Vital lessons from pioneering organisations on the frontline of waste and ocean plastic

Joi Danielson supported by contributing authors Julia Luchesi (Brazil), Camila Echeverria (Chile), Pinky Chandran and Nalini Shekar (India) and Zulfikar (Indonesia)
This book has been an act of love. It was completed on the sidelines of building and running frontline waste programs at Hasiru Dala, TriCiclos and Project STOP. It’s the report we wish had existed when we were starting our organisations. It includes what we’ve learned in our own endeavours, and what has worked for over 45 successful frontline organisations interviewed in four focal countries—Indonesia, India, Brazil, and Chile.

So often these kinds of reports—including my own past research —take a top-down, "what must be true" modelling approach to solving waste management and ocean plastic problems. But this report is bottom-up. We went into the world and asked those that had been successful on the frontlines how they did it. We hope that making the effort to cross the language barrier between English, Portuguese, Spanish, and Bahasa Indonesia will bring new insights into how sister organisations have solved the most important and common waste management challenges and inspire new collaborations between organisations.

Waste is collected on the frontlines. It can only be stopped from going into the ocean on the frontlines. While global leaders gather at international forums to talk about the crisis of ocean plastic, local leaders on the ground are rolling up their sleeves and getting things done. These are the heroes of waste management. Yet, their task is more difficult than it needs to be. In each country, they need to work around different but significant constraints in the waste system that can only be addressed at a policy level outside their control. They struggle to make the economics of waste management work due to the very low margins of recycling and minimal, if any, government or private sector support. They hear about the hundreds of millions of dollars earmarked for ocean plastic and waste solutions yet struggle to access these funds because they’re too small, too informal, or don’t communicate in a way that international donors need to feel comfortable. There needs to be a better way.

Waste has always been someone else’s problem. The very nature of throwing waste “away”, out of sight, out of mind, transfers the responsibility to someone else. Some blame the government for not investing enough into waste management or for poor legislation. Some blame resin producers and consumer goods companies for flooding the market with plastic products (much of which is hard if not impossible to recycle economically). Some blame everyday people for burning garbage or dumping waste directly into the environment when they should know better (yet do not have access to functional waste collection services). When we blame, we transfer the problems to others. But what’s needed is the sharing of responsibility across the entire manufacturing-to-waste value chain—by every stakeholder — especially to empower frontline organisations to do their job and scale their impact. This is how true change will happen.

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Disclaimer

This report has been written by a team from Vital Ocean, HasiruDala and TriCiclos, which take full responsibility for the report’s contents and conclusions. More than forty-five organisations were interviewed for this report. While they have provided significant input into the report’s development, their participation does not necessarily imply endorsement of all the report’s contents or conclusions.

INTERVIEWED ORGANISATIONS

We thank the many organisations who gave us a glimpse into why their organisations have been so successful. This work is a celebration of all that they have achieved.

BRAZIL

CICLO ORGÂNICO
- Vinicius Caldas Barbosa
- Lucas Chiabi

COOPERCAPS
- Telênes Basilio (Carioca)

COOPERPAPPE
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- Zaqueo Vieira

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- Everton Serpa da Silva

GIRAL
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LIGHT RECICLA
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- Carlos Henrique Nicolau

PIMP MY CARROÇA
- Carol Pires
- Letícia Tavares

PROJETO RELIX
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- Lina Rosa

RECICLO
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- Andrea Livramento
- Fernando Campos

TRICICLOS
- Daniela Lerario
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- Nílto José Lima da Silva
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SWACHHA ECO SOLUTIONS
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- Rajesh Babu
- Raghavan Vinay

VRECYLE WASTE MANAGEMENT SERVICES
- Clíntan Vaz

INDONESIA

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- Titi Martini Tapran
- Herman Sukmana

ECOBALI RECYCLING
- Paulina Cannucciari

RUMAH KOMPÓS
- Paulina Cannucciari

PANANGKAN ISLAND
- Maharia

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- Nur Anik

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- David Kuper

WASTE4CHANGE
- Chairul Ruskandi
- Muhammad Andriansyah

YAKSA PELESTARI BUMI BERKELANJUTAN (YPBB)
- Melly

ROBBIES
- Syukratun N’aimah

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Executive Summary

The world is struggling to answer the question, “How do we stop ocean plastic pollution quickly, permanently, and as cost efficiently as possible?” This paper attempts to provide answers, focusing on waste management strategies in the developing world that will curtail leakage of plastics into the planet’s waterways. Ultimately, reduction will result from solving the complex root causes that cause waste to be mismanaged—something deeply interwoven with economic, technical, social, and behavioural norms. Solutions need to be culturally appropriate, inclusive, economically sustainable, technically rigorous, and built on a foundation of transparent, reliable governance—which takes time to develop. Yet, we are in an environmental crisis and need to move forward—and scale quickly while not ignoring the fundamental building blocks required for systemic change.

Waste management is an integrated system. If only one part of the value chain is addressed, then remaining constraints create bottlenecks in other parts of the chain. Many committed and capable organisations have made only incremental progress in reducing ocean plastic because they focus on only a single aspect of the waste system. But when constraints throughout the waste system are resolved simultaneously and the economics can be solved, long-term marine debris reduction is possible. Cleaner, healthier, and more modern cities—including the creation of thousands of green jobs—are also achievable. Few waste organisations have managed to do this successfully—and fewer still at scale. We wanted to learn from those that had.

This report includes a chapter on how to solve each of these five universal waste management challenges. Case studies are used to illustrate how different organisations have tackled these issues in different environments. The conclusion includes recommendations to government and the private sector that come from the frontline of waste management. If implemented, these recommendations would remove systematic challenges that are faced by all organisations and materially improve waste systems country ride. The appendix includes short descriptive profiles and business canvases of the report’s most prominently featured organisations so others can learn different waste business model designs.

This process took us to four nations in the world that are arguably leaders in solving these common, yet significant, challenges: India, Indonesia, Brazil, and Chile. Leaders of more than 45 best-practice organisations were interviewed. A range of languages, belief systems, and geographic realities separate the organisations featured in this report, but their stories and business models are broadly applicable to any waste funding-constrained area of the world. We hope that the effort to cross the language barriers of English, Portuguese, Spanish, and Bahasa Indonesia will bring shared recognition across the world that are arguably leaders in solving these universally difficult, but solvable, challenges.

KEY FINDINGS

1. Behaviour change at scale

Waste management literature is littered with failed behaviour change case studies. So much so that the general consensus is that models which rely on community behaviour change—like waste separation at source—will fail. It is assumed that it is just too difficult to get people to care enough to sort their waste. But the focal organisations have shown that behaviour change is not only possible, but also does not require years to accomplish. This chapter outlines the tools, tactics, and campaigns that organisations have used to transform how their communities think about—and take responsibility for—their waste practices.

- Behaviour change is as much a science as it is an art. With distinct steps, behaviour change can be broken down, learned, and applied by anyone for consistent results to address a broad range of waste and ocean plastic actions that need not take years.
- If we want to change behaviour, we must first understand the belief systems that guide it and then develop alternative belief structures.
- To get behaviour change to “stick,” communicating “why” change is necessary is crucial. Reasoning has to be clearly shared and change made structurally easy, with both positive and negative incentives that organically reinforce the transformation over the long-term.
- To build a new habit, introduce “triggers” like a sound or smell that precedes an activity and a “reward” for completing that activity (cue -> routine [habit] -> reward). Each time the brain encounters the trigger, it knows what activity should come next [with a reward to follow].
- Eight influencing strategies have been found to be particularly potent in changing community behaviour. They are (1) inspiration/appeal to values, (2) logic, (3) role modeling, (4) relationships, (5) authority, (6) consulting, (7) social pressure, and (8) community pride.
- Campaigns combine overlapping and mutually supportive behaviour change strategies and communication elements to inspire and train communities.

2. Waste picker inclusion

This chapter delves into understanding waste pickers—who they are, and why they need to be protected, and the strategies that organisations have successfully used to earn their trust, inspire governments to change, and build economically viable business models that secure their livelihoods through participation across the entire waste value chain—from waste collection to safe disposal.

- Celebrated municipal waste efforts—such as single-use plastic bans, clean-city programs, and supporting tech-enabled waste start-ups—lead to cleaner, more modern cities. But they also reduce the amount of material for waste pickers to collect and earn an income from. However, it does not need to be a choice between supporting waste pickers and professionalising a city’s waste system.
- In every best practice example, government legislation has been a vital component in improving conditions for waste pickers. They can attain a healthier, safer, and more secure future—but rarely on their own.

- Different types of organisations serve different waste picker needs. Social justice and policy organisations build trust, community, and advocate for their rights. Livelihood organisations create long-term entrepreneurial opportunities, while waste enterprises can blend waste picker and other workforces.
- India and Brazil, arguably the two countries that have best supported waste pickers, followed similar steps to move waste pickers from subsistence living to greater opportunity. These countries (1) built solidarity among waste pickers, (2) enabled them to attain a healthier, safer, and more secure future—lead to cleaner, more modern cities. But they also reduce the amount of material for waste pickers to collect and earn an income from. However, it does not need to be a choice between supporting waste pickers and professionalising a city’s waste system.
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3. AFFORDABLE WASTE COLLECTION

Waste collection is the foundation of the entire waste management system and most important lever for keeping plastics out of the environment. This chapter broadens the definition of waste collection, presenting the strengths and weaknesses of nine diverse collection models. It also distils lessons learned from the field to build economically viable waste collection systems that can withstand the test of time and keep waste out of the environment, including strategies to increase revenue through multiple income streams and reduce costs with improved operational efficiency and worker productivity.

• The value created from processing waste is usually not enough to cover the full cost of waste systems, especially collection (which almost always runs at a net cost, especially when high-value recyclables are removed by waste pickers and residents). This gap between cost and value dissuades potential waste collection investors and entrepreneurs from dedicating time and resources; and creates a powerful disincentive for city governments to collect a community’s waste – the more they collect, the more expensive their fuel, vehicle maintenance and worker salaries, and the shorter their landfill life.

• Each organisation, government and private sector institution investing in or designing a waste collection system needs to consider whether their collection model catalyses an exemplary waste management system and most important lever for keeping plastics out of the environment. This chapter broadens the definition of waste collection, including decisions on which materials will be collected, whether waste will be collected from all households and businesses or a sub-set, and whether waste pickers will be supported and if so how.

• From an environmental and social point of view, the best collection systems ensure all non-organic waste is collected from all households and businesses, in a way that creates the waste system a region wants long term and thoughtfully includes waste pickers in the transition.

• Waste collection can take many forms from traditional charge-for-service models such as government or community-run collection, private hauler and social enterprise for-profit collection, micro-entrepreneurial haulers, and waste picker cooperatives; secondary collection by buying already collected waste from waste pickers, junkshops or waste banks and collection models where residents donate their valuable recyclable waste through recyclable collection points and/or waste picker entrepreneur programs.

• Each collection model has trade-offs. Some are less capital intensive and generate greater entrepreneurial opportunities—but are harder to ensure quality service delivery. Others are fast and efficient at collecting recyclable waste—but leave out the rest of the non-organic stream and may perpetuate less than ideal social and environmental norms. Others are capital intensive and entail managing large work forces and vehicle fleets—but have ultimate control over every aspect of the waste system.

• Innovative organisations are optimising their operations to be as low cost as possible and developing multiple, new revenue streams to cover expenses.

4. RECYCLING PLASTICS ECONOMICALLY

Recycling gives value to waste, transforming it into useful materials and products, rather than ending its useful life in a landfill or worse, in the environment. In most rapidly developing economies, recycling of high-value materials can be profitable without subsidies (albeit with low margins). However, only a small fraction of what can be recycled, actually is. Most waste plastics do not have enough value to justify the “collect-sort-transport-clean-recycle” process, making recycling in its current incarnation unlikely to be scalable or sustainable for most types of disposed plastic. This chapter however, explores strategies organisations have used to tackle common yet difficult plastic recycling challenges that have resulted in economically sustainable waste businesses.

• Virtually all kinds of plastic are technically recyclable, however, few are economically feasible to recycle especially in rapidly developing economies where 2/3rds or more of the plastic composition is “low value” flexible plastics like multi-layer single use sachets.

• Local organisations have found innovative ways to build viable recycling businesses by creating new markets for waste materials, by vertically integrating along the value chain to capture greater margins, by partnering with other organisations with different core competencies to create stronger product offerings, by marketing and setting up traceable supply chains for “materials of purpose” - ocean-bound and/or social, Fairtrade plastics that sell for a premium and by developing or adopting new technologies that enable recycling of normally hard-to-recycle materials. Stills these businesses generally focus on the highest value plastics, leaving a gap of economically viable recycling options for the lowest value plastics.

• Innovative recycling organisations also employ several strategies to reduce recycling costs in their operations including establishing centralised recyclable collection points so materials are brought to them and by building win-win partnerships with both large waste producers and with logistics providers to support the transport of materials to recycling hubs.

5. PROCESSING ORGONICS WITHOUT A LOSS

Organic waste is moist and heavy, making it a greater burden for waste collectors, both financially and technically. Once organic waste reaches a landfill, it releases harmful, fast-acting methane greenhouse gas—contributing to a country’s greenhouse gas (GHG) balance. When organic waste is not separated, it contaminates recyclable non-organic waste and thereby reduces its value by up to two-thirds. Additionally, it costs more to produce products like compost from such waste than the market will pay for it. Some organisations, however, have found ways to process organics into valuable resources that cover costs while also feeding the food chain, enriching the soil and plants, and/or providing low cost energy.

• One of the most important actions national governments and municipalities can take to reduce waste system costs is to incentivise communities to manage their own organic waste.

• Organic waste is rarely profitable for communities without financial support.

• To derive profit from organic waste, choose a processing approach that creates a product with local market demand such as compost, fertiliser, animal feed, biogas, charcoal briquettes, or natural pesticides.

• The ideal processing systems are simple and modular, enabling the testing of various configurations and processes before larger investments are made.

• Five strategies have been found that create as much value from organic waste as possible. These are (1) quality guarantees, (2) subscription fees, (3) vertical integration of operations, (4) GHG mitigation schemes, and (5) government...
and private sector buying agreements.

Focal organisations employed four tactics to reduce operating costs, including:

2. Bartering for land.
3. Building and buying equipment locally.
4. Engaging student and volunteer labour.

VITAL LESSONS FROM THE FRONTLINE

The recommendations below are systemic investment and regulatory policies that have proven to have the most significant impact on improving a nation’s waste system—which ultimately equates to how much plastic leaks into the environment. They come from listening to those on the frontline—voices rarely brought to the policy-debate table—but are those with perhaps the most knowledge about what it truly takes to fix waste systems on the ground.

6. RECOMMENDATIONS TO GOVERNMENT AND THE PRIVATE SECTOR FROM THE FRONT LINE

While some organisations manage to successfully break through the five most difficult universal constraints explored above, national governments and the private sector have the power to quickly and holistically solve the most difficult problems that face low-funded waste systems. They can remove these systemic constraints once and for all, fundamentally altering how waste systems and the incentives that drive them work, while building the foundation for broad entrepreneurial investment. This will make it easier for all frontline organisations to succeed, regardless of their location or how innovative their leaders are.

The ingenuity of local grassroots programs is impressive. This is part of what needs to be shared with the world. But if these small-scale successes cannot connect with large-scale markets, then their success is ultimately limited. When plugged into larger regional and national markets, their collected waste gains value, which makes it more economically feasible to collect, sort, and process.

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GREATER FUNDING LEVELS

Where investment is needed most:

- Waste collection: Adequately fund collection and safe landfill disposal systems at USD$40-70 per tonne of waste collected.
- Organics processing: Support clean development mechanisms (CDM) and voluntary carbon credits to catalyse industrial-scale organics processing and make progress on emission reduction targets.
- Recycling hubs: Invest in regional waste treatment “hubs” and upgrade existing informal recycling hubs and efficient transportation “spokes” with new hubs located in strategic recycling deserts, potentially through special economic zones such as recycling parks.
- Logistics infrastructure: Support transportation by truck and ship so recyclable materials travel further at lower cost, thereby requiring fewer recycling hubs.
- Microfinancing: Develop cooperative funding entities that can provide low-interest capitalisation to waste pickers and junkshops.
- Moonshot seed financing: Invest in technology of the future to create a paradigm shift in recycling systems and material design especially for lower value plastics.

Sources of investment:

- Indirect fee collection: Build national or regional indirect charge systems for household and business payment of waste collection services.
- Extended producer responsibility (EPR): Share the responsibility of end-of-life product costs while incentivising product recyclability and greater demand for recyclable feedstock.

GAME CHANGING POLICY RECOMMENDATIONS AND OTHER SUPPORT

ORGANICS

- National mandates to separate organic and non-organic waste material by households and businesses.
- Require large organic waste generators (e.g., restaurants, hotels, dormitories, residential complexes) to do on-site organics processing.
- Certify the safety and quality of organic products in order to build market confidence.
- Create a fair market for organic waste processing by giving composters access to subsidies similar to fertiliser manufacturers or remove/lower subsidies to create a fairer playing field.
- Subsidise the nascent organic-processing industry and assist it to develop market share.

WASTE COLLECTION

- Incentivise local communities to manage their own organic waste to keep it out of the waste stream.
- Centralise non-organic waste collection responsibility at the municipal level, or higher, and process waste at a local decentralised level to avoid it going to landfill.
- Support collection programs in small and medium-sized cities and rural areas, where waste collection levels are generally the lowest.

WASTE PICKER INCLUSION (AND RECYCLING)

- Recognise waste picking as an officially sanctioned occupation within national labour categories and provide occupational identification cards to empower the formal right to access, collect, and sell waste.
- Create a legal body within the national government to aid waste pickers in garnering greater legal rights and welfare.
- Give waste picker cooperatives the right to fulfil municipal waste collection contracts and take-back services to meet EPR requirements.

RECYCLING

- Reduce or eliminate recycling industry value added tax (VAT) when buying materials from waste pickers.
- Design products for end-of-use recyclability.
- Build economically viable scalable organisations by incubating organisations that work to curtail waste and ocean plastics.

Supporting and building effective waste collection, recycling, and organic waste systems will lead to greater amounts of plastics being collected, processed, and not dumped into the world’s oceans. This report is an effort to examine and share already proven solutions to build resilient waste programs from 45 organisations on the frontlines.