CREATING VALUE INCLUSIVELY FROM WASTE

Thematic evaluation of the TRANSFORM programme's impact through enterprises in the plastics economy

May 2024

We TRANSFORM Lives

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Who this evaluation is for

This evaluation is researched and written for three key audiences. The findings in this evaluation will be useful for other enterprises considering entering the waste ecosystem. The second audience is donors and investors who provide grants and other types of financial assistance to social enterprises. Finally, we hope this evaluation will offer insights to think tanks and thought leaders who attempt to design and/or influence circularity.

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EXECUTIVE SUMMARY

As the TRANSFORM programme's first thematic evaluation on plastics, the purpose of this evaluation is to explore the results that five enterprises have catalysed, how TRANSFORM contributed to these results, and to discuss insights and recommendations for other enterprises, donors, and investors interested in and/or working in this value chain. The evaluation draws on results from five enterprises operating in India, Indonesia, Nigeria, and Kenya. All enterprises work with business models that bring value to different components of the plastics supply chain and, consequently, offer insights on how to influence and work with different stakeholders, while responding to different sets of business challenges.

TrashCon in India developed a first-of-its-kind patented technological solution to segregate and process municipal solid waste.

Hasiru Dala Innovations (HDI) in India work with waste collectors to fairly collect, segregate and sell Fair Trade Guaranteed plastic waste.

Taka Taka Solutions in Kenya recycles single-use plastic containers and flexible packaging in partnership with waste collectors and factories in Kenya.

Waste4Change (W4C) in Indonesia collects and recycles waste responsibly from companies and households.

More detailed enterprise case studies can be found later in the report.

THIS EVALUATION FINDS THAT ENTERPRISES DELIVERED THREE KEY SETS OF RESULTS:

1. Disrupting and successfully reimagining the supply chain: creating value, inclusively, from waste

The enterprises involved in this evaluation had to function within a supply chain with established actors, mostly informal in nature, and had to find operational models that challenged, reimagined, disrupted and/or reinforced the supply chain. Enterprises like **Hasiru Dala Innovations (HDI)** created a profit sharing model that generated more revenue for waste collectors, while **Wecyclers** incentivised at-source waste segregation to generate better quality raw materials. **TrashCon** not only developed proprietary technology to segregate contaminated waste and recycled (previously) unrecyclable waste but also challenged the plywood and pallet markets by introducing a new product made completely from Post Consumer Resin (PCR). **Taka Taka Solutions (TTS)** actively supports waste collectors with PPE and health and safety awareness training, while also creating business to business (B2B) contracts, to gather adequate quantities of waste and generate another revenue stream. The unique thing about TTS is also their focus on collection, sorting and recycling of flexibles, where many other focus on PET only. Finally, **Waste4Change** is testing a franchise model, to scale the waste management solution that it has successfully delivered in West Java, Indonesia. These enterprises concentrated their operations on different aspects of the supply chain in which they could generate both social and financial value. They influenced other stakeholders, shifted segregation behaviours, generated value from waste, and improved livelihoods.

2. Providing jobs and reliable income with a focus on women

As the enterprises involved in this evaluation started to establish viable businesses, they also created jobs: for baling machine operators, for waste sorters, and, indirectly, in the businesses within the broader supply chain. Additionally, most enterprises also generated additional income for waste collectors by creating consistent demand, offering fair prices, and sometimes purchasing previously unvalued waste like flexible plastics. Many enterprises employ an entrepreneur model, which means that they support small businesses that are run by waste collectors. Waste collectors, in turn, employ waste sorters to meet the growing demand for waste. Most enterprises positively influenced women's livelihoods, because waste collectors are often disproportionately women. Enterprises like **Wecyclers** and **HDI** also actively support women to take on managerial roles and oversee smaller businesses, where they serve as employers themselves.

3. Diverting waste from landfill

Most large cities in South and Southeast Asia, and West and Eastern Africa struggle with overflowing landfills. In Lagos, for example, only 40% of waste is recycled. The rest is dumped in formal and informal landfills and/or dumped outside homes.[1] Households need to pay the government to collect waste and there are only three operating landfills all of which are full. From 2018 to May 2023, **Wecyclers** collected 11,402,973.8 kg of waste, which is waste diverted from landfill.[2] Similarly, in 2022 **Waste4Change** diverted over 8,000 tonnes of plastic waste.[3] Similarly, in the Aurangabad Materials Recovery Facility (funded by TRANSFORM) **HDI** has collected 441,203 kg of PET and segregated 175,268 kg of waste in the first six months of 2022.[4] In just two and a half years, **TrashCon** has processed (and therefore diverted) 1,100 tonnes per day. The aspiration is 25,000 tonnes per day.[5] **Taka Taka Solutions (TTS)** was segregating 316,000 kg of recyclable waste between January and March 2022 and is now segregating 811,000 kg of waste in the quarter April-June 2023. These results demonstrate how each enterprise is positively influencing the problem of landfills, diverting and reintroducing waste into the plastics supply chain.

INSIGHTS

While the five enterprises have delivered these results, they do also note the challenges that they faced in setting up and running a successful social business in the plastics economy. On reflection, these enterprises offered seven insights for other enterprises operating in this supply chain:

INSIGHT 1

Enterprises need an adequate and reliable supply of waste (mostly PET) to sustain operations: They face low margins, uncertain and volatile prices from offtakers, and lack control over input costs. Therefore, enterprises have to rely on volumes and economies of scale to sustain a business in this sector.

INSIGHT 2

Enterprises are reliant on prices set by offtakers: Enterprises need to be better able to challenge and/or forecast how much they can charge for baled plastic. While many social enterprises choose to pay above market prices to their waste collectors, also providing PPE and other benefits, this inflates enterprises' input costs.

INSIGHT 3

Enterprises recoup greater financial value if they move higher up the plastics value chain: Margins improve for enterprises that choose to go higher up the value chain, for example, creating flakes and pellets or products that are designed for end users. However, when producing end products, enterprises should consider how to influence final offtakers and also recognise that moving higher up in the value chain entails significant capital investment and technical knowledge, which are both barriers to entry.

INSIGHT 4

It is prudent to diversify income streams and widen waste supplier networks and offtake clients: Most enterprises recycle PET. However, the PET market is vibrant and highly competitive as the value chain is relatively well established and PET is already seen as valuable waste. The HDPE, LDPE, and MLP markets are less well established. Early market entrants have to contend with greater risks but also potentially reap greater rewards.

INSIGHT 5

Technology can create efficiencies in a margin poor industry: All enterprises that tested technical solutions increased their efficiency. This includes the use of cloud software, tech platforms to create more efficient logistics, and apps to help connect waste producers to enterprises.

INSIGHT 6

It is necessary to build trust with the existing, informal waste management sector: The informal waste sector is largely wary of outsiders and new market entrants. Enterprises must work with waste collecters and aggregators, to build and sustain trust. To do so they must bring value to existing stakeholders and to guarantee steady volumes of waste for their operations.

INSIGHT 7

Enterprises may need to incentivise/educate at-source segregation: Shifting behaviours is hard at the best of times. It is even harder to ask waste producers to pay attention to their waste and segregate at-source because waste producers are not accustomed to thinking about waste and there is no incentive to segregate waste.

Summary

The TRANSFORM programme has catalysed three types of results for the five enterprises it has supported in the plastics economy. While these results have positive impacts on the lives of waste collectors and the environment, they also demonstrate that the enterprises' business models are indeed viable. The results demonstrate – to donors, investors, and other enterprises – that it is possible to successfully operate a social enterprise in the plastics supply chain.

INTRODUCTION AND BACKGROUND

This evaluation is the first of its kind for the TRANSFORM programme. TRANSFORM is a £90 million public private partnership between Unilever, the UK's Foreign, Commonwealth & Development Office (FCDO) and EY that; (i) supports early stage business models towards scale and (ii) conducts research to strengthen the evidence base for scaling inclusive businesses and behaviour change interventions.

The programme's impact aim is to help people to adopt behaviours and access products and services that lead to sustained improvements in their health and livelihoods as well as the environment. TRANSFORM tests and scales new solutions that tackle environmental challenges, improve health and wellbeing, and build inclusive economies.

As of March 2023, TRANSFORM has funded and supported 78 enterprises of which 18 focus on waste and plastics.[6] The TRANSFORM programme has supported a diverse group of enterprises that range from those that focus on technical innovations to recycle (currently) unrecyclable plastic, for example, multilayer plastics (MLP), to enterprises that respond to the livelihoods and working conditions of the informal waste picking community(ies).

The waste supply chain illustrates the complexity that an enterprise faces when responding to the waste problem. The waste supply chain includes a plethora of actors including companies that sell products (and therefore produce packaging materials), consumers of products/producers of waste, bulk waste producers (offices, factories, housing complexes etc.), waste collectors, informal offtakers, local government and their waste contractors, communities that live around landfill sites, producers of waste recycling machinery (balers, washers, belts etc.), formal offtakers, and final offtakers (FMCGs and large companies that purchase recycled materials). This list of stakeholders is certainly not exhaustive; it simply demonstrates how complex the supply chain is, and how stakeholders are reliant on other actors in the supply chain, for their livelihoods and businesses.

We reference the supply chain complexity to contextualise the results discussed in this evaluation. Many of these enterprises face significant challenges – regulatory, behavioural, entrenched agendas and informal actors that do not trust new entrants – that influence the enterprises' ability to deliver results and sustain its activities as a business.

DISTINGUISHING THE CIRCULAR ECONOMY FROM PLASTIC WASTE MANAGEMENT

Plastic waste management and plastic recycling are terms that are often used interchangeably with the 'circular economy'. It is important we make a clear distinction between the terms for this evaluation as the definitions also clarify the purpose of and boundaries of this evaluation. The Ellen MacArthur Foundation uses the following definition:

"[t]he circular economy is a system where materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting. The circular economy tackles climate change and other global challenges, like biodiversity loss, waste, and pollution, by decoupling economic activity from the consumption of finite resources."[7]

Waste management primarily refers to the collection and management of waste as it is generated, a segment of the waste supply chain. Similarly, recycling refers to the process by which waste is treated and brought back into the packaging/product ecosystem. The operations of many of the TRANSFORM funded enterprises focus on plastic waste management and recycling rather than plastic circularity. For example, if an enterprise segregates and sells plastics or produces recyclates (flakes, pellets etc.) their operations cannot be deemed to be circular because often we are unclear about the final destination and use of the recyclate.[8]

Waste management and recycling are aspects of a circular economy but are not synonyms for the circular economy. This distinction is important since this evaluation does not assess the circularity of these enterprises.

PURPOSE OF THE EVALUATION

This is a thematic evaluation that draws on five individual enterprises from the TRANSFORM portfolio, to:

- explore the nature of results that one can anticipate in this sector;
- understand the challenges enterprises are likely to face when operating in this sector
- identify insights from enterprises on what has worked for them (and why).

This evaluation is designed to answer six key evaluation questions (see following page).

EVALUATION QUESTIONS

This evaluation answers six evaluation questions, outlined below:

QUESTION 1

What impacts do TRANSFORM funded enterprises intend to have on the value chain they operate within?

(i) Why have the enterprises chosen to influence the specific link in the value chain that they operate within?

(ii) What types of solutions/technologies do these enterprises believe will work to resolve the challenge they hope to address? What do they hope to reinforce/disrupt?

(iii) What assumptions are the enterprises making that their models will lead to change and where are the gaps in the logic?

(iiii) Are there innovation gaps that enterprises will both address as well, areas where they will be gaps, within the circular economy 'system'?

QUESTION 2

What impacts have these enterprises had on the circular economy?

(i) Have these impacts emerged as expected or do we see unintended consequences?

(ii) What have we learnt about how to influence the circular economy value chain?

QUESTION 3

How have these enterprises contributed to these results?

QUESTION 4

Are there other potential pathways to achieve the same results/impacts?

QUESTION 5

What aspects of the supply/value chain have been most robust and difficult to shift?

QUESTION 6

How have these enterprises responded to challenges they have faced on their implementation pathways?

METHODOLOGY

This evaluation is the first portfolio level evaluation of the TRANSFORM programme's contribution to the effects of its grantees on the plastics economy. As the first of its kind, the methodology was designed to shed light on:

1. A wide range of effects (financial and economic, environmental, the broader value chain etc.) and;
2. Insights on what works for enterprises engaged in the plastics' ecosystem, including challenges and peculiarities inherent to this ecosystem, and opportunities to leverage.

This evaluation uses a theory-based evaluation approach to facilitate insight generation and to help create a working theory of change for enterprises engaging with the plastics economy.

WHY WE SELECTED A THEORY-BASED EVALUATION AND HOW WE DEPLOYED THE METHODOLOGY

We selected the theory-based evaluation approach to explore progress and results, as well as deliver insights on the plastics ecosystem(s). In utilising the theory-based evaluation approach, we started by explicating the theories of change for each of the enterprises.

As part of this exercise, we identified the key stakeholders involved in the respective plastic ecosystem(s). We then worked with the enterprises to identify interviews with a sample of individuals from the actor group. The theory of change mapping exercise also meant that we identified key assumptions on which an enterprise's business model is based. Since we used the theory-based evaluation approach, we were able to test these assumptions, also identifying how enterprises responded to challenges to these assumptions. We also used the theory of change to design interview questions that would facilitate an exploration of the assumptions, with numerous stakeholders.

Triangulation and validation

The theory-based evaluation approach that we deployed uses the theory of change of each enterprise as the foundation on which the evaluation is based. By speaking with numerous actors across the supply chain we were able to identify key themes and triangulate data. The perspectives we gathered from interviews with diverse actors helped piece together unique views on the nature and scale of the plastics supply chain, the role of different actors, challenges, and the regulatory and social context in which the supply chain operates.

Mapping enterprise level theories of change

Identifying key actor groups explicated in the theory of change

Designing interview questions to test the validity of the assumptions in the theory of change

Caveats and limitations to the methodology

This evaluation primarily uses qualitative data to determine what results enterprises have contributed to, how enterprises have contributed to these results, and what we can learn from these enterprises about the waste supply chain(s). The methodology, while robust in exploring and critiquing the theories of change (business models) that these businesses work with, will not deliver evidence that is representative of all such enterprises.

Also, the theory-based approach, which relies primarily on interviews with key stakeholders (and some data from written reports) in the supply chain is designed to indicate the direction of travel, and why certain results have emerged. However, this methodology does not support direct attribution of effects to key interventions much like a quantitative study might. Rather, we suggest that TRANSFORM has contributed to the results we present in this evaluation. We outline impact pathways, which stem from the support that the TRANSFORM programme has provided.

ENTERPRISE SELECTION PROCESS

We selected five enterprises from the TRANSFORM portfolio. We used a purposive sampling approach to ensure diversity of regions/countries, maturity, and focus of business model. The criteria we used are:

1. Region and country

Many of the enterprises that TRANSFORM funds, in the circular economy, operate in India. This meant making a concerted effort to identify enterprises that operate outside India. It was necessary for us to ensure regional and country variety, to help us better understand if the business models have some unifying principles or operating models. For example, if enterprises in India were struggling with contaminated waste and unable to shift end user behaviours (to segregate), was this attitude also prevalent in other countries?

2. Maturity of business

Between 2021 and 2022, many of the businesses in this sector, that TRANSFORM has funded, were validating their business models. We needed to identify enterprises that had been operating for enough time so that they could identify challenges and practically demonstrate success.

3. Focus of operations

Enterprises in the circular economy often find one entry point into the supply chain. For example, an enterprise may have a technical solution that supports automated segregation or has a machine that can process non-recyclable plastics. There are also enterprises that focus primarily on sourcing recyclable plastics (PET, for example) or work on sourcing better quality materials from end consumers, facilitating more effective segregation practices. We wanted to include enterprises that worked at different stages in the supply chain and considered disrupting/reinforcing a link in the supply chain, to deliver a variety of results (livelihoods, environmental, job creation etc.).

VALUE CHAIN

ELEMENTS/ASPECTS OF THE VALUE CHAIN THAT EACH ENTERPRISE FOCUSES ON

Name of enterprise	Improving at-source segregation	Improving working conditions and lives of waste collectors	Manually segregating and baling wet and dry waste*	Automated segregation of waste**	Proprietary tech solution to process segregated waste into end products	Creating and selling recyclate (pellets/ flakes)	Creating end products for consumer use
Wecyclers	✓	✓	✓			✓ (starting)	
Divert			✓			✓ (starting)	
TrashCon				✓	✓		✓
Oxfam SA Social Factory		✓	✓				
Taka Taka Solutions	✓	✓	✓			✓ (starting)	
Taka Taka Ni Mali	✓	✓	✓				
Sampurn Earth	✓	✓	✓			✓ (starting)	
Saltech design labs				✓	✓		✓
BoPinc	✓						
Hasiru Dala Innovations	✓	✓	✓			✓ (starting)	
Wild Enterprise			✓		✓		✓
Ashaya Recyclers		✓	✓		✓		✓

Table 1: Elements/aspects of the value chain that each enterprise focuses on (TRANSFORM portfolio, up to March 2023).

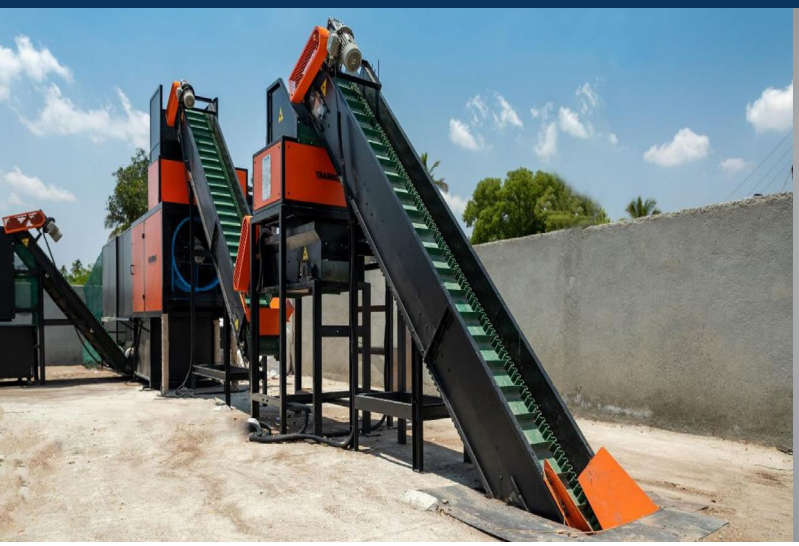
** May use conveyor belts. ** No human inputs apart from feeding waste into machine.*

This is a selection of the TRANSFORM supported enterprises working on recycling models. A full list of our portfolio of supported companies can be found on www.TRANSFORM.global

ENTERPRISE CASE STUDIES

ENTERPRISE BUSINESS MODELS AND TRANSFORM'S CONTRIBUTION

To contextualise the results we identified through this evaluation, this section lays out some background to the five enterprises we worked with – what they do, their aims/aspirations, and some history. We also lay out how the TRANSFORM grant was utilised by these enterprises. This section concludes with an overarching theory of change that we used as the framework through which we gathered results and tested assumptions, for this evaluation (see Figure 6: Plastics supply chain, page 22).



TRASHCON

TrashCon's value proposition is to serve as solution provider, replacing the entire waste chain to establish a sustainable circular economic system. TrashCon uses proprietary segregation technology, which they claim is "the world's first fully automated segregation machine for mixed waste dumped on streets, landfills, rivers and drains with at least 85% segregation efficiency."[9]

TrashCon's recycling technology includes the TrashBot™ (automated mixed waste segregation machine) and the WoW Recycler, which recycles MLP plastics to create WoW Boards™. The recycling process does not use chemicals, water or external binding agents, which TrashCon says, makes these products 15 times more recyclable. TrashCon uses these recycled products to make durable furniture and products that can replace plywood (**see Figure 1: TrashCon's business model**).

TRANSFORM support

The TRANSFORM grant helped TrashCon refine the technology of its TrashBot™ to increase the segregation capacity (from two to ten tonnes per day). The grant also contributed to the development of the WoW Recycler™ and to set up the cloud system to help TrashCon gather and improve the functionality of the WoW Recycler™.[10]

TrashCon's business model

TrashCon works with municipal government to divert waste from landfill sites to multi layer plastics centres

TrashCon uses TrashBot™ to segregate waste

TrashCon sends organic waste to biogas plants, innards to cement kilns, and MLP to the WoW Recycler™

TrashCon creates WoW Boards™ and sell to the construction industry and final offtakers.

TrashCon sells TrashBots™ to waste companies as a separate income line

Figure 1: TrashCon's business model

HASIRU DALA INNOVATIONS

Hasiru Dala Innovations Private Limited (HDI) is a for purpose company that aims to professionalise the important work of waste collectors, to improve their livelihoods and create more diversified value across the waste value chain. HDI primarily works in Bengaluru (India) and currently gathers waste from bulk waste generators (any community/ institution generating more than 100 kilos of solid waste a day). This includes residential colonies, corporate campuses, restaurants, and educational institutions. HDI supplies segregated, baled waste and/or recyclate to companies such as Unilever, Cofresco and H&M to include as post-consumer recycled material in their products **(see Figure 2: Hasiru Dala Innovations' business model).** This helps these organisations to meet their sustainability commitments.

HDI also provides event waste management services and has a joint venture to produce Compressed Biogas (CBG) and organic manure. HDI is the only multi-stream waste management company that is Fair Trade Guaranteed by the World Fair Trade Organisation (WFTO). While HDI focuses on economic justice for waste collectors, it works closely with the Hasiru Dala Trust (a charitable organisation) that focuses on social justice for waste collectors. HDI aspires to Inclusive Circularity™, the planned and deliberate inclusion of waste collectors as an integral part of the evolving circular economy value chain.

Hasiru Dala's business model

HDI builds trust with waste picker entrepreneurs

HDI helps entrepreneurs set up contracts with bulk waste providers and local government (for land)

HDI educates bulk waste generators on at-source segregation

HDI purchases segregated waste from entrepreneurs

Waste collector entrepreneurs provide employment as their business grows. HDI has a steady source of good quality, segregated waste

Figure 2: Hasiru Dala Innovations' business model

WECYCLERS

Wecyclers provides recycling services in Lagos. The company began in 2012 when only 40% of the city's waste was collected and 13% was recycled.[12] Their solution is to offer rewards for at-source segregation, with a focus on providing an additional source of income for people in low-income communities (**see Figure 3: Wecyclers' business model**).

Wecyclers operates hubs where waste can be deposited for points, which are recorded for each 'subscriber'. Initially, the points were exchanged for essential goods such as food and household items and this has since shifted to cash payouts. Wecyclers recycles cardboard, glass, and plastics. They work with local and international offtakers and have recently been funded through a development impact bond (investment from Bridges), backed by Unilever.

TRANSFORM support

Wecyclers used the TRANSFORM grant to improve operational efficiencies, by introducing balers (to reduce transportation costs). Wecyclers also used the grant to test a franchise model, to help the enterprise gather greater volumes of waste, and scale its business.[13]

Wecyclers' business model

Figure 3: Wecyclers' business model

TAKA TAKA SOLUTIONS

Taka Taka Solutions is a social enterprise that began its operations in 2011. Since then, they have grown to manage more than 60 tons of waste per day and recycle 95% of the waste they collect (**see Figure 4: Taka Taka Solutions' business model**). aka Taka Solutions have close to 650 full-time staff and operate multiple sites in the Nairobi Metropolitan Area, now having moved to Dandora to scale their operations.

TRANSFORM support

The TRANSFORM grant was used by Taka Taka Solutions to increase the scale of waste collection by setting up and expanding buy-back centres and improving the livelihoods of waste collectors.[14]

Taka Taka Solutions' business model

Figure 4: Taka Taka Solutions' business model

WASTE4CHANGE (W4C)

Waste4Change is a social enterprise established to respond to the challenge of waste management in Indonesia. The founder initially set up an NGO but then transitioned the model to operate as a social enterprise. W4C's business model aims to gather and segregate waste before it goes to landfill. In close to 30% of Indonesia's regions, the government does not collect waste. It is left in informal landfills, creating unsanitary living environments and making waste segregation financially unviable.

In 2021 W4C started working on their recycling business and started to buy waste from aggregators and waste banks (**see Figure 5: Waste4Change's business model**). W4C has also built relations with large waste suppliers and final offtake clients like Unilever Indonesia and IKEA.

TRANSFORM support

W4C utilised the TRANSFORM grant to increase efficiencies and test how to scale its business model through a franchise arrangement. The grant was used to build a platform to connect logistics with waste gathering, transportation, and data insights (to improve efficiencies). The grant was also used to purchase a baling machine and to build a franchise relationship with recycling companies in other parts of Indonesia (Bali and West Java, for example).

Waste4Change's business model

Increase volumes of waste segregated/processed through a franchise model (cost share)

Franchisees bring existing waste supply chains to W4C's business

Set up franchises to increase volumes of waste processed

Provide employment through franchises and in Waste4Change MRF

Figure 5: Waste4Change's business model

OVERARCHING THEORY OF CHANGE

As this is a theory-based evaluation, we followed the theory of change of the enterprises involved, aggregating the theory of change to create a sectoral version that we then explored during the data collection process. The theory of change below is an aggregated version of a sectoral theory of change, which collectively reflects the business models of all the enterprises involved in this evaluation (see Figure 6 below: Plastics supply chain).

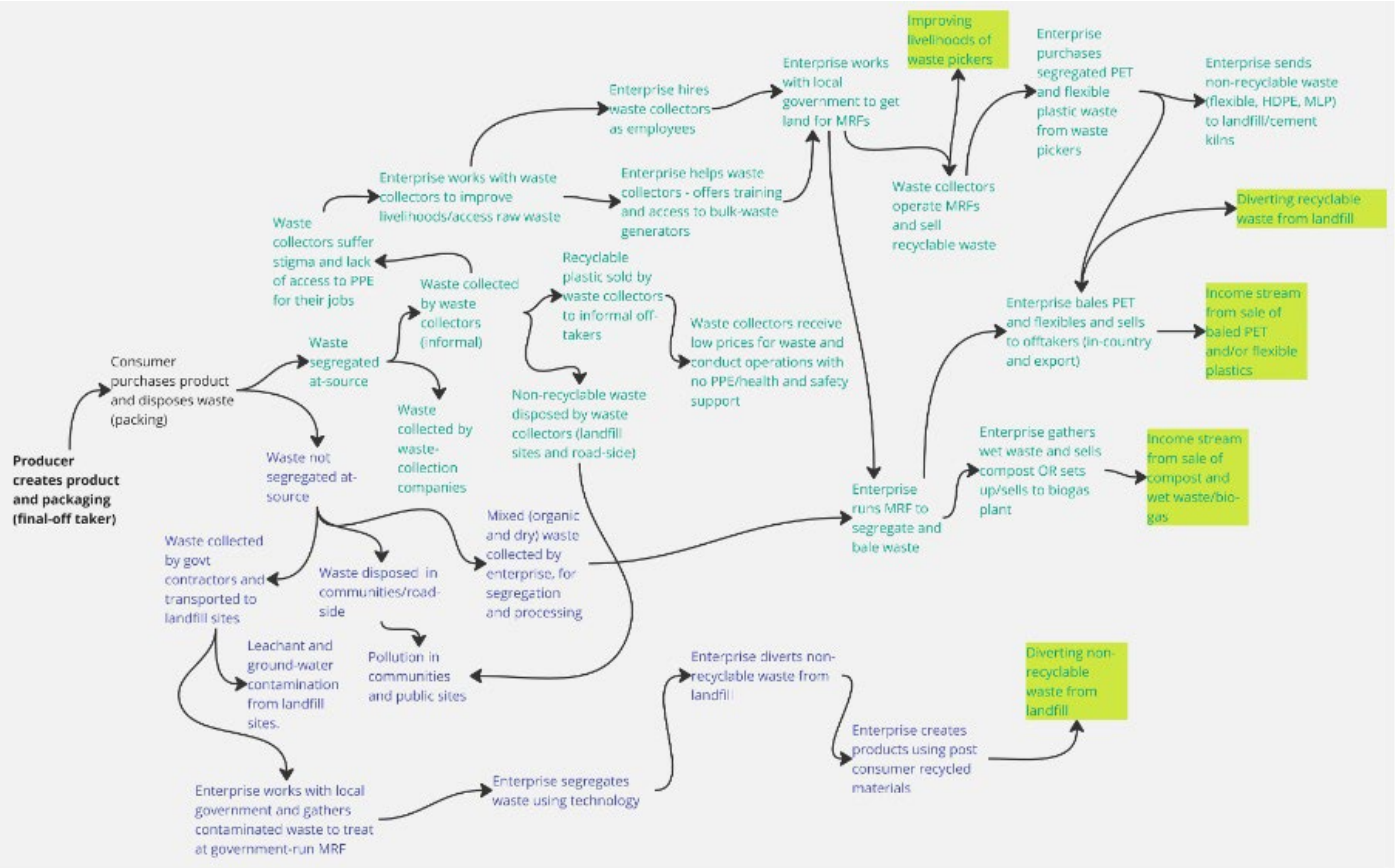


Figure 6: Plastics supply chain

RESULTS DELIVERED BY THE ENTERPRISES

DISRUPTING AND SUCCESSFULLY REIMAGINING THE SUPPLY CHAIN

All enterprises involved in this evaluation had to work within a supply chain that already had established actors, mostly informal in nature, i.e., operating often without formal jobs, licences, or businesses. This is not to suggest that the supply chain worked well or created equal value for all/most actors or created most value from waste. Consequently, all enterprises stated that they had to spend significant time building and maintaining relationships with existing actors such as waste collectors, aggregators, and offtakers, to ensure good quality, consistent supply of waste for their operations. This section explores three key results that enterprises delivered.

HASIRU DALA INNOVATIONS (HDI)

Building trust and challenging how value is apportioned in the value chain

HDI, for example, worked closely with the Hasiru Dala Trust (HDT), a charitable organisation that builds and maintains relationships with waste pickers and their families. Working through HDT, HDI leveraged existing relationships with waste collectors to then disrupt and reinvent the waste collection and segregation supply chain. Nalini Shekar, the co-founder of the HDT, notes how she spent years going into informal settlements in Bengaluru (India), helping women send children to school, getting ID cards (Aadhar cards), and helping them find healthcare. The long process, Nalini argues, built trust with these women where they were willing to test new waste collection models, which includes setting up, working with, and running Material Recovery Facilities (MRFs) (see Story 1: Kumudha's Story).

While HDT was set up and funded outside of the TRANSFORM grant, the work done by HDT, Nalini and Shekar (co-founders of HDT) led to HDI's structure and operations. **By building trust with four waste collector entrepreneurs (both men and women), HDI helped to create a business model that supports the entrepreneurial qualities of the waste collectors. HDI supported waste collector entrepreneurs by negotiating contracts with bulk waste providers (large residential complexes) on behalf of the waste collector entrepreneurs, and helping these entrepreneurs create more employment as small businesses.** In fact, the four individuals that HDI has worked with (Indhumathi, Kumudha, Lothfar, and Shaktiman) all now employ additional people to run MRFs, and officially pay taxes.

HDI used TRANSFORM funding to contribute to its broader efforts to support the entrepreneurial nature of waste collectors. They chose to deliberately follow this model rather than make entrepreneurs employees of HDI, to add greater value to the supply chain, to give agency to the waste collectors and allow them to aspire to something more than a minimum wage job. The social value generated through this model is difficult to quantify; it includes dignity of labour, jobs created, recovery of more waste through a model that can scale and explicating and integrating externalities into the cost of waste recovery.

HDI also disrupted the waste segregation component of the supply chain, working closely with bulk waste providers to establish at-source segregation, to improve the quality of waste collected and reduce contamination of waste, and to divert waste from landfills.

HDI's disruption of the existing supply chain is significant and challenges the very nature of how one might define an 'inclusive' business, i.e., including all stakeholders and creating value for all stakeholders in the supply chain, addressing entrenched power and inequitable value-sharing models.

Story 1
KUMUDHA'S STORY

Kumudha runs the Dry Waste Collection Centre (DWCC) in central Bengaluru. As an immigrant, Kumudha started off as a street waste collector and now employs nine other women to segregate waste, which she then sells to numerous companies, including HDI.

WECYCLERS

Monetising waste segregation and working through franchisees

Wecyclers has disrupted (and reimagined) the waste supply chain in Lagos. Wecyclers has incrementally built its business model, engaging across the supply chain, from waste producer through to the final offtaker (for example, Dow Chemicals, BASF and other similar FMCG companies). Recognising the need for large quantities of good quality waste, Wecyclers chose to incentivise segregation behaviour. By paying for clean, segregated waste, Wecyclers created a system through which they can access good quality, segregated waste while also creating value for waste collectors, households, small shops etc.

This disruption has successfully created more reliable quantities of plastics arriving at the MRFs and better segregation behaviours, to support less waste going to landfill. To meet the volumes that it needs to be financially viable, Wecyclers also successfully tested a franchise model. This franchise model involves Wecyclers providing support to franchisees to secure land for MRFs (franchisees bear the cost of leasing/purchasing land) and providing franchisees with the skills to run a franchise. By 2021, Wecyclers had set up four franchises, developing formal training to help these franchise owners set up their operations and helping set up the MRFs, which often requires significant capital expenditure. Wecyclers then purchases baled plastic from these franchises, creating a more robust and reliable supply chain although the franchisee bears the operating costs. In fact, W4C has also adopted the same model, setting up processing plants closer to the franchises they are setting up, to help gather the volumes that they need for a viable business. In addition, it takes approximately three to six months for a franchise itself to break even since Wecyclers guarantees the purchase of baled plastic.[15] The model is working well enough to attract numerous applicants who are keen to run a franchise (**see Story 2: Last-born – a Wecycler franchisee**)

Story 2
LAST-BORN – A WECYCLER FRANCHISEE

Meet 'Last-born' a franchise owner for Wecyclers. Last-born (nickname) has been running the business for three years. Last-born was a cement seller, worked as a bulk aggregator for Wecyclers before he came to the hub enquiring after the franchise. He had a facility where he would collect and segregate waste but did not have the capital to buy a baler and sell baled waste to Wecyclers. Last-born lives in the area where the MRF is set up. He hires 13 segregators/sorters all of whom are women. He sorts (on average) one to two tonnes of waste a day and can make up to 10 bales of waste a day.

"If you want to scale your business you need to increase collections and create good offtake conditions."

Olawale – COO Wecyclers

WASTE4CHANGE (W4C)

Building trust with aggregators, managing a complex waste management business, and working through franchisees

Waste4Change (W4C) gathers waste from local communities and businesses. Prior to TRANSFORM support, W4C struggled to efficiently operate its business, with staff spending time coordinating and managing logistics. Consequently, W4C staff spent time organising transport (for example) rather than building relationships with informal waste aggregators. They were also unable to devote resources to test other waste collection models, to increase volumes of waste. With the support of the TRANSFORM grant, W4C successfully set up a digital platform to optimise its logistics and gather business data on quality and quantities of waste gathered, segregated, baled, and sold. Now, W4C is able to focus on waste supplier relationships. The digitised data also allows W4C to better analyse its costs and find some balance between the price paid for raw waste and the price they sell their segregated/processed waste to offtakers.

W4C also tested a franchise model (**see Story 3: Disrupting the supply chain: the W4C franchise model**). Since March 2022, W4C is now one of the largest companies collecting waste from informal suppliers.[16]

Another stakeholder in the supply chain that W4C is engaging with is the offtake market. Offtakers have extensive demand and require consistent and reliable supply of good quality baled/processed waste. W4C has started developing relationships with the Indonesian and international markets, engaging more with international markets since the demand in this market is more stable. The price of baled plastic in the international market is correlated to the supply of plastics, i.e., an increase in the supply of plastics in this sector leads to a rise (not a fall) in the price per tonne. This is because there is latent demand in the international market and international offtakers will pay a premium to those suppliers who can provide a consistent supply of good quality waste.[17]

The challenge W4C faces, in engaging with the international market, is cash flow and the payment terms, which is, at minimum, 30 days. This puts cash flow strains on a business that operates with already low margins. However, **W4C is successfully addressing its business challenge of good quality, consistent supply of baled plastic through the franchise model, and is now tackling the challenge of meeting the needs of the offtake market, while still demanding adequate prices for the baled plastic.**

Story 3
DISRUPTING THE SUPPLY CHAIN: THE W4C FRANCHISE MODEL

The W4C franchise model has meant building relationships with numerous franchisees. One franchisee is Kibumi. Kibumi was set up in 2020 and they collect PET, HDPE, PVC, and PPE, with a focus on PET. Their current collection is 200 tonnes a month whereas they are set up to collect and process 400 tonnes/month. Kibumi works with approximately 50 people. In March 2023, Kibumi and W4C agreed to a joint operating model, setting up two warehouses. The goal is to have 600 tonnes of additional collection capacity (high value materials from informal sectors. The cash flow buffer and capex from W4C will help Kibumi scale. The scale means that Kibumi will run a profitable business despite low margins (gross margin: 5-10%).

THE MODEL: The franchise model that W4C designed is a cost/share relationship where W4C provides deposits and operational cash flow. In future W4C will also provide machinery such as forklifts. W4C is also making connections with the export market, creating relationships with offtakers in Malaysia. Apart from increasing processing capacity, Kibumi brings pre-existing relationships with the informal sector. It is hard for new players to enter this market unless they have existing relationships with the informal sector.

CHALLENGE: In October 2022, Kibumi met the production capacity of 400 tonnes. However, the price in the offtake market was low and unless prices increase, they will continue to make a loss in sales.

TAKA TAKA SOLUTIONS (TTS)

Improving the lives of waste collectors, building economies of scale, and moving up the plastics value chain

Taka Taka Solutions' (TTS) model reimagines the supply chain by:

- focusing on the health and safety of waste collectors;
- on increasing volumes of waste to meet the needs of its aggregation centres
- on generating more financial value for its business by moving further up the waste value chain.

To provide context, the Kenyan government devolves waste management to the county. County governments do not charge tax to collect waste, rather, county governments charge individuals/businesses fees for services like tipping and dumping.

In Kyambu county, where TTS operates, the county government only collects waste from commercial establishments. Private companies, like TTS, purchase licences from the county government to manage the waste from residences and businesses. These companies, in turn, charge residences to collect their household waste. In Kyambu there are 150 registered companies that collect and dispose of waste and TTS is the largest of these companies. TTS has set up buy-back centres near dumpsites, to ensure steady access to waste collectors and waste.

By providing personal protective equipment to waste collectors and training them on good quality segregation methods, TTS has created (and reinforced) a component of the plastics supply chain that provides value to waste collectors and builds a steady stream of good quality waste for the TTS aggregation centre. Finally, TTS has also used TRANSFORM funding to produce pellets and flakes from segregated PET plastic, to increase the profit margins for their business.[18]

TRASHCON

Rethinking a circular plastics economy and creating technological solutions to recycle (currently) non-recyclable waste

TrashCon has been a profitable business for many years now and they do not struggle with access to waste, which all the other enterprises in this evaluation had to resolve. To begin with, TrashCon deploys a technological solution, to automate the segregation of contaminated waste.

TrashCon generates value from waste that has already been stripped of valuable plastics like PET and diverts it from landfill. This also means little disruption to the livelihoods of waste collectors through its automated segregation process as the waste it deals with has little value. In addition to automated segregation, TrashCon utilises another technological solution (WoW Recycler™) to create products from (currently) non-recyclable post-consumer recycled material (PCR), generating value from no-value waste.

Finally, TrashCon engages directly with numerous final offtakers, such as IKEA, and large construction companies, to create a market for the product that they create from waste – the WoW Board™. TrashCon does, however, disrupt the plywood and pallet markets. TrashCon's WoW Boards™ compete with the plywood and pallet markets; it is a product that can itself be endlessly recycled, and one that is cheaper than its substitutes (plywood).[19]

TrashCon does, however, disrupt the plywood and pallet markets with its WoW Boards™; It is a product that can itself be endlessly recycled, and one that is cheaper than its substitutes (plywood).[19] affecting the construction industry, furniture industry and other markets where plywood is used. This disruption is starting to yield results, with TrashCon securing large contracts with construction companies and exhibiting high-end furniture using WoW Boards™ in Milan in 2023.

Summary

The context in which enterprises operate (country and city) means that they encounter different sets of challenges in the existing plastics supply chain. All enterprises have successfully disrupted and/or reinforced the supply chains in their contexts. This includes:

1. Creating value for waste collectors.
2. Increasing consistent supplies of plastic waste (PPE, MLP and flexible plastics) to their aggregation centres.
3. Building relationships with final offtakers, for plastics, pellets, flakes or for final products that use post-consumer recyclate (PCR). This also includes securing more stable prices for recyclate or baled plastic.

PROVIDING JOBS AND RELIABLE INCOME: FOCUS ON WOMEN

All enterprises involved in this evaluation created jobs for baling machine operators and for waste sorters, and additional income for waste collectors (**see Story 4: Earning income from waste**). Most waste sorters are paid as contractors, based on kilogram of waste segregated. For example, at the MRF that Wecyclers operates they hire four baler operators and 20-30 female sorters who are paid by kg waste sorted.[20]

Wecyclers

In addition, each of the Wecyclers franchisees employ around two or three bale operators and eight to ten female waste sorters (**see Story 5: Female waste segregator at Wecycler franchise**). Through the seven franchises, Wecyclers indirectly supports approximately 14 jobs for operators and 60 female contract workers.

Story 4
EARNING INCOME FROM WASTE

A long-term waste provider for Wecyclers, whose primary job is to sell homemade liquid soap, has been selling plastic waste to Wecyclers since 2018. Just in the one week this seller made 150,000 Naira. Using the money she made with Wecyclers, this seller sent her last child to high school, bought a small piece of land and built a shop there to continue selling soap. This seller has also told her friends who now make money from selling plastic. She also remarked that the bins are empty with more plastic going back into the packaging supply chain.

Story 5
FEMALE WASTE SEGREGATOR AT WECYCLER FRANCHISE

This waste segregator has been working for three years at the MRF run by a Wecycler franchisee. She has three children and used to sell water before this job. This sorter also brings plastics to the MRF. Whatever she earns from this job she uses to pay for expenses like rent and school fees, which was difficult to pay before this job.

The focus on women is important since, culturally, women in Nigeria don't have many opportunities, with low levels of education serving as a barrier to employment and income generation. Consequently, most women become traders and small shop owners. As women also manage childcare and households, they also need flexible work options. Wecyclers offers flexible work, PPE for segregators, and healthcare options. Wecyclers notes that most women show up regularly to segregate waste despite being given flexibility, i.e., demonstrating that they value their work (see Story 5: Flexible work for female segregators, page 30).

Wecyclers also ensures timely payment, to support their finances. Now, through the franchisee model, Wecyclers is starting to see some women become franchisees rather than waste sorters. Currently three out of the seven franchisees are women.[21] Wecyclers' COO notes that they might prefer to have female franchisees to help balance the skewed access to opportunities between men and women. They report that it is easy for women to be sorters but not franchise owners as women often do not have the education to run businesses, or the confidence to serve in a managerial capacity (see Story 6: A female franchise owner works with Wecyclers).

"Women are the biggest beneficiaries (of Wecyclers) because they support families and help to pay school fees from the money they earn."

Olawale – COO Wecyclers

Story 6
A FEMALE FRANCHISE OWNER WORKS WITH WECYCLERS

This female franchise owner has been running her business since 2019. Wecyclers provided balers and a generator to run and scale her operations. She engages 20 people in her MRF, to segregate waste, run the balers, and transport waste. She sorts two to three tonnes of PET daily and makes five to six bales daily as well. The MRF has the capacity to sort five tonnes a day. This franchise owner previously bought and sold PET and decided to then work as a Wecyclers franchise. She purchased PET from street collectors, then rented a truck and drove the waste to an aggregator. She hopes to expand her business and increase volumes.

HDI

HDI provides 25 jobs for women at their MRF at Aurangabad (TRANSFORM funding supports this MRF) and jobs for six baler operators. Prior to TRANSFORM funding, HDI also helped numerous women set up and run Dry Waste Collection Centres (DWCCs), which have since grown and generated employment for more women (see Story 1: Kumudha's story, page 24).

HDI purchases waste from the DWCCs run by women, scaling its business, contributing to the income and livelihoods for the women managers and the women who segregate waste at the DWCCs. TRANSFORM funding has not supported the DWCCs directly. However, the funding has helped HDI purchase more waste from these female entrepreneurs, therefore tangentially benefiting the livelihoods of the women managers and women waste segregators.

TrashCon

TrashCon does not support the waste picking community, rather, they create 'new' jobs for TrashBot™ operators. For every TrashBot™ that runs at capacity, TrashCon creates four new jobs through the creation of WoW Boards™.

Taka Taka Solutions

Taka Taka Solutions (TTS) has contributed to creating 114 indirect jobs in the factories that purchase baled waste from TTS. Of the 114 jobs, 56 jobs were filled by women. We also spoke to ten waste collectors engaging directly with TTS. Of the ten, five were women. The average monthly income of these waste collectors is KES 24,450 (GBP 130) and on average each waste collector supported four individuals in their household with all but one waste collector serving as the single earner in the household.[22] Many of these waste collectors have worked with TTS for close to two years, demonstrating the likelihood that these relationships will continue.

Summary

All enterprises have certainly created value both directly and indirectly to lower income, often unskilled individuals (see Table 2 below: Job creation and supporting livelihoods, below). There are many enterprises where women benefit more directly since waste picking and segregation is a profession that can be undertaken to better suit a woman's other, traditional tasks.

Enterprise name	Formal jobs TRANSFORM has contributed to	Contract work that TRANSFORM has contributed to	Women with jobs/ contract work that TRANSFORM has contributed to
Wecyclers	18	90	90
Hasiru Dala Innovations	31	18	43
TrashCon	8	N/A	N/A
Taka Taka Solutions	114	855	56+

Table 2: Job creation and supporting livelihoods

DIVERTING WASTE FROM LANDFILL

In Lagos, only 40% of waste gets collected and only 13% is recycled. The rest is dumped in formal and informal landfills and/or dumped outside homes. Households need to pay the government to collect waste and there are only three operating landfills all of which are full. This is a problem for Lagos.

In the past 18 months, Wecyclers has been able to grow sales exponentially. This is partly because Wecyclers has grown to the point where it supplies significant amounts of waste to the local offtake market. This has helped Wecyclers negotiate prices rather than being forced to accept prices set by the offtake market. Wecyclers has also expanded to an export market and now sells 45 to 60 tonnes of baled plastic every month to Europe. This has made Wecyclers competitive and able to negotiate prices in the local market.[23] To contextualise the scale, from 2018 to May 2023 Wecyclers has collected 11,402,973.8 kg of waste, from which they have generated revenues of N434,487,878 (GBP 470,000) and paid N86,283,734 (GBP 93,400) to waste collectors.

In just six months, between October 2021 and March 2022, W4C has diverted 574,937 kg of plastic waste (recyclable and unrecyclable) from landfill. Over 2022 W4C processed over 8,000 tonnes of plastic waste for the year. On the other hand in the Aurangabad MRF (funded by TRANSFORM) HDI has collected 441,203 kg of PET and segregated 175,268 kg of waste for the first six months of 2022.[24] In just two and a half years, TrashCon has processed (and therefore diverted) 1,100 tonnes per day. The aspiration is 25,000 tonnes per day.[25] Taka Taka Solutions was segregating 316,000 kg of recyclable waste between January and March 2022 and is now segregating 811,000 kg of waste in the quarter April-June 2023.

These figures above all indicate the scale at which each of these enterprises is operating, with historical data on how much waste has been diverted, to date, and some indication of the growth trajectory (for enterprises like TrashCon and Wecyclers, that are at a different stage in their scale pathways).

IMPACT PATHWAYS

HOW ENTERPRISES HAVE DELIVERED RESULTS

This section explores the activities and business models that enterprises have deployed and/or tested to deliver the results discussed in the Results section above.

WE EXPLORE SIX PATHWAYS TO IMPACTS:

1. The franchise model

Helping access waste for the business.

Wecyclers (Nigeria) and W4C (Indonesia) both tested the franchise model to meet their raw waste needs. Both enterprises provided capital (to purchase baling machines) and technical knowledge to their franchisees through which the enterprises found a pathway to access greater volumes of waste. Most small waste segregation and processing companies do not have the capital to purchase machinery so capital injection and technical support catalyses these smaller businesses.[26] The franchise model also helps build trust with informal aggregators, who have access to bulk waste but are often reticent to work with new entrants. The franchise model also helps to scale the waste solution to other parts of the respective countries, which is necessary when dealing with the scale of the waste generated, leading to positive environmental and health benefits.[27]

2. Working with waste collectors and waste collector entrepreneurs

Helping access waste for the business and creating employment.

HDI and TTS both work downstream in the supply chain. Working with waste collectors and treating them as entrepreneurs tackles inequities in the supply chain by shifting value generation from the upstream, larger businesses to those of the waste collectors. For example, by treating waste collectors as entrepreneurs, HDI purchases segregated waste at a market/above market rate. If treated as salaried employees, enterprises like HDI have an opportunity to increase their revenues and profits rather than transferring the revenue generation to the waste collectors. In addition, enterprises like HDI and TTS include the cost externalities like health and safety, in their pricing models, which is traditionally not factored into the cost of waste recycled. By building trust with waste collectors enterprises have tapped into a consistent source of good quality waste. Many waste collectors choose to sell waste to these enterprises over other companies because of the benefits they receive (PPE, consistent demand, and fair prices). This model also supports job creation and better livelihoods as the waste collectors will often hire more waste segregators and workers, they will purchase equipment, save income, send children for higher education and so forth.

3. Incentivising segregation behaviours and income stream from waste collection

Better quality waste for enterprises and additional revenue streams for segregators.

Contaminated waste is a key reason why waste goes to landfill. Contaminated waste is also partly responsible for leachate that seeps into groundwater from landfill sites.[28] At-source segregation is key to divert waste from landfill sites, recover recyclable waste, find solutions for non-recyclable waste, and help enterprises access consistent quantities of good quality waste from waste producers. Waste producers need to shift their segregation behaviours, to minimise waste contamination. This means separating dry and wet waste at source. HDI, TTS, and Wecyclers all delivered awareness campaigns and training for waste collectors, to promote better segregation at source. While enterprises like Wecyclers pay individuals to deliver segregated waste, HDI charges to collect segregated waste, and TTS and HDI pay waste collectors for uncontaminated waste. While the revenue models vary, all the enterprises educate waste producers and waste collectors to segregate waste; creating lower input costs, diverting more waste from landfill, and creating income for the enterprise and households and/or waste collectors.

4. Technological innovations

Recycling (currently) unrecyclable waste, and creating business efficiencies.

TrashCon, Wecyclers, W4C, and TTS all tested and used technology to support efficiencies and create new revenue and product lines. TrashCon stands out as an enterprise with the technological capacity to process and segregate contaminated waste while also recycling traditionally non-recyclable waste (multilayer plastics). In creating new products from non-recyclable waste, TrashCon has created both an additional income stream and diverted waste from landfill. The longer-term ancillary benefits include reduction of trees cut down to meet the needs of the construction industry.[29] TrashCon is also testing cloud based software to build an additional income stream, which is the sale of the TrashBot™ and the WoW Recycler™. By using cloud-based software, TrashCon aims to provide remote technical and maintenance support to its clients, while also gathering data to improve the quality of its machines. Wecyclers, W4C and TTS also use apps and platforms to facilitate logistics and to better connect waste producers and the enterprise. Enterprises note that the platforms (W4C and Wecyclers) have created efficiencies, which, in a margin-poor industry, can significantly benefit business income and profits.

5. Collaborating with government

Access to land and influencing regulation.

The government is a key player in the plastics supply chain. As plastics recycling businesses need space to set up Material Recovery Facilities (MRFs), and land is expensive and often in short supply, all enterprises have built relationships with governments.[30] In Kenya, for example, TTS has had to obtain a licence from the county government to run a buy-back centre where they purchase waste from waste collectors. HDI, TrashCon, and Wecyclers have all been given land by the government to set up and run MRFs and recycling centres. For TrashCon, the municipal government of Bomasandra also funded a biogas plant to process organic waste. W4C has, in fact, lobbied the Indonesian government and the Founder of W4C is seen as a waste-ally to the Indonesian government.

6. Creating multiple income streams

Building a sustainable business model

Most enterprises recycle PET. However, the PET market is vibrant and highly competitive as the value chain is relatively well established and PET is seen as a form of valuable waste. The HDPE, LDPE, and MLP markets are less well established. Early market entrants (for flexible plastics or MLP) like HDI contend with greater risks but also potentially reap greater rewards. HDI recognises that the PET market has low margins because of the saturated collection and processing market. However, there are opportunities in the LDPE and HDPE markets, which HDI has started supplying to.[31] Wecyclers processes organic waste, cardboard, glass, PET, and is soon expanding into Styrofoam. W4C also segregates and sells a variety of waste – cardboard, PET, and glass.

Given the results that enterprises have delivered and the delivery models and impact pathways that they have used, we can distil insights for other enterprises that work in the plastics supply chain. The next section lays out these insights.

INSIGHTS FOR OTHER ENTERPRISES

In this section we lay out seven insights that enterprises might consider when attempting to run successful social enterprises in the plastics economy.

WHAT WE ARE LEARNING ABOUT RUNNING A SUCCESSFUL SOCIAL ENTERPRISE IN THE PLASTICS ECONOMY

INSIGHT 1

Enterprises need adequate and reliable supply of waste (mostly PET) to sustain operations. With low margins, uncertain and volatile prices from offtakers, and the lack of control that enterprises often have over input prices, enterprises have to rely on volumes and economies of scale to sustain a business in this sector. From forging alliances with waste collectors, to creating franchise models, enterprises have developed numerous models to deliver these volumes. Also, enterprises that have created franchise models and access larger quantities of waste, often have more liquidity to offset the volatility in the offtake prices and can therefore wait for favourable market prices.

INSIGHT 2

Enterprises are reliant on prices set by offtakers. Many businesses are testing the use of social enterprises to address environmental and social challenges. The Melitta group and Cofresco, for example, set up Fair Recycled Plastics, a social enterprise that recycles flexible plastics to create pellets/flakes, which are used to create garbage bags. HDI supplies flexible plastics to Fair Recycled Plastics and is paid above market prices for waste. This model is an exception to the norm but may be more popular as other companies look for solutions to plastics and waste. As most enterprises are reliant on the prices set by the offtake market, enterprises often struggle with margins. In India, for example, the PET offtake market, which operates as an oligopoly, determines the bale price for PET. This price is volatile and significantly affects the enterprise's margins.

INSIGHT 3

Enterprises recoup greater financial value if they move higher up the plastics value chain. Margins improve for enterprises that choose to go higher up the value chain, for example, creating flakes, pellets or products that are designed for end users, margins improve. However, when producing end products, enterprises should consider how to influence final offtakers like FMCG companies or industries like construction and furniture. TrashCon, for example, has had to build relationships with construction companies, to convince builders to test their products. However, to move higher up in the value chain, enterprises need significant capital investment and technical knowledge, which are both barriers to entry.

INSIGHT 4

It is prudent to diversify income streams and widen waste supplier networks and offtake clients. Most enterprises recycle PET. However, the PET market is vibrant and highly competitive as the value chain is relatively well established and PET is already seen as valuable waste. The HDPE, LDPE, and MLP markets are less well established. Early market entrants have to contend with greater risks but also potentially reap greater rewards. Hasiru Dala Innovations, for example, recognises that PET has particularly low margins because of the saturated collection and processing market. However, there may be opportunities in LDPE and HDPE, which they are exploring. Wecyclers processes organic waste, cardboard, glass, PET, and is soon expanding into Styrofoam. Waste4Change also segregates and sells a variety of waste – cardboard, PET, and glass.

INSIGHT 5

Technology can create efficiencies in a margin-poor industry. All enterprises that tested technical solutions increased their efficiency. This includes the use of cloud software, tech platforms to create more efficient logistics, and apps to help connect waste producers to enterprises. W4C employees, for example, determine that the new platform has helped reduce time spent on data quality control, which has allowed them to focus more on client-facing work.

INSIGHT 6

It is necessary to build trust with the existing, informal waste management sector. The informal waste sector is largely wary of outsiders and new market entrants. The enterprises involved in this evaluation have had to work with waste collectors and aggregators, to build and sustain trust. Enterprises like HDI have created charitable organisations to support waste collectors, and created social safety nets that demonstrate their willingness to build long-term business relationships with these stakeholders.

INSIGHT 7

Enterprises may need to incentivise/educate at-source segregation. Shifting behaviours is hard at the best of times. It is even harder to ask waste producers to pay attention to their waste and segregate at-source because waste producers are not accustomed to thinking about waste and there is no incentive to segregate waste. Wecyclers pays for segregated waste while other enterprises run education and awareness campaigns. All enterprises (except TrashCon) focused on waste segregation, but it remains a challenge for many.

These seven insights are not exhaustive, but they do reflect collective wisdom from the enterprises involved in the evaluation, most of who raised all seven insights (where relevant). The following section lays out insights from enterprises, for donors and investors operating in the plastics supply chain.

RECOMMENDATIONS FOR DONORS AND INVESTORS

This section covers six recommendations from the evaluation process, which are useful for donors and investors operating in the plastics industry to consider, in the funding and technical support that they provide to enterprises in the plastics supply chain.

WHAT WE ARE LEARNING ABOUT SUPPORTING A SUCCESSFUL SOCIAL ENTERPRISE IN THE PLASTICS ECONOMY

RECOMMENDATION 1

Encourage enterprises to create value across the supply chain, where possible. Social enterprises deliver both financial and social/environmental value. While value generation is important, it is equally important to consider who benefits from this value, i.e., reimagining a more inclusive supply chain. Inclusivity looks different for different enterprises and **donors and investors would benefit from supporting enterprises to explore inclusivity and value generation more explicitly in their business models.** For HDI, for example, inclusivity is a profit sharing model. For Wecyclers, inclusivity is creating income streams for individuals and for franchisees (job creation and incomes). For W4C, inclusivity means scaling the business through franchises to address the problem that is waste, while also creating productive value in the waste ecosystem. For TTS, inclusivity is creating better and safer working environments for waste collectors.

RECOMMENDATION 2

Support enterprises to map their value chain, from waste production through to the final offtaker. An enterprise may assume that their business will succeed by addressing supply and demand for plastics. However, enterprises that work in the plastics economy must often contend with volatile offtake prices, oligopolistic markets, and slow moving and risk averse final offtakers (large companies). **Consider supporting enterprises to map out downstream and upstream stakeholders in the supply chain to explicate other dependencies and, therefore, risks and opportunities.**

RECOMMENDATION 3

Support enterprise compliance with evolving regulatory frameworks. Government regulations are central to waste management. The national government is primarily responsible for waste collection and disposal and the regulatory framework that governments establish could influence how waste is managed. Another set of key stakeholders in the waste ecosystem are producers of packaged goods, such as FMCG companies and other large multinationals. As extended producer responsibility (EPR) laws and frameworks are formalised or implemented, these policies will influence the operational models of many of these social enterprises. It is important for **donors and investors to help enterprises consider how they respond to and/or influence the regulatory framework (like W4C does, in Indonesia), and how to work with large companies to purchase and test their recycled products (TrashCon, for example).**

RECOMMENDATION 4

Invest in social enterprises at the right time using the appropriate financing model. Most enterprises that we spoke with noted the difficulties they face in scaling or increasing profit margins by moving up the supply chain. This is because donors rarely provide funds for capital expenditure (although TRANSFORM did fund some baling machines for enterprises) and investors often do not have the patience to wait for a business to properly scale, i.e., deliver its social and financial impacts. Wecyclers, for example, said that they should have looked for funds earlier in their journey, to scale more quickly.

The nature and timing of investment are both crucial. For example, TrashCon credits TRANSFORM with the funding to help them scale and thrive at a point when they wanted to increase the volumes of waste processed (from two to ten tonnes per day) but did not have funds to refine their technology. TRANSFORM also funded HDI's expansion in Aurangabad, helping HDI test how it might scale its operations. Finally, W4C credits TRANSFORM funding with supporting efficiencies through the platform that they developed. The nature of expenditure varies depending on the maturity of the enterprise, and timing of funding (grant vs. concessionary debt vs. loans vs. development impact bonds) is crucial.

Donors and investors might consider what type of investment (grant, debt, equity, impact bonds and so forth) is going to trigger growth and scale. Donors and investors might also consider at what point the investment is most likely to deliver growth, for example, grant funding (rather than impact bonds) when creating or refining a tech solution that will improve efficiencies or create a new revenue stream. Impact bonds may be more viable when the business model is reasonably well tested, but the enterprise needs capital to scale its operations (like the Wecyclers franchise model, for

example).

RECOMMENDATION 5

Encourage enterprises to operate higher up the recycling chain, creating recyclate rather than just segregating waste) and by diversifying their waste portfolios. While most businesses will consider both economies of scale and efficiencies, to sustain and grow their businesses, enterprises in the plastics industry will survive only if they operate with economies of scale. Margins in the plastics business are small, especially when dealing in PET. This also means that enterprises in the plastics supply chain may also consider de-risking by diversifying their waste portfolios to include other forms of plastics and/or waste (cardboard, glass and so forth). **Donors and investors could consider incentivising (funding, for example) enterprises to diversify waste portfolios and generate adequate volumes of good quality plastic to operate with economies of scale.**

RECOMMENDATION 6

Do not discount vested interests and lack of trust within the ecosystem. The waste ecosystem is traditionally run by the informal sector – waste collectors, aggregators, and offtakers. These actors are not likely to trust outsiders and enterprises that operate in the plastics supply chain have to work constructively with these actors to survive and/or thrive. Enterprises like HDI leverage the trust established by charitable organisations that have historical relationships with some/all of these actors. Taka Taka Solutions provides safety equipment and training to waste collectors, to forge and maintain trust. **Donors and investors could support enterprises to work in partnership with charities that hold trusting relationships with waste collectors (for example) or find alternative engagement strategies to work effectively with waste collectors and aggregators.**

These six recommendations, we hope, will help donors and investors better support social enterprises in the plastics supply chain, while simultaneously de-risking investments and funding so that enterprises have a stronger business model and likelihood of survival and success.

CONCLUSIONS

When evaluating the impacts of a social enterprise it is difficult to create discrete boundaries between the social and environmental impacts and the viability of the business itself. The relevance and sustainability of the results are based on the robustness of the business model.

EVALUATING THE IMPACTS

This evaluation has attempted to discuss results and explore insights on how to run a successful social enterprise in the plastics industry.

We see this as a salient approach for the evaluation because the social enterprise model in this plastics industry is a relatively new concept and there is value in demonstrating both results and how/why enterprises were able to deliver these results. To that end, it is interesting to note that all enterprises involved in this evaluation chose to focus on different components of the waste supply chain, for example, working with waste collectors, offtakers, and working further up the value chain. Some enterprises (like HDI) chose to focus largely on the livelihoods of waste collectors, while creating a viable business, while others like TrashCon focused explicitly on the problem of waste.

This clearly demonstrates that no one business model can serve as a template for a social enterprise in the plastics supply chain. All five enterprises we engaged with have encountered challenges and despite the challenges, these enterprises have delivered some real benefits for waste collectors (especially women waste collectors), for the environment and health and wellbeing of communities in which they operate, and as litmus tests for other enterprises to consider how to solve the problem of waste.

We conclude this evaluation by highlighting the key results that emerged from the evaluation process, along with the challenges that these enterprises faced. See following page for results.

HIGHLIGHTING THE KEY RESULTS

Demonstrating that it is possible to create viable social enterprises in this supply chain

The five enterprises all noted challenges they faced in running businesses while delivering positive results. The insights that these enterprises offer demonstrates pathways for other enterprises to consider entering the market and finding waste solutions. We see success stories like that of TrashCon, which is now a profitable business, and Wecyclers that have received outcomes-based financing from Societe Generale, Bridges Outcomes Partnership investment and Unilever. We also see W4C expanding its franchise model, with a visible pathway to profitability. TTS is moving higher up in thevalue chain, producing pellets and flakes. HDI is also looking to move higher up in the value chain and expand its portfolio of waste to recycle HDPE.

Benefits for waste collector: providing jobs and reliable income

For enterprises that worked directly with waste collectors like HDI and TTS, waste collectors saw both a rise in income and improvements in working conditions as well as the perception of their own work and dignity. The waste collector contractor model used by TTS certainly leads to the benefits noted above. The entrepreneurial model that HDI uses focuses on profit sharing, to strengthen the entrepreneurial model that waste collectors themselves have traditionally employed. This entrepreneurial model also supports job creation, as waste collectors build their businesses and hire more segregators, collectors, and truck drivers (for example).

Benefits for the environment and communities: diverting waste from landfill

We note improvements in waste management, leading to cleaner environments and waste diverted from landfill. As enterprises segregate greater volumes of waste, we see more waste diverted from landfill. TrashCon, for example, has helped a municipality outside of Bengaluru (India) become zero waste. Many waste collectors in Lagos also anecdotally noted that dustbins were less full, and streets were now cleaner, creating healthier living conditions for people. As enterprises like TTS and HDI charge bulk waste providers to responsibly remove waste, we not only see cleaner living environments, but more waste diverted from landfill as well.

Challenges facing enterprises that choose to work in the waste supply chain

The enterprises all note similar challenges to working in the plastics supply chain. These include:

- Establishing adequate, good quality, reliable supplies of plastic waste to sustain operations, which often includes incentivising at-source segregation.
- Price volatility of baled waste, often set up an oligopolistic offtake market.
- Small margins, which necessitates the need for greater efficiencies and economies of scale, which might include leveraging technology or diversifying waste portfolios.
- The need to build trust with the existing, informal waste management sector, to help maintain adequate volumes of waste and generate value for all stakeholders in the supply chain.

Conclusion

The TRANSFORM programme's contribution has catalysed environmental, social, and business results. The enterprises that TRANSFORM supported have delivered meaningful results although they all note the need for more funding or technical/business support to either sustain or scale their respective businesses. The social enterprise model for the plastics supply chain is indeed a viable model and has the potential to deliver meaningful results at scale, assuming adequate and timely funding and technical support.

APPENDICES

Appendix 1: Questions this evaluation set out to answer

Appendix 2: References

APPENDIX 1: QUESTIONS THIS EVALUATION SET OUT TO ANSWER

What impacts do TRANSFORM-funded enterprises intend to have on the value chain they operate within?

- Why have the enterprises chosen to influence the specific link in the value chain that they operate within?
- What types of solutions/technologies do these enterprises believe will work to resolve the challenge they hope to address? What do they hope to reinforce/disrupt?
- What assumptions are the enterprises making that their models will lead to change and where are the gaps in the logic?
  - The need for adequate and reliable supply of plastic waste (mostly PET) to sustain operations.
  - Reliable and predictable cost of raw materials and baled waste.
  - Waste producers are willing to segregate at source.
  - Enterprises can create a market for recycled waste products (WoW Boards™, for example).
  - Offtakers are willing to pay for the cost to support waste collectors.
  - The existing, informal waste management sector is willing to trust new market entrants.
- Are there innovation gaps that enterprises will both address as well, areas where they will be gaps, within the circular economy 'system'?

What impacts have these enterprises had on the circular economy?

- Have these impacts emerged as expected or do we see unintended consequences?
- What have we learnt about how to influence the circular economy value chain?

How have these enterprises contributed to these results?

Are there other potential pathways to achieve the same results/impacts?

What aspects of the supply/value chain have been most robust and difficult to shift?

How have these enterprises responded to challenges they have faced on their implementation pathways?

APPENDIX 2: REFERENCES

1. Interviews with Dr Femi Idowu – Adegoke (President, Lagos Recyclers Association), Olawale Adebiyi (CEO, Wecyclers), and Yemisi Ayansola (COO, Wecyclers). p5
2. Caveat: not all the waste collected is recycled and processed. p5
3. TRANSFORM contributed to these results by paying to develop a logistics platform that has helped Waste4Change become more efficient. p5
4. This facility caught fire in 2022, which was a major setback for HDI.
5. Interview with CEO of TrashCon (May 2023). TRANSFORM funding helped TrashCon scale its operations from two to 10 tonnes of waste per day. p5
6. Divert, HDI, Oxfam Social Factory, Taka Taka Solutions, Taka Taka Ni Mali, TrashCon, Wild Enterprise, Mr Green Africa, Wecyclers, Saltech design labs, Recity, Refillable, Ashaya Recyclers private limited, Alner, Bopinc, Gripe, and Baeru. p8
7. See: https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview, accessed October 2023. p8
8. To establish circularity we need to be clear about how (in what products) the recyclates are being used, what percentage of the waste recycled/recyclate is indeed feeding back into the production and consumption ecosystem, and whether Post Consumer Recyclate (PCR) is being used to create a product that can itself be recycled without going to landfill and affecting biodiversity/nature. p9
9. Traschon Project proposal for TRANSFORM (2020). p17
10. TRANSFORM grant value: GBP 212,400 p17
11. TRANSFORM grant value: GBP 287432.6 p18
12. https://www.wecyclers.com/about/ p19
13. TRANSFORM grant value: GBP 311,578.01 p19
14. TRANSFORM grant value: GBP 308,950 p20
15. Interview with Samsung, Franchise manager at Wecyclers (April 2023). p25
16. Interview with Yoan, W4C (March 2023). p26
17. Interview with Kibumi (March 2023). p26
18. TRANSFORM funding was used to partly fund machines to create flakes and pellets. p27
19. Interview with TrashCon team and TrashCon co-founder (Nivedha RM), March 2023. p28
20. On average, each woman sorts 160 kg per day. p30
21. Interview with Olawale, COO Wecyclers (May 2023). p31
22. TTS contributes significantly to these incomes as six of the ten collectors sell only to TTS. p32
23. The export payment cycle is longer so Wecyclers now contends with a different challenge. p33
24. This facility caught fire in 2022, which was a major setback for HDI. p33
25. Interview with CEO of TrashCon (May 2023) p33
26. This model also helps add value to the entire supply chain by facilitating job creation. p35
27. Waste4Change, for example, works with franchisees in Bali and other parts of West Java, to deal with the ubiquitous waste challenge. p35
28. See: https://www.sciencedirect.com/science/article/abs/pii/S0959652621043997 for detail on leachate. p35
29. TrashCon's product has the potential to replace plywood and pallets. p36
30. In Lagos, land is valued at a premium and very hard to set aside for recycling activities. p36
31. HDI now supplies milk packets (flexible plastics) to a recycling company called Vishuddh Recycling, creating an additional income stream. p36

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We combine grant funding, business insight, practical experience, resources and networks. Our tailored approach creates evidence which we share widely to help leaders across the world solve global challenges.

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