **https://nicholasinstitute.duke.edu/publications/20-years-government-responses-global-plastic-pollution-problem**

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.

Kaza, Silpa, Siddarth Shrikanth, and Sarur Chaudhary. 2021. *More Growth, Less Garbage*. Urban Development Series. Washington, DC: World Bank. **https://openknowledge.worldbank.org/handle/10986/35998**.

King, Megan F., and Jutta Gutberlet. 2013. "Contribution of Cooperative Sector Recycling to Greenhouse Gas Emissions Reduction: A Case Study of Ribeirão Pires, Brazil." *Waste Management* 33 (12): 2771–80. **https://pubmed.ncbi.nlm.nih.gov/24011434/.**

Kirchherr, Julian, Denise Reike, and Marko Hekkert. 2017. "Conceptualising the Circular Economy: An Analysis of 114 Definitions." *Resources, Conservation and Recycling* 127: 221–232. **https://www.sciencedirect.com/science/article/pii/S0921344917302835?via%3Dihub.**

Kleshchenko, Lidia. 2020. "Women in Green: Tackling Hygiene Waste through Innovation." *World Intellectual Property Organization (WIPO) Green*, March 6, 2020. **https://www3.wipo.int/wipogreen/en/news/2020/news_0007.html**.

Le Manh Thang / Shutterstock.com

Kokalitcheva, Kia. 2015. "This VC Firm Found That Female Founders Actually Do Better than Their Male Peers." *Fortune*, July 29, 2015. **https://fortune.com/2015/07/29/female-founders-better-vc/**.

Lawson, Max, Anam Parvez Butt, Rowan Harvey, Diana Sarosi, Clare Coffey, Kim Piaget, and Julie Thekkudan. 2020. "Time to Care: Unpaid and Underpaid Care Work and the Global Inequality Crisis." *Oxfam International*, January 20, 2020. Oxford: Oxfam International UK.

Lobo, Susy, Maritza Marin, Vanessa Rudin, and Fiorella Salas. 2016. *Analysis of the Challenges in the Development of the Recycling Value Chain in Central America*. Washington, DC: Inter-American Development Bank (IDB).

Lopez-Acavedo, Gladys, and Raymond Robertson. 2016. *Stitches to Riches? Apparel Employment, Trade, and Economic Development in South Asia*. Directions in Development. Washington, DC: World Bank. doi:10.1596/978-1-4648-0813-5.

Madhav, Roopa, and Marlese von Broembsen. 2021. "Informal Workers, Social Audits and Human Rights Due Diligence in Supply Chains." *WIEGO blog series.* February 4, 2021. **https://www.wiego.org/blog/informal-workers-social-audits-and-human-rights-due-diligence-supply-chains**

Madsen, Catherine A. 2005. "Feminizing Waste: Waste-picking as an Empowerment Opportunity for Women and Children in Impoverished Communities." *Colorado Journal of International Environmental Law and Policy* 17 (1): 165–200.

Masood, Maryam, and Claire Y. Barlow. 2013. "Framework for Integration of Informal Waste Management Sector with the Formal Sector in Pakistan." *Waste Management and Research* 31 (10): 93–105. **http://doi.org/10.1177/0734242X13499811.**

MGI (Mckinsey Global Institute). 2015. T*he Power of Parity: Advancing Women's Equality in India.*

MGI. 2018. *The Power of Parity: Advancing Women's Equality in Asia Pacific.*

Moussié, Rachel. 2016. "Child Care from the Perspective of Women in the Informal Economy." Policy Brief for the UN Secretary-General's High-Level Panel on Women's Economic Empowerment.

Muller, Maria, and Anne Scheinberg. 2003. "Gender-Linked Livelihoods from Modernising the Waste Management and Recycling Sector: A Framework for Analysis and Decision Making." In *Gender and the Waste Economy: Vietnamese and International Experiences*, edited by V. Maclaren and T. A. T. Nguyen, 15–39. Hanoi: National Political Publisher.

National Geographic. "Recycling for a Change Program Transforms Waste Management and Lives." Don't Let It Go to Waste: Giving Plastic Waste and Workers a Second Life. National Geographic. Accessed September 1, 2021. **https://www.nationalgeographic.com/partner-content-dow-brazil-recycling-for-change/**.

Newitt, Kirsten, Alastair Usher, and Ariane Hegewisch. 2013. "Investing in Women's Employment: Good for Business, Good for Development." IFC - WINvest. World Bank Group. **https://openknowledge.worldbank.org/bitstream/handle/10986/16257/82636.pdf**.

NSS (National Sample Survey Organization). 2012. *National Sample Survey on Employment and Unemployment, 68th Round, 2011–12*. Ministry of Statistics. New Delhi: National Sample Survey Organization, Government of India.

Ocean Conservancy. 2019. *Exploring Solutions to Ocean Plastics: Supporting Southeast Asia's Informal Waste Sector*. **https://oceanconservancy.org/wp-content/uploads/2020/06/FINAL-Informal-Sector-Report.pdf**.

OECD. 2016. "Extended Producer Responsibility: Guidance for Efficient Waste Management." OECD Policy Highlights. **https://www.oecd.org/environment/waste/Extended-producer-responsibility-Policy-Highlights-2016-web.pdf.**

O'Neill, Katie. 2019. *Waste*. UK and USA: Polity Press.

Parra, Fredrico. 2020. "Colombia: How Waste Pickers Have Fought for Their Rights and Cleaned Cities during COVID-19." *International Centre for Climate Change and Development (ICCCAD)*, November 9, 2020. **http://www.icccad.net/voices-from-the-frontline/how-waste-pickers-have-fought-for-their-rights-and-cleaned-cities-during-covid-19/**.

Parramore, Lynn. 2018. "$MeToo: The Economic Cost of Sexual Harassment." Paper presented at the 2018 ASSA Conference, American Economics Association, Philadelphia, PA, January 5–7. Institute for New Economic Thinking. **https://www.ineteconomics.org/research/research-papers/metoo-the-economic-cost-of-sexual-harassment.**

Vanatchanan / Shutterstock.com

Paton, Elizabeth. 2020. "After Factory Disaster, Bangladesh Made Big Safety Strides. Are the Bad Days Coming Back?" *The New York Times*, March 1, 2020. **https://www.nytimes.com/2020/03/01/world/asia/rana-plaza-bangladesh-garment-industry.html.**

Pew and SYSTEMIQ. 2020. *Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution*.

Rani, Uma. 2020. "Old and New Forms of Informal Employment." In *The Informal Economy Revisited*, edited by M. Chen and F. Carré. New York and London: Routledge Explorations in Development Studies.

Raveendran, Govindan, and Joann Vanek. 2020. "Informal Workers in India: A Statistical Profile." WIEGO Statistical Brief number 24.

Redaelli, Silvia, and Noor Rahman. 2021. "In Pakistan, Women's Representation in the Workforce Remains Low." *End Poverty in South Asia, World Bank Blog*, June 14, 2021. **https://blogs.worldbank.org/endpovertyinsouthasia/pakistan-womens-representation-workforce-remains-low.**

Rong, Chen, and Simeon Djankov. 2018. "Gig Economy Growth Pains." *Let's Talk Development, World Bank Blog*, December 20, 2018. https://blogs.worldbank.org/developmenttalk/gig-economy-growth-pains

Rudin, Vanessa, Sophie Van den Berg, and Liliana Abarca. 2014. *Gender and Recycling: Tools for Project Design and Implementation Regional Initiative for Inclusive Recycling*. Inter-American Development Bank publication. **https://publications.iadb.org/publications/english/document/Gender-and-Recycling-Tools-for-Project-Design-and-Implementation-Regional-Initiative-for-Inclusive-Recycling.pdf**.

Rutkowski, Jacqueline. 2020. "Inclusive Packaging Recycling Systems: Improving Sustainable Waste Management for a Circular Economy." *Detritus* 13: 29–46. **https://doi.org/10.31025/2611-4135/2020.14037.**

Sambyal, Swati Singh. 2019 "No Plastic Ban: What It Means for India?" *Down To Earth*, October 3, 2019. **https://www.downtoearth.org.in/blog/waste/no-plastic-ban-what-it-means-for-india--67068**.

Samson, Melanie. 2003. *Dumping on Women: Gender and Privatisation of Waste Management*. Athlone: Municipal Services Project and the South African Municipal Workers' Union. **https://www.wiego.org/sites/default/files/publications/files/Samson_Dumping_on_Women.pdf.**

Samson, Melanie. 2015. "Forging a New Conceptualization of 'the Public' in Waste Management." WIEGO Working Paper number 32. **https://www.wiego.org/sites/default/files/publications/files/Samson-Public-Waste-Management-WIEGO-WP32.pdf**.

Samson, Melanie. 2020. *Lessons from Waste Picker Integration Initiatives: Development of Evidence Based Guidelines to Integrate Waste Pickers into South African Municipal Waste Management Systems Technical Report: Integrating Reclaimers into Our Understanding of the Recycling Economy*. South Africa: Pretoria.

Samson, Melanie. 2020a. "The Political Work of Waste Picker Integration." In *The Informal Economy Revisited*, edited by M. Chen and F. Carré. New York and London: Routledge Explorations in Development Studies.

Sandhu, Kiran, Paul Burton, and Aysin Dedekorkut-Howes. 2016. "Between Hype and Veracity: Privatization of Municipal Solid Waste Management and Its Impacts on the Informal Waste Sector." *Waste management* 59. doi:10.1016/j.wasman.2016.10.012.

Scheinberg, Anne, Maria Muller, and Evgenia Tasheva. 1999. *Integrating Gender into Community Waste Management: Project Management Insights and Tips from an Email Conference 9-13 May, 1998.* The Netherlands: WASTE. **https://www.ircwash.org/resources/gender-and-waste-integrating-gender-community-waste-management-project-management-insights.**

Scheinberg, Anne, Jelena Nesić, Rachel Savain, Pietro Luppi, Portia Sinnott, Flaviu Petean, and Flaviu Pop. 2016. "From Collision to Collaboration- Integrating Informal Recyclers and Re-Use operators in Europe: A Review." *Waste Management and Research*. 2016 Sep;34(9):820-39.

SEWA. 2020. *COVID-19 Impact on Informal Women Workers and Their Cooperatives Recommendations from SEWA Cooperative Federation*. India. **https://www.sewafederation.org/wp-content/uploads/2020/09/COVID-and-Co-ops_-Advocacy-note-from-SEWA-Cooperative-Federation_Sept.-2020.pdf**.

Shah, Dharmesh. 2020. "Ashwachch Bharat: Why India Can't Beat the Plastics Crisis Without the Cooperation of Corporations." Changing Markets Foundation, India. **http://changingmarkets.org/wp-content/uploads/2020/09/TT-INDIA_FINAL.pdf**.

Singh, Richa. 2021. *Integration of Informal Sector in Solid Waste Management: Strategies and Approaches*. Centre for Science and Environment, New Delhi. **https://www.cseindia.org/integration-of-the-informal-sector-10894.**

Stann, Eric. 2020. "Think All BPA-Free Products Are Safe? Not So Fast, Scientists Warn." *Show Me Mizzou*, February 18, 2020. News from the University of Missouri. **https://showme.missouri.edu/2020/think-all-bpa-free-products-are-safe-not-so-fast-scientists-warn/**.

Stephenson, Derek, and Isabelle Faucher. 2018. "Estudio Comparativo de Legislación y Políticas Públicas de Responsabilidad Extendida del Productor - REP Para Empaques y Envases." Iniciative Regional para el Reciclaje Inclusivo.

Sumangali, Krishnan, and Amita Backer. 2019. "The Role of Gender in Waste Management Gender Perspectives on Waste in India, Indonesia, the Philippines and Vietnam." *GA Circular and Ocean Conservancy*, June 2019. **https://oceanconservancy.org/wp-content/uploads/2019/06/The-Role-of-Gender-in-Waste-Management.pdf**.

Sustainable Solutions Corporation. 2020. *Hefty® EnergyBag® Program Life Cycle Assessment*. Prepared for Hefty (Reynolds Consumer Products). Pennsylvania, USA: Royersford. **https://www.hefty.com/sites/default/files/2021-01/Hefty-EnergyBag-Program-Life-Cycle-Assessment-Aug-2020.pdf.**

Swim, Janet K., Ashley J. Gillis, and Kaitlynn J. Hamaty. 2020. "Gender Bending and Gender Conformity: The Social Consequences of Engaging in Feminine and Masculine Pro-Environmental Behaviors." *Sex Roles* 82: 363–385. **https://doi.org/10.1007/s11199-019-01061-9.**

SWMRT (Solid Waste Management Round Table, Bangalore). 2019. *A Mirage- Assessment of Swachh Bharat Abhiyan and SWM Rules 2016: Wastepickers Perspective across India*. **https://aiw.globalrec.org/files/2020/03/Emailing-executive-summary_16th-jan_print.pdf**.

Taş Emcet, O., Tanima Ahmed, Norihiko Matsuda, and Shinsaku Nomura. 2021. "Impacts of COVID-19 on Labor Markets and Household Well-being in Pakistan: Evidence from an Online Job Platform." South Asia Gender Innovation Lab Policy Brief.

Tearfund. 2019. *No Time to Waste*. **https://www.tear.org.au/resources/no-time-to-waste**.

Tewari, Meenu. 2020. "Extending Labor Standards to Informal Workers at the Base of Global Garment Value Chains: New Institutions in the Labor Market." In *The Informal Economy Revisited*, edited by M. Chen and F. Carré. New York and London: Routledge Explorations in Development Studies.

Turban, Stephan, Dan Wu, and Letian (LT) Zhang. 2019. "Research: When Gender Diversity Makes Firms More Productive." *Harvard Business Review*, February 11, 2019. **https://hbr.org/2019/02/research-when-gender-diversity-makes-firms-more-productive**.

UNDP (United Nations Development Programme). ND. "Waste Not, Want Not: Women Leaders in Viet Nam Address Urban Waste through Innovation and Advocacy." Small Grants Programme 25th Anniversary Stories. UNDP. **https://undp.shorthandstories.com/gef-sgp-waste-not-waste-not/.**

UNDP. 2018. *Building a Socialized Model of Domestic Waste Management in Hoi AN: UNDP in Viet Nam*. The GEF Small Grants Programme (SGP), UNDP. November 27, 2018. **https://www.vn.undp.org/content/vietnam/en/home/library/environment_climate/building-a-socialized-model-of-domestic-waste-management-in-hoi-.html**.

UNDP. 2021. "In India, a Circular Economy Creates Value from Plastic Waste." *UN Development Programme (blog)*, August 20, 2021. **https://undp.medium.com/in-india-a-circular-economy-creates-value-from-plastic-waste-b1bd3c28c601**.

UNEP. 2018. *Single-Use Plastics: A Roadmap for Sustainability* (rev. 2). **https://wedocs.unep.org/20.500.11822/25496**.

Jazzmany / Shutterstock.com

UNEP-IETC and GRID-Arendal. 2019. *Gender and Waste Nexus: Experiences From Bhutan, Mongolia and Nepal.*

UNESCAP (United Nations Economic and Social Commission for Asia and the Pacific). 2019. *Closing the Loop: Innovative Partnerships with Informal Workers to Recover Plastic Waste, in An Inclusive Circular Economy Approach*. **https://www.unescap.org/resources/closing-loop-regional-policy-guide**.

UNESCAP. 2021. *Closing the Loop: Cities and Marine Plastic Pollution Building a Circular Economy*. E-learning course. **https://sdghelpdesk-elearning.unescap.org/content/courses/PLASTIC-POL/CTL-E-Learn-Brochure-Eng.pdf.**

UNIDO (United Nations Industrial Development Organization). 2020. *Informal Women Workers Organize and Learn to Safely Recycle e-Waste in Manila*. UNIDO. **https://www.unido.org/stories/informal-women-workers-organize-and-learn-safely-recycle-e-waste-manila**.

Vialli, Andrea. 2017. *Making Coat Hangers from Diapers (Startup Alça Voo Ao Transformar Lixo Em Bens De Consumo)*. Solutions&Co by Sparknews, Valor, October 27, 2017. **http://www.solutionsandco.org/project/boomera/**.

Vaidya, Poonam, Rakesh Kumar, and Deepti Sharma. 2016. "Economics and Environmental Impacts of Plastic Waste Recycling: A Case Study of Mumbai." *The Journal of Solid Waste Technology and Management*. 42(4):287-297.

Watkins, Lisa, Patrick J. Sullivan & M. Todd Walker. 2019. "A case study investigating temporal factors that influence microplastic concentration in streams under different treatment regimes." **Environmental Science and Pollution Research** 26(4). **DOI:10.1007/s11356-019-04663-8**

Weghmann, Vera. 2020. *Taking Our Public Services Back In House: A Remunicipalisation Guide for Workers and Trade Unions. Appendix- Compendium of 50 Remunicipalisation Case Studies.* Public Services International.

WHO (World Health Organization). 2016. *Dioxins and Their Effects on Human Health. World Health Organization*, October 4, 2016. **https://www.who.int/news-room/fact-sheets/detail/dioxins-and-their-effects-on-human-health**.

WIEGO. "Child Care and Informal Workers." WIEGO. Accessed September 1, 2021. **https://www.wiego.org/child-care-and-informal-workers.**

WIEGO. "Formalizing the Informal Economy." Accessed July 30, 2021. **https://www.wiego.org/our-work-impact/themes/formalization.**

WIEGO. "Reducing Waste in Coastal Cities through Inclusive Recycling." Accessed July 30, 2021. **https://www.wiego.org/rwcc.**

WIEGO. "Waste Pickers: Essential Service Providers at Risk." WIEGO. Accessed September 1, 2021. **https://www.wiego.org/waste-pickers-essential-service-providers-risk**.

WIEGO (Women in Informal Employment: Globalizing and Organizing). 2020a. *Covid-19 Crisis and the Informal Economy*. WIEGO.

WIEGO. 2020b. *Réduction des Déchets Dans les Villes Côtières Grâce au Recyclage Inclusif (ReWCC): Étude de Base Sur les Récupératrice.eur.s de la Décharge de Mbeubeuss*. **https://www.wiego.org/sites/default/files/publications/file/Re%CC%81duction%20des%20de%CC%81chets%20-%20Rapport%20d%E2%80%99e%CC%81tude-version%20web.pdf.**

WIEGO. 2021. *La Crise de la COVID-19 et L'économie Informelle: Récupératrice·Eurs de Déchets en Emploi Informel à Dakar, Sénégal*.

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%20 for%20web.pdf**.


Viewva / Shutterstock.com


Vladimir Zhoga / Shutterstock.com

Willeghems, Gwen, and Kris Bachus. 2018. *Employment Impact of the Transition to a Circular Economy: Literature Study*. SUMMA Circular Economy Policy Research Centre. Vlaanderen Circulair. **https://vlaanderen-circulair.be/en/summa-ce-centre/publications/employment-impact-of-the-transition-to-a-circular-economy-literature-study.**

Willis, Kathryn, Clémentine Maureaud, Chris Wilcox, and Britta Denise Hardesty. 2018. "How Successful Are Waste Abatement Campaigns and Government Policies at Reducing Plastic Waste into the Marine Environment?" *Marine Policy* 96: 243–49. **https://doi.org/10.1016/j.marpol.2017.11.037**.

Woetzel, Jonathan, Anu Madgavkar, Kevin Sneader, Oliver Tonby, Diaan-Yi Lin, John Lydon, Sha Sha, Mekala Krishnan, Kweilin Ellingrud, and Michael Gubieski. 2018. *The Power of Parity: Advancing Women's Equality in Asia Pacific*. McKinsey & Company. **https://www.mckinsey.com/featured-insights/gender-equality/the-power-of-parity-advancing-womens-equality-in-asia-pacific**#.

Woggsborg, Anders, and Patrick Schroder. 2018. "Nigeria's E-Waste Management: Extended Producer Responsibility and Informal Sector Inclusion." *Journal of Waste Resources and Recycling* 1 (1).

World Bank. 2016. *Leveraging Urbanization in South Asia*. World Bank. **https://www.worldbank.org/en/region/sar/publication/urbanization-south-asia-cities**.

World Bank. 2011. *Gender and Climate Change: Three Things You Should Know*. Washington, DC. **https://doi.org/10.1596/27356**.

World Bank. 2020a. *Beaten or Broken? COVID-19 and Informality*. South Asia Economic Focus (October). Washington, DC: World Bank.

World Bank. 2020b. "Care Work and Intra-Household Tensions during COVID-19: Evidence from an Online Survey of Gig Workers in India." Policy Brief, South Asia Gender Innovation Lab.

World Bank. 2020c. *Labor Force Participation Rate, Female (% of Female Population Ages 15+) (Modeled ILO Estimate) - India*. World Bank Data. **https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS?locations=IN**.

World Bank. 2021. *Women, Business and the Law 2021*. Washington, DC: World Bank. doi:10.1596/978-1-4648-1652-9.

Woroniuk, Beth, and Johanna Schalkwyk. 1998. "How Is Equality between Women and Men Relevant to Waste Disposal Systems?" Global Development Research Center (GDRC). **http://www.gdrc.info/docs/waste/007.pdf**.

Plastic waste pollution in the world's oceans and waterways has reached crisis levels, degrading the health of marine ecosystems and affecting the people and economies that they support. The South Asia Region is the third largest contributor of plastic waste globally, with 8 percent of the region's solid waste composed of plastic Three-fourths of the South Asia Region's waste ends up in the environment through open dumping. At current rates, the amount of waste generated across South Asia is expected to increase from 265 million tons per year in 2020 to 560 million tons by 2050.

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