INCLUSIVE RECYCLING

Five Building Blocks for Implementing Sustainable Systems in Low & Middle Income Countries

D-Lab

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INTRODUCING INCLUSIVE RECYCLING

Inclusive recycling initiatives engage all actors in the waste management cycle (waste pickers, multinational companies, municipal governments, NGOs, recycling companies, residents, and others) to create shared value for each stakeholder that leads to broader economic, environmental, and social impact. Unlike in more developed economies, low-income countries tend to lack the infrastructure necessary to provide effective waste removal, recycling, and composting. Civil society and the private sector often fill this gap through targeted interventions.

Over the last decade, recycling in low- and middle-income countries has benefited from innovations such as business-to-business recycling models, technology to create second-life products from inorganic waste materials, means of generating value from organic waste, and, most notably, the organization of waste pickers into unions and cooperatives like KKPKP and SWaCH in Pune, India and Luz del Futuro in Nicaragua. Multinational companies such as Danone and Johnson & Johnson, social enterprises such as Wecyclers and TakaTaka Solutions, and others have contributed to innovations in inclusive recycling. However, more work is needed to create viable, inclusive, and scalable recycling solutions addressing the serious issues of public health, sanitation, and climate change. For these reasons, a PIA member proposed inclusive recycling that incorporates the work of waste pickers as a working group theme.

Over the last decade, recycling in low- and middle-income countries has benefited from innovations such as business-to-business recycling models, technology to create second-life products from inorganic waste materials, means of generating value from organic waste, and, most notably, the organization of waste pickers into unions and cooperatives.

There is a growing global movement of waste pickers working to keep recyclable material out of dumpsites, streets, and waterways. An estimated 20 million people collect and sort plastic, metal, paper, and cardboard around the world today (ILO 2013). Thanks to a number of efforts by organizations like Women in Informal Employment: Globalizing and Organizing (WIEGO), GAIA, and the Avina Foundation, waste pickers have organized into national and international associations or unions that increase agency and bargaining power.

RedLACRE, for instance, a waste picker association in Latin America, is comprised of an estimated 1,500,000 members from fifteen countries. Although these informal waste experts are some of the foremost environmental workers of our time, we have not yet realized an appropriate economic model to adequately compensate them for the services they provide (with the exception of some Brazilian cities and Bogotá, Colombia, where waste pickers are paid as public service providers based on the amount of waste they collect and recover).

While knitting together stakeholders into a comprehensive and inclusive system can require expensive initial outlays, the resulting models have proven far less costly over the long term, and are certainly more economically and environmentally sustainable in countries such as India, Brazil, Argentina, and Colombia. Even so, no one-size-fits-all program or model exists to set up an inclusive system, and there are many challenges to growing and sustaining such systems. The PIA Inclusive Recycling Working Group took the opportunity to consider the aforementioned case studies to understand the essential principles of and steps in creating an inclusive model, analyzing the essential features and pros and cons of each documented approach.

This document is intended as a practical guide for those working to design and implement inclusive recycling systems around the world.

The key stakeholders in an inclusive recycling system are:

WASTE PICKERS

Informal collectors of recyclable material that often work in dumpsites or streets, gathering, sorting, and selling material—most often to middlemen, but also to the recycling industry.

RESIDENTS

Dwellers living in the town, city, or region where an inclusive recycling system is being implemented.

MUNICIPAL AND NATIONAL GOVERNMENT

The governmental body within the country and region where the inclusive recycling system is being implemented.

NON-GOVERNMENTAL ORGANIZATIONS

Organizations that work independently of the government to help develop inclusive recycling programs by supporting waste pickers or offering environmental services.

LOCAL ANCHOR INSTITUTIONS

Large organizations and businesses, such as hospitals and universities, that generate large amounts of waste.

RECYCLING BUSINESSES

Enterprises that pay for recyclable material and either transform those materials into new products or provide some processing of material and sell it to local and global buyers.

MULTINATIONAL CORPORATIONS

Multinational corporations bring needed products to low and middle income markets but also contribute to waste generation.

FIVE KEY BUILDING BLOCKS FOR DEVELOPING AN INCLUSIVE RECYCLING SYSTEM

The case studies examined by the MIT PIA Inclusive Recycling Working Group produced five key building blocks for developing an inclusive recycling system, which are summarized here and described in more detail below.

1. BUILD A COALITION THAT ENGAGES BUSINESSES & INSPIRES ACTION

Corporations must responsibly provide a unified strategy to manage their packaging once it becomes waste by: a) co-funding inclusive and environmentally sustainable solid waste management initiatives; b) supporting the creation of a policy framework that requires businesses to responsibly manage their waste packaging; and c) sharing learnings from their individual efforts to responsibly manage their waste products and packaging in the long term.

2. WORK WITH GOVERNMENT TO CREATE AN INCLUSIVE POLICY FRAMEWORK

Laws must be created and enforced that call for local producers to responsibly manage their waste packaging and require municipalities to incorporate the informal sector into local solid waste management systems.

3. LAUNCH A PUBLIC AWARENESS CAMPAIGN

Campaigns must be launched to sensitize community members and other stakeholders to the importance of recycling waste material and the need to properly segregate material.

4. ORGANIZE & NETWORK THE WASTE PICKERS

Waste pickers should be organized (whether in cooperatives, unions, or other associations) and provided with leadership training to understand that a) they have a right to participate in the solid waste ecosystem and b) strategies exist to exercise that right effectively.

5. SUPPORT THE DEVELOPMENT OF WASTE PICKER SOCIAL ENTERPRISES

Waste pickers should be provided the opportunity to organize into small and medium-sized enterprises. They can then be offered business management training and related support to allow them to grow successful enterprises that are fully incorporated into the solid waste management ecosystem.

The following section describes case studies that demonstrate each of the five building blocks necessary for implementing a sustainable, inclusive recycling system. These case studies offer best practices, barriers, challenges, and lessons learned.

ONE: BUILD A COALITION THAT ENGAGES BUSINESSES & INSPIRES ACTION

WHAT

Extended producer responsibility (EPR) is a concept increasingly embraced by companies—not only as part of their corporate social responsibility strategies, but also as part of their core business strategies. While many simply seek to improve the recycling rates of consumer product packaging, some companies are re-envisioning processes such as material sourcing, product design, distribution, reclamation, and more to make their overall operations more circular and sustainable. Embracing EPR at the individual company level is crucial to enabling inclusive recycling, and companies that join in coalitions—whether they are organized primarily by those corporations or involve outside parties as conveners and enablers—can have an even bigger impact.

WHY

As producers of substantial amounts of waste through their operations, their packaging, and indirect waste from consumer products, the actions taken and signals sent by corporations can have significant reverberations throughout an ecosystem. The case studies examined in this group demonstrate how companies can make significant contributions to inclusive recycling goals by organizing and influencing networks of key stakeholders. Such companies can also incorporate inclusive principles into their own operations and initiatives.

Best Practices and Lessons Learned

DANONE PARTICIPATES IN CEMPRE

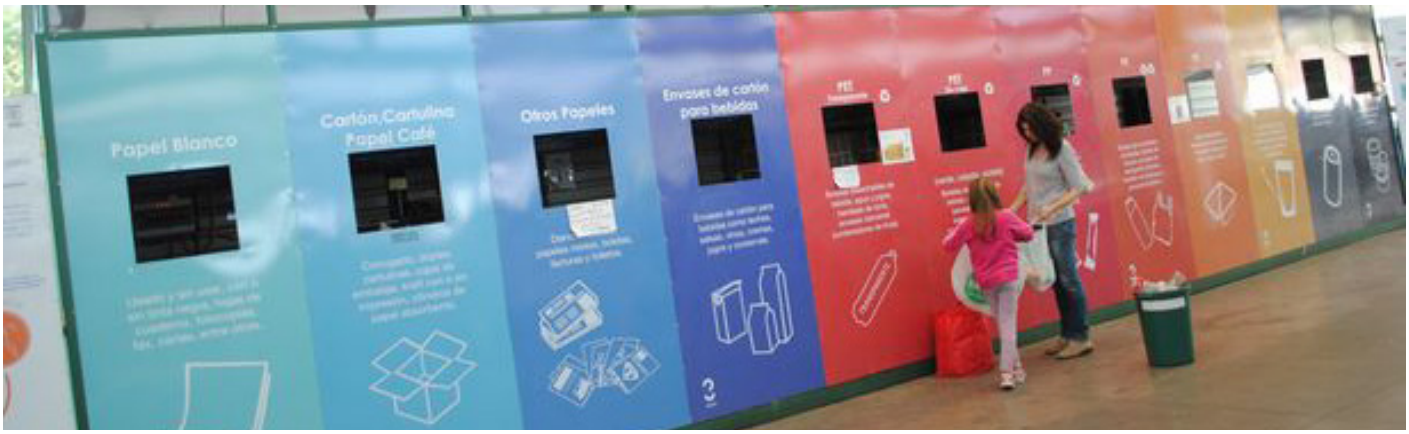
Danone participates in a coalition of businesses in Brazil called Compromisso Empresarial Para Reciclagem (CEMPRE) (http://www.cempre.org.br/). CEMPRE, a nonprofit organization, was launched in 1992 for corporations to research policy framework and second life options that promote circular economies through the integrated management of solid waste and the basic concept of "reduce, reuse, and recycle." CEMPRE currently has thirty-two member businesses, including Hershey, Coca-Cola, Heineken, Nestle, and Danone, and was instrumental in building Brazil's inclusive recycling framework. They are currently engaged in supporting the creation of inclusive policy in other Latin American countries, where each country receives specific recommendations for waste management activities according to its social and economic contexts.

Danone, however, has moved far beyond its participation in CEMPRE to make an impact on recycling in Brazil by a) re-using its own waste material to fabricate packaging and b) increasing collection and recycling rates through its engagement with a network of waste picking cooperatives in its Novo Ciclo program. To date, the program has achieved a 40% recycling rate of Danone's product packaging and has increased monthly waste picker earnings by more than 50%. Now in the third phase of the program, the Danone Ecosystem Fund intends to move into the state of São Paulo, an expansion that will reach 1,700 new waste pickers in seventy cooperatives by 2018. Danone is not only interested in further improving cooperatives' operational efficiency and bargaining power; it has embraced the coalition-building aspect of inclusive recycling and is now looking to build similar coalitions of concerned and engaged businesses in Africa.

TRICICLOS CLEAN POINTS COLLECTION CENTERS

The Inclusive Recycling working group examined a successful model of a third party—in this case a scaling social business—leveraging corporations' interest in EPR to enable companies to contribute to inclusive recycling systems in concrete ways.

Compromisso Empresarial Para Reciclagem (CEMPRE), Brazil



TriCiclos, Chile

Based in Chile, TriCiclos uses its model not only to inspire action by local and multinational companies, but also to provide concrete guidance as to how companies can advance their inclusive recycling goals. Through its Clean Points Collection Centers, TriCiclos offers compelling branding and compliance opportunities for companies. Clean Points are located in highly visible and trafficked locations in communities—the parking lots of supermarkets, universities, condos, and public spaces—and companies with a local presence pay for the construction and upkeep of the Clean Points and brand them. By bringing multiple companies (often consumer product companies) together at each Clean Point, TriCiclos builds connections among stakeholders. Additionally, companies in each area can monitor waste in real time as it makes its way to Clean Points, enabling these companies to set and meet relevant internal goals and external compliance requirements.

TriCiclos then leverages the knowledge generated from more than 240 Clean Points to deliver trainings and host other conversations with corporations to help them improve their processes and product design, ultimately encouraging recycling and closed loop processes. TriCiclos works with companies on a one-on-one consulting basis, but as its client base grows and expands, it is contributing to an informal collection of corporations that have embraced EPR principles and are poised to contribute to inclusive recycling ecosystems. TriCiclos has found many companies to be receptive to these trainings, and the most committed companies engage representatives from various areas of their businesses (product design, operations, marketing, and more) to inform a comprehensive sustainability strategy.

GLOBAL RECYCLING INFORMATION PLATFORM

Technology like the Global Recycling Information Platform (GRIP) has begun to emerge as businesses become increasingly focused on responsibly managing their waste, particularly packaging, in ways that promote social gains to the informal sector. GRIP is a web-based system (also available as an Android app) that enables real-time registration and monitoring of transactions—any time recyclables are moved from one actor to another, or when the recyclables are processed in some way.

GRIP allows for different functionality at the national, municipal, and transactional levels. In this way, it enables accurate and real-time traceability for producers at different points along the value chain. This can be a game-changing opportunity for corporations (and other stakeholders) to track the movement of materials throughout a system and determine interventions that will make the system more efficient and inclusive. Ultimately, many stakeholders can benefit from the services provided by GRIP, including producers, recycling companies, municipalities, countries, and waste pickers. For example, companies that have extended producer responsibility goals can leverage the traceability functions to show if and how the recycling goals set by the company are being achieved. Additionally, the reporting functions aggregate data (whether input by individuals, businesses, or other actors) and provide reports that can inform strategy or operations and even influence policy.

While the GRIP platform is still in the initial stages of rollout, we can look to a pilot in Colombia for lessons learned. The GRIP team was funded by the Dutch government for the first iteration of the platform, called MarColombia. This iteration was so successful in its pilot phase that the Colombian Ministry of Housing adopted the platform as its due diligence and traceability system for related policies, and also as a means to pay the country's diversion credit to recyclers. In addition to the benefits described above, the platform is a way to bring formal and informal recycling activities and actors into a standardized system, ensuring that all are operating in a legal and mutually beneficial way. The team also learned some valuable lessons from this initial stage. For instance, the quality of reporting, and therefore the platform's utility, is only as good as the quality of the data input. While there are systems in place to ensure reliability and accuracy of data, the system is not perfect. It is also important to incorporate training for the users of such a tool, particularly given that it involves many different types of stakeholders and has many customization options.

TWO: WORK WITH GOVERNMENT TO CREATE AN INCLUSIVE POLICY FRAMEWORK

What

To enable environments that foster the development of sustainable inclusive recycling systems, it is beneficial to devise and enact a national policy framework that requires corporations to take responsibility for the waste packaging they are introducing into the waste stream, to protect waste pickers' rights to access waste, and to bring dignity to waste pickers by requiring that they be incorporated into formal waste management systems at the local level. Some countries are closing dumpsites and others are now beginning to ban plastic bags and low- and high-density plastic, especially in Africa. Ultimately, a well-designed inclusive policy framework has the potential to inspire multinational corporations to practice EPR, create circular economies where they can potentially capture and re-use their waste materials in the creation of new products, and support the implementation of waste picking cooperatives.

Why

There are examples of solid waste policy supporting the work of waste pickers in India, Colombia, and Brazil, but the Brazilian model is the most mature at this time in many ways. Among the measures and instruments described by Brazil's 2010 National Solid Waste Policy (PNRS – Law 12305/2010) are the consideration of waste pickers' social inclusion and economic compensation and the use of EPR to require the recycling of equivalent amounts of waste for every kilogram of production. In this way, the government has compelled stakeholders to co-create innovative systems and programs that are economically, environmentally, and socially beneficial.

Brazil's 2010 National Solid Waste Policy:

- Establishes targets to shut down all open-air dumpsites
- Requires selective collection incentives and reverse logistics
- Requires corporations to recycle equivalent amounts of waste for every kilogram of production
- Creates a National Environmental Fund
- Requires engagement of waste pickers in municipal solid waste management systems by encouraging and prioritizing the creation and development of cooperatives and other types of associations

Best Practices and Lessons Learned

Johnson & Johnson's FUTURA Waste Picking Cooperative

Project Phoenix was launched in San Jose in the State of São Paulo so that it could be situated near the largest Johnson & Johnson (J&J) manufacturing plant in the world. Brazil's solid waste management policy, combined with a large national organization of waste pickers, made this country the perfect setting for J&J's pilot inclusive recycling model.

This project sought to address two key challenges: 1) how the cooperative, called FUTURA, could find a reliable outlet for its recycling streams and thereby contribute to a more circular economy; and 2) how to guarantee that the cooperative could reliably provide quality paper and cardboard to potential buyers. To overcome these challenges, J&J provided capacity-building

FUTURA waste picking cooperative

Danone, Novo Ciclo network of waste picking cooperatives

workshops to the FUTURA cooperative so that it could receive the SA8000 global work standards certification. Once this goal was achieved, J&J was able to link FUTURA with local packaging industries interested in buying the quality material produced by the cooperative.

Although several risks have emerged that have kept FUTURA from achieving economic self-reliance (J&J is still supporting the cooperative), a change in the local political landscape was the most difficult to overcome. FUTURA lost its municipal contract when a newly elected local government recently took office, and because of economic difficulty, was forced to reduce their staff size and move locations. However, FUTURA has since regained the municipal contract and has moved into a better location in which to sort materials.

J&J recognizes the possibility that not enough effort was put into maintaining such a key relationship during the leadership transition. In addition, the recent downturn in Brazil's economic landscape has made it difficult for the cooperative to reach economic viability. J&J has suggested that diversifying the services provided by the cooperative could be one way to mitigate the volatile recycling market. J&J has also recently expanded the scope of their work in San Jose dos Campos to include a second co-op known as Recicla.

DANONE'S NOVO CICLO NETWORK OF WASTE PICKING COOPERATIVES

Novo Ciclo is a project borne out of the Danone Ecosystem Fund that works with waste pickers in southeastern Brazil to provide capacity building and technical assistance to cooperatives. Danone's staff is matched with cooperative leaders to address the needs of their respective communities, which may include streamlining operations, strengthening relationships internal and external to the cooperative, and improving waste picker incomes. Inspired by Brazil's National Solid Waste Policy, Danone has set an ambitious goal of enabling second-life opportunities for 100% equivalent by weight of the plastic packaging it produces. The organization is approaching this goal in three ways.

- **Weight recovery:** Danone intends to reach its goal in part by collaborating with waste picking cooperatives to recover more recyclables.
- **Research:** Danone is looking to develop second-life solutions for polystyrene (PS), which is used in its product packaging.
- **Responsible sourcing:** Danone is intentionally developing circular economies by sourcing responsibly and closing the loop in an inclusive circular economy. (For instance, it has already established a network of cooperatives that are selling cardboard and Tetrapak packaging directly to Tetrapak.)

THREE: LAUNCH A PUBLIC AWARENESS CAMPAIGN

What

Just as government and producer buy-in and support are important enabling factors for successful inclusive recycling initiatives, so is informed engagement by consumers. Much of the world's food, packaging, consumer products, and other materials pass through households before they become part of the waste stream or recycling value chain. Therefore, many successful inclusive recycling interventions involve consumers as key actors in the ecosystem. While some consumers are aware of why and how recycling can create environmental, social, and economic value, much confusion (at best) and disregard (at worst) persists about the broader implications of recycling and how consumers can become involved in a specific initiative. Garnering consumer buy-in to segregate materials is one of the most important aspects of a thriving inclusive recycling initiative. While many comprehensive recycling initiatives have included public awareness campaigns that employ signage and public service announcements on local radio and television stations, some recycling efforts have used other innovative methods and creative incentive schemes to create public awareness that leads to beneficial behaviors.

Why

Targeted awareness-building efforts serve inclusive recycling initiatives by creating and building a customer base that not only understands the environmental significance of segregating material, but is capable of effectively sorting recyclable material. Segregation at source allows for cleaner material, which makes recyclable material more marketable. In addition, if it is done well, awareness-building campaigns allow municipalities to capture more recyclables, which diverts material from the landfill or dumpsite and preserves natural resources. Ultimately, to facilitate an appropriate scale of operations and achieve more broad-reaching social and environmental impact goals, awareness campaigns among residents and other stakeholders can help to build a movement that encompasses, but also extends beyond, inclusive recycling initiatives.

Wecyclers, Lagos, Nigeria (Photo: AFP)

Best Practices & Lessons Learned

WECYCLERS' INCENTIVE PROGRAM MODEL

Not surprisingly, tailoring the message and method of delivery to the local audience is key to building awareness and buy-in. For example, Wecyclers recognized early on that getting through to its audience—low-income households in Lagos, Nigeria that tend not to receive municipal recycling services—would require a face-to-face approach. For this reason, Wecyclers representatives spend time in key neighborhoods, having one-on-one conversations with residents to explain how their company's services work and why the residents should use them.

Residents in that market have been more likely to show skepticism or resistance to recycling, especially segregating material, so a more in-depth conversation is required to gain understanding and buy-in. Explanation of how the incentive system works and how recycling can reduce the catastrophic flooding caused by plastic waste (which directly affects these neighborhoods) is key. Once a new customer is registered, Wecyclers uses SMS-based messaging (and has a smartphone app in development) to communicate and reinforce messages with its customers.

However, despite the success of Wecyclers' resident sensitization campaign, the approach has presented challenges of scale. This type of outreach and awareness-building is labor- and resource-intensive, requiring substantial staff training and time in the field while reaching a relatively small number of people. This is an ongoing challenge Wecyclers seeks to address as it scales, and the company is experimenting with different approaches to further supplement in-person outreach with SMS and smartphone application messaging, among other ideas.

Just as Wecyclers has found the need to meet customers where they are—in and around the places where they live—TriCiclos uses a similar approach to build awareness of the importance of recycling and segregation among residents. TriCiclos' Clean Points, primarily located in grocery store parking lots, serve as eye-catching and more-or-less permanent fixtures to draw residents to recycling in an informed way and become part of a broader social movement.

TriCiclos employs former waste pickers, who are stationed at each Clean Point and serve as friendly and knowledgeable recycling ambassadors. Residents bring many different types of recyclable material to Clean Points as donations and, with support from these staff and ample signage, feel empowered to carefully segregate their waste. TriCiclos also uses these Clean Points as a hub for larger-scale educational events and locally relevant entertainment, in an effort to expand the messaging of its awareness campaign beyond recycling and build a broader grassroots sustainability movement.

Universidad de la Frontera, Chile

UNIVERSIDAD DE LA FRONTERA LAUNCHES A CAMPAIGN

Another organization focused on building awareness and buy-in to spark inclusive recycling at the university-wide level is the Universidad de la Frontera in Temuco, Chile. The university has launched a number of pilot campaigns aimed at encouraging recycling of non-organic material, waste oil, and more among its campus community.

These campaigns go beyond educating members of the campus community on the importance of recycling, in an effort to build a cultural movement in a place that has not traditionally paid much attention to these issues. Given the audience, the university's campaigns focus primarily on social media, and also incorporate visual signage across campus and a range of educational and social events. The campaigns are gaining traction among students, faculty, and university administration, and the organizers are setting their sights on reaching the broader city community and, eventually, other parts of the country.

The campaigns at Universidad de la Frontera have benefited from a relatively captive audience with shared interests compared to the broader community. The team involved in these initiatives recognizes that the same messaging and approach will not necessarily be successful if duplicated beyond the university community, so it may face some challenges to sustaining momentum if the campaigns are extended to a more diverse audience.

TAKATAKA SOLUTIONS EDUCATES FARMERS ABOUT COMPOST

TakaTaka Solutions of Nairobi, Kenya has faced difficulty gaining buy-in on material segregation among residents (see more below), so it has focused its awareness efforts on a different part of the value chain. In addition to processing and selling recyclables, 60% of the waste that TakaTaka Solutions now collects and processes is organic material, which it processes and sells to local farmers as compost. TakaTaka is the only company to make and sell compost in the city of Nairobi as of 2016, and it recognized the market as nascent early on. Local farmers, the primary customers, are skeptical about the quality of compost produced from household waste. TakaTaka has therefore targeted its awareness-building efforts to reach local farmers, educating them not only about the quality of their compost, but also how to use it most effectively in local conditions. In addition to using local media, the company operates a demonstration farm at its composting site located on the edge of the city.

TakaTaka Solutions has faced challenges in its outreach to Nairobi residents. Despite trying several different approaches, such as providing financial incentives or educational messaging on local environmental benefits, the company has not been successful in generating resident buy-in on segregating material prior to pickup. Despite the challenges this poses to processing and selling the material, TakaTaka has chosen to focus less on these awareness-building efforts, and has instead adapted its operations to sort materials at sorting sites. Although this method requires manual sorting by employees (and related investments in training and equipment to ensure a safe and effective process), the shift has enabled TakaTaka to work around this hurdle.


TakaTaka Solutions, Nairobi, Kenya (Photo: TakaTaka Solutions)

FOUR: ORGANIZE AND NETWORK WASTE PICKERS

What

Just as workers in many industries and contexts have realized the benefits of forming networks and organizational structures such as cooperatives or unions, waste pickers can experience improvements in their living and working conditions by organizing and networking. However, waste pickers may face bigger hurdles to doing so than others. On the whole, waste pickers tend to have low levels of formal education and literacy, face high social stigmatization, and, as members of an informal economy, lack the protections or benefits provided by policy and legal frameworks. Organizations—whether they be existing international organizations with a local presence, new grassroots efforts in the community, or others—have been instrumental in working with individuals and groups of waste pickers to organize into unions that can ensure they are recognized and compensated for the important work they perform in an inclusive recycling system.

Why

The movement-building aspect of the inclusive recycling puzzle is key to incorporating informal waste pickers. In most places around the world, waste pickers tend to work alone and sell to two or three middlemen before the material makes its way to a final buyer. Therefore, although they are an integral piece of the value chain, waste pickers receive the least amount of money of anyone in the chain for the services they provide. Furthermore, because most waste pickers live in extreme poverty, they often feel as though they have no voice within the waste management ecosystem, and are at times forbidden from having access to waste, either by local authorities or private waste management companies.

Best Practices & Lessons Learned

KKPKP builds a union and a business

KKPKP was formed in 1993 as the world's first trade union of waste pickers. Its mission was to put pressure on authorities and shape a solid waste management model that incorporated the work of waste pickers in the city of Pune. Fifteen years later, in 2008, KKPKP created a single waste cooperative, SWACH, that won a municipal contract to provide door-to-door collection in the regions of Pune, India where it is located. Through organizing, waste pickers were granted dignity and legitimacy in the eyes of the government, such as by acquiring ID cards. KKPKP is currently working with waste pickers to pressure multinational corporations to offer sanitary waste products that allow for waste picker dignity and shape a national policy of waste management legislation that includes the waste pickers.

A key learning from this case study was that, with the support it needed from KKPKP, SWCH was able to demonstrate to the municipality that it could provide waste collection services in a more effective and cost-efficient manner than private collectors. Therefore, armed with data and bargaining acumen, it won initial and renewal contracts from the local government. The organization was also able to advocate for what made sense in the local context during these negotiations, maintaining a decentralized waste management system that incorporated waste pickers instead of moving to a more centralized model.

KKPKP and SWACH also understand the importance of capacity building and leadership development among members. More than 2000 members of SWACH, which is cooperatively owned by members of the union, receive leadership and other trainings, advocating for and implementing education programs for children, health care, and other topics.

Ultimately, this case study demonstrates that it takes time to organize waste pickers into a union that fully meets their needs. Trying to accomplish too much at once or too quickly can be less beneficial. For example, SWACH lost the municipal contract at one point, which then took time to win and reinstate.

Danone's Novo Ciclo program coordinates a network of cooperatives

Another example of how organizing waste pickers led to increased bargaining power is Danone's Novo Ciclo Program, which has established regional networks of waste picker cooperatives. This program has succeeded by organizing cooperatives into networks to increase waste picker bargaining power with industry and government representatives. Danone supports such networks in sharing information about the quantities, locations, and market prices of materials within the cooperatives, and assists network leaders in negotiating fair prices with buyers. Generally speaking, most cooperatives in Brazil are forced to sell to middlemen and do not receive the full value of the materials they collect. Through Novo Ciclo, many cooperatives that previously had difficulty accumulating sufficient quantities of material, or that were beholden to unfair agreements with powerful middlemen, can now earn more money and achieve independence by selling directly to manufacturers. Furthermore, participating in Novo Ciclo-supported networks helps cooperatives earn the legitimacy, acknowledgment, and compensation they rightfully deserve for the important services they provide to society.

FIVE: SUPPORT THE DEVELOPMENT OF SUSTAINABLE WASTE PICKER SOCIAL ENTERPRISES

What

The beauty of working with waste pickers, either to organize and launch a new business or develop an existing business, is that most already understand the value of recyclable material and have a good sense of the local value chain. Even so, existing waste picker cooperatives—and individual waste pickers, since many work on their own—often need business management training to succeed. Areas of need often include managing and scaling operations, accounting and payroll, human resources, and human development. In addition to receiving training in various business disciplines, waste pickers can benefit from tools to support increased earning potential, such as technology like mobile applications, databases, etc.

Business management training curricula: Many types of curricula have been used to teach waste pickers how to best manage their businesses, from a classroom-type approach (used by Johnson & Johnson with the FUTURA cooperative in Brazil) to an experiential co-design pedagogy, as in the case of Luz del Futuro in Bluefields, Nicaragua, which allows waste pickers to learn key business skills as they co-create their business models.

Tools, particularly mobile applications (apps): In addition to business management training, tools are being developed to enable waste pickers to more effectively reach consumers, better access the recycling market, and more. Given the proliferation of mobile technology in low-income countries, including among waste picker populations, mobile apps are increasingly being developed to support waste pickers in a variety of ways, as new offerings by existing ventures in a particular location or as products to fill a gap in multiple markets. Overall, such apps are a recent development in the field, and the PIA working group identified this emerging space as an opportunity to contribute our collective knowledge by engaging in a co-design process that conceptualizes an app aimed at improving waste pickers' earning potential.

Why

Although waste pickers already have a great deal of expertise on waste segregation and knowledge of the recycling value chains in the cities or regions where they live, they often lack formal education and business administration or technical knowledge on how to effectively run waste sector businesses, such as collection and/or sorting centers. In reality, some waste pickers decide to work on their own, either because they are fiercely independent or they choose to adhere to their own schedules (there are business models that allow individual waste pickers to participate in the benefits enjoyed by members of a local cooperative). However, building waste picker businesses allows for movement building, which increases the chance that individuals will have a voice in the creation of an inclusive solid waste management policy framework. Such businesses also allow for greater income opportunities because larger quantities of recyclable material generally receive higher rates per kilogram. Allowing waste pickers the opportunity to come together to build businesses and receive training can allow for movement building, affiliation, and stronger bargaining power, resulting in stronger businesses.

Best Practices and Lessons Learned

Johnson & Johnson employs a classroom-based curriculum

J&J's Project Phoenix uses a curriculum that provides health and safety training and promotes the development of management systems over a twelve-month time-frame. Specifically, the Phoenix methodology applies SA8000's management systems approach to create a resilient social and operational infrastructure for responsible growth, connects social accountability with environmental stewardship, and teaches its approach to scaling and accelerating the achievement of mutual social, environmental, and economic goals along the value chain. Project Phoenix's trainings, which have been developed over the last ten years, review previously taught content to reinforce learnings and add new material on a weekly basis. This method, which includes lessons taught in a classroom setting and technical "on the job" training in quality sorting and business management, is guided by the principles set forth in the SA8000 certification. The Project Phoenix program model and approach to training is currently being expanded through the Inclusive Waste Recycling Consortium (iWrc) sponsored by Johnson & Johnson and Kimberly-Clark.

MIT D-Lab uses a highly experiential co-design approach

An MIT D-Lab curriculum that supports waste pickers in their efforts to build businesses was first developed to support the creation of a recycling cooperative of thirty-four women waste pickers in Bluefields, Nicaragua. The curriculum uses a co-design methodology to build a business with waste pickers over a year-long period.

In addition to the co-design component, the approach uses a highly experiential pedagogy to teach key business lessons such as bookkeeping, management, supply chain analysis, and leadership, along with agency-enhancing empowerment tools that have been proven to positively affect revenue. After administering the training, it became clear that the women who made up the Luz del Futuro business needed additional support. Therefore, D-Lab created a business coaching program in which local mentors were secured to provide monthly sessions that reinforced learnings and supported the business members while they envisioned business growth, set short- and long-term goals, and worked to meet those goals.

DEVELOPMENT OF AN APP TO SUPPORT INCLUSIVE RECYCLING

By examining case studies of innovative inclusive recycling initiatives, members of the PIA working group identified an opportunity to harness insights from the case studies, member expertise, and external research to collaboratively develop a practical tool that supports efforts in this space. In light of the context described in this report, the group chose to focus on a digital application that could improve the lives and livelihoods of waste pickers while adding value for other stakeholders in the recycling ecosystem. In the following pages, we document the co-design process, insights, initial validation, and planned next steps for the concept developed by the working group.

Mobile Application Functionalities

In some circumstances, a tool such as a mobile application can serve as a mechanism for waste pickers to successfully implement practices learned in business management training. However, by performing a global scan, the working group learned that such apps are few and far between: some have demonstrated some initial success, but room exists for further understanding and action. Therefore, the working group decided to leverage insights from all of the case studies it examined and supplemental research by MIT students (link to report) to co-design app features that could then be validated and developed for a test case.

Although the group recognized the potential value of generating an app concept that could be applied to many different contexts, given the vast variety of environments and circumstances in which waste pickers work, members decided to focus on certain contexts so the concept could be validated and eventually implemented in a meaningful way. Thus, the concept was based on the assumption that waste pickers who could use such an app were already organized in cooperatives and had access to smartphones—conditions that exist in the communities in which Danone and Johnson & Johnson have done inclusive recycling work, for example. Through this iterative co-design process, the working group identified two solution spaces to develop and test.

The first concept uses an app to enable waste picker co-ops to network and agglomerate materials in ways that increase volume, yielding greater earnings. The rationale uncovered through lessons from the case studies is that co-ops who join forces in a network can reach the scale needed to do direct business with recyclers, allowing them to obtain better prices and perhaps even eliminate the need to use a middleman who would cut into the co-ops' margins. The group determined the potential for high impact if this app were implemented.

The second concept is an opportunity for the app to improve links between residents and waste picking cooperatives. By encouraging behaviors such as household-level material segregation, this strategy could enable waste picking co-ops to develop more efficient routes and sell higher-quality recyclable material at higher prices. This strategy would likely yield more incremental impact for the co-ops. The co-design process used to identify these functionalities is outlined below.

Recycling cooperative member, Sao Paulo, Brazil

The Co-Design Process

The app co-design process within the PIA Working Group switched between a divergent and convergent approach, as is frequently the case in innovation.

The first stage was to gather information (diverging). Through the PIA working group discussions, ten case study presentations, secondary research, and individual interviews with members of the working group, the design team created an up-to-date landscape of the situation of waste pickers around the world.

After broadening our scope in the first stage, the group narrowed its focus in the second stage by framing the problem (converging). By distilling the gathered information, it became clear that the two primary pain points experienced globally by waste pickers are a lack of bargaining power and a lack of operational efficiency, leading to reduced income.

With these two pain points in mind, the design team and the working group started generating possible solutions in the idea generation stage (diverging).

Three potential solutions emerged from these sessions:

- An online platform to increase access to information for different actors
- An online platform to facilitate connections among different actors
- A mobile app to improve waste picker operations

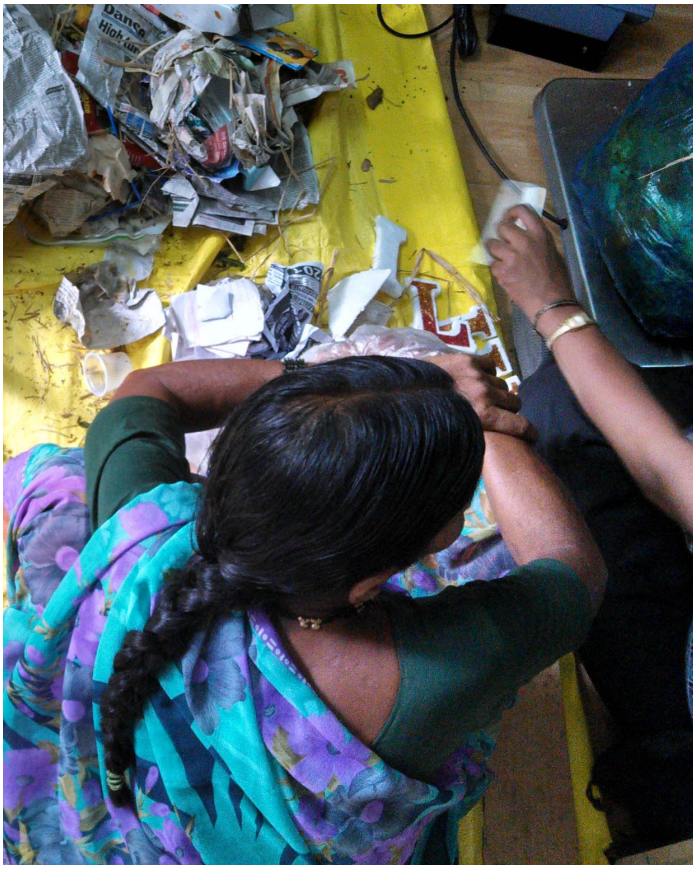
The solutions were based on the information gathered in the first stage, notably that mobile phone penetration among waste picker communities is high and that improving waste picking cooperatives' operations could dramatically increase their revenue.

As these ideas all leveraged mobile or online technology, the next stage focused on identifying the key features (converging) that a digital solution should present.

Seven features were analyzed and compared, after which the group chose to focus on three:

- Leverage geo-localization to connect waste pickers with the nearest segregated recyclables around them
- Design an online marketplace for recyclables with which waste pickers can view fair prices for each material and cooperatives can trade immediately with recycling plants
- Facilitate the crowd-sourcing of waste between various cooperatives so they can compete with the volume of waste offered by middlemen.

To validate some of the group's assumptions and avoid duplication, two MIT students conducted a global scan and analysis (diverging) of existing inclusive recycling digital apps. These apps, used in very different geographies, presented some key insights on what works and what does not.



SWaCH (Solid Waste and Collection Handling), Pune, India

These insights were carried into the last phase of the design process, validation through a test case (converging). One of the MIT students visited the Danone Brazil Novo Ciclo project to test the designed solution spaces, initiate a mapping of the local recycling ecosystem and relationships between key stakeholders, identify key insights and questions needing validation for each solution space, and develop next steps for each solution space to be validated.

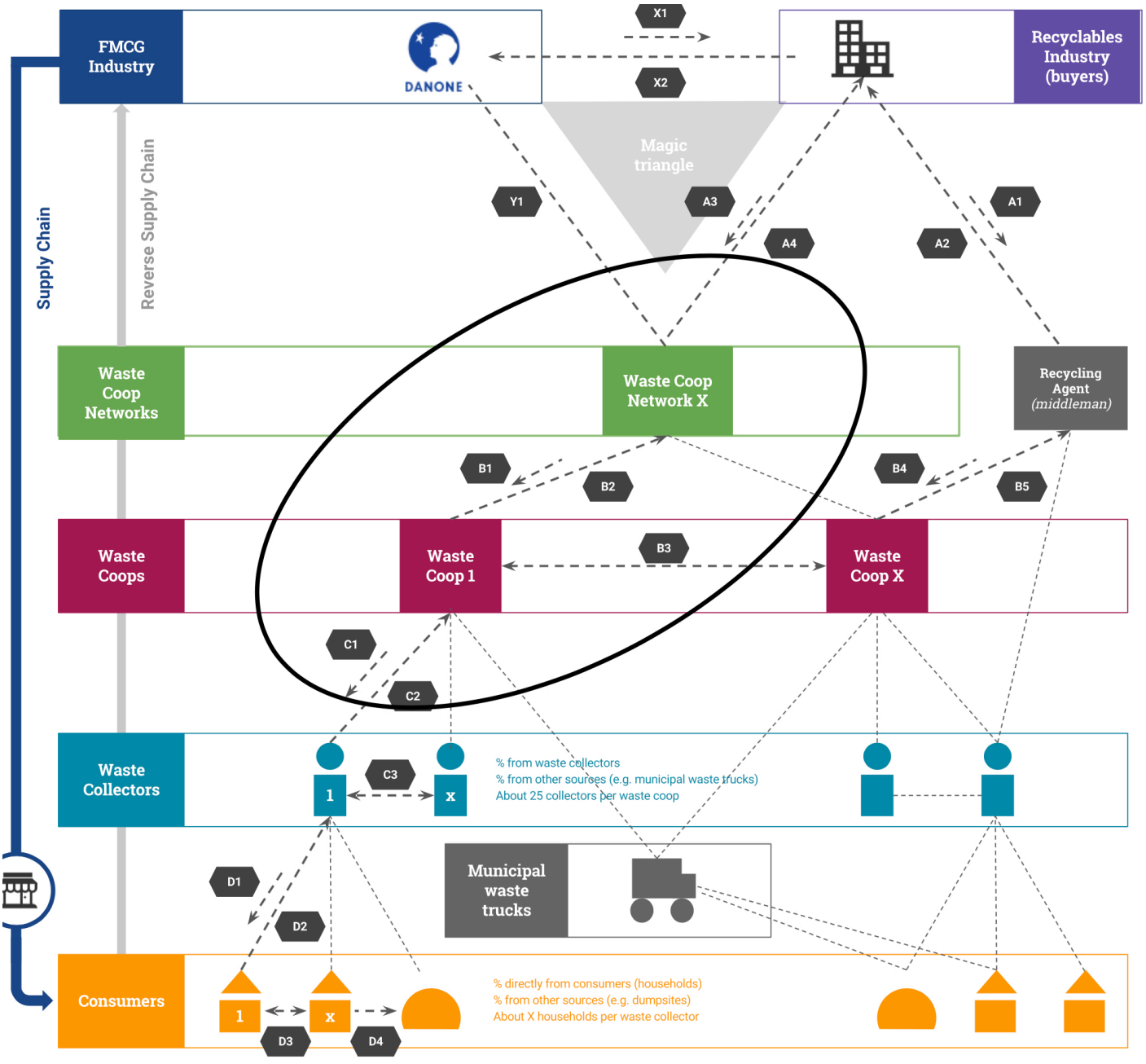
Mobile Application Functionalities Identified for Validation

After the working group engaged in the co-design process, BoP Inc. sketched two solution spaces to be validated in waste picking cooperatives. Solution space A allows many waste picking cooperatives to agglomerate material, yielding greater earnings for waste pickers. In this way, the app functions as a virtual transfer station. Solution space B is designed to provide added value to additional actors. This functionality improves the link between residents and cooperatives, encouraging households to sort their recyclables and providing waste pickers the opportunity to efficiently collect waste door-to-door, which allows them to capture a greater volume of cleaner material and secure higher earnings per kilogram.

SOLUTION SPACE A

Agglomerate materials from networked cooperatives to increase volume, yielding greater earnings for waste pickers.

Recycling Ecosystem: Stakeholder Map (based on the Danone Novo Ciclo Case)



Logic

Coops joining forces in a network allows them to reach scale needed to do business with recyclers directly, which in time may cut out middlemen that currently get a high margin on selling recyclable waste.

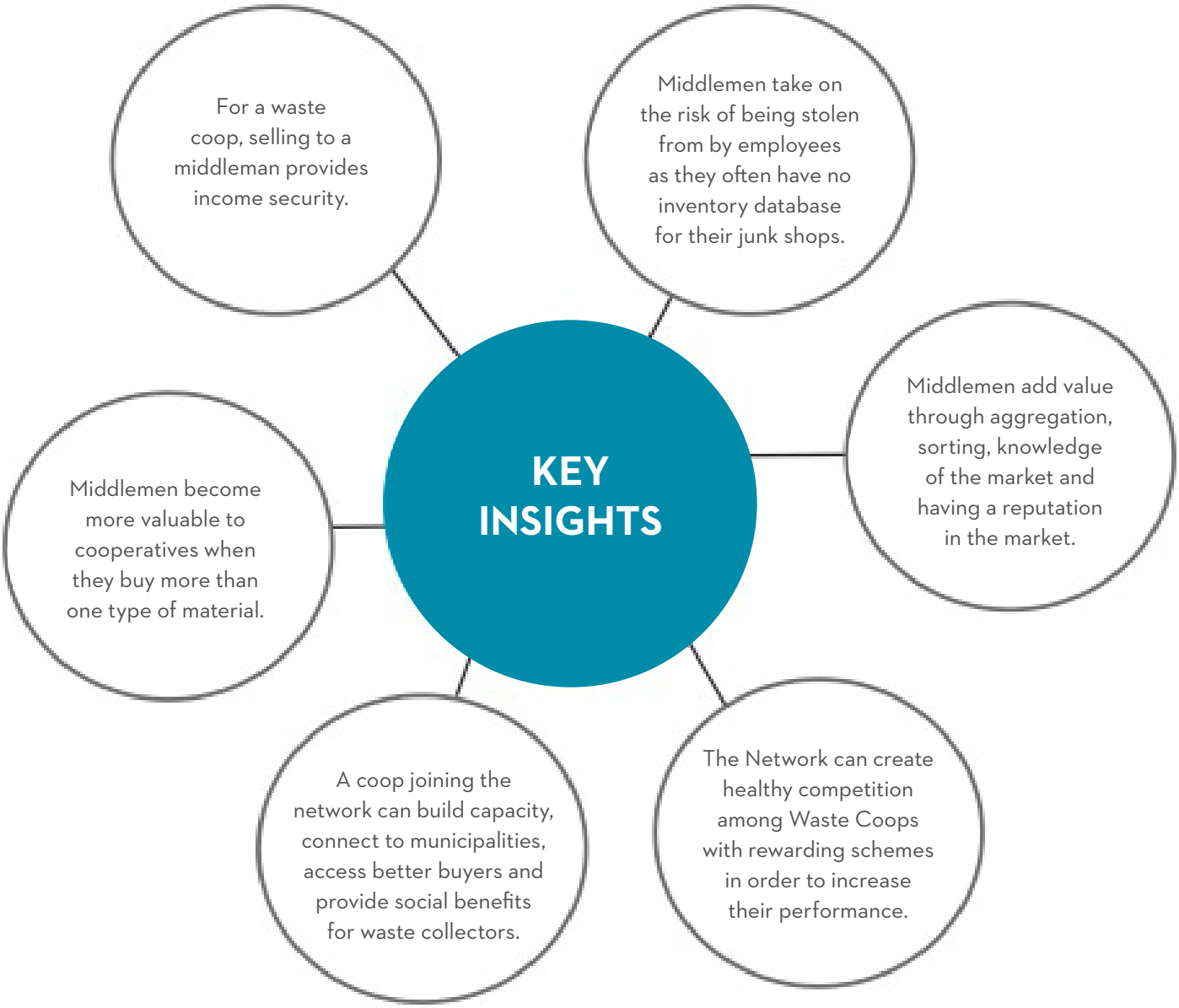
Challenge

Reach scale, set-up an entire network, cut out middlemen. Get access to recyclers.

Impact

High impact.

Key Insights: Supporting a cooperatives' network by cutting out middlemen



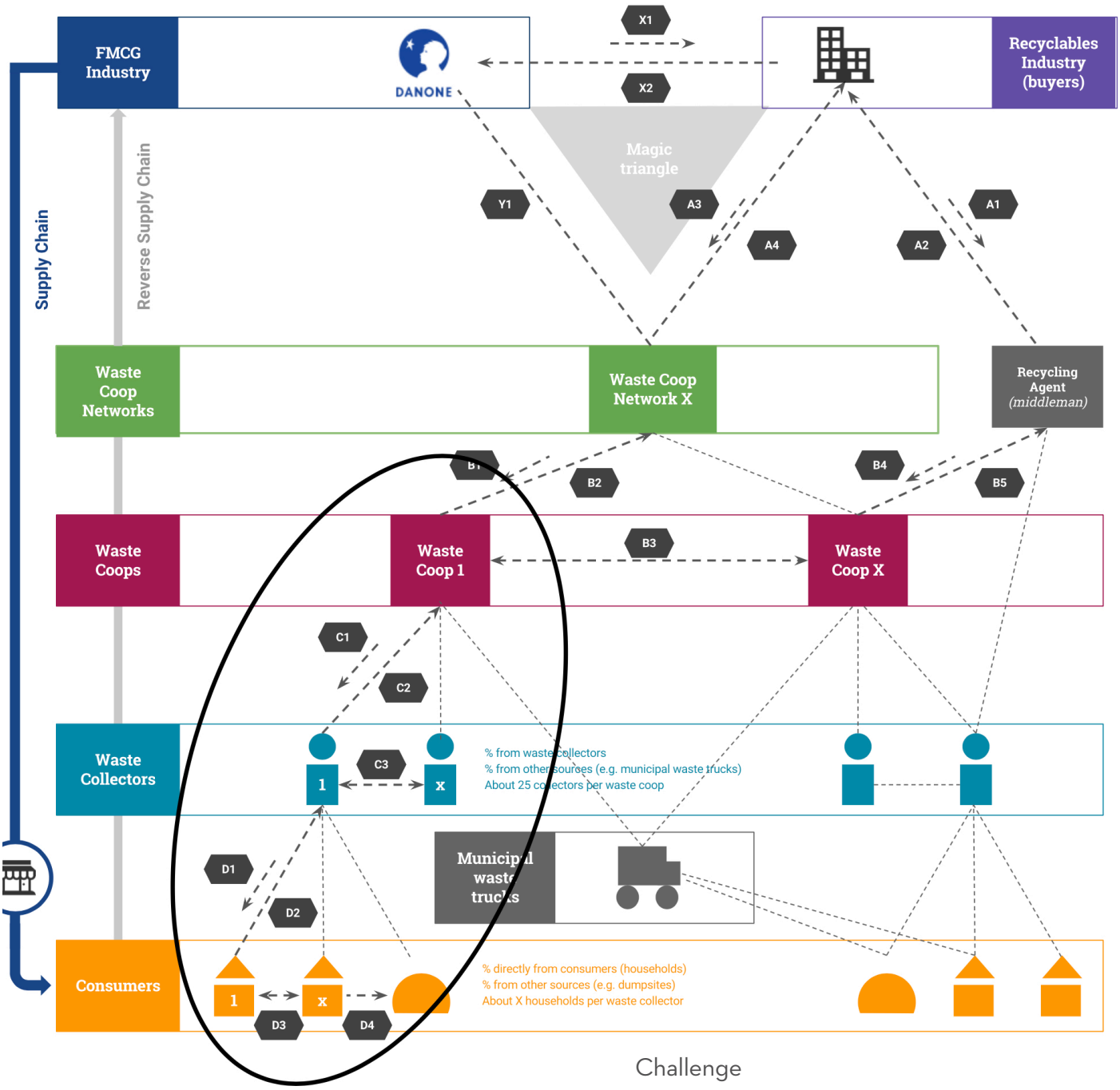
KEY REMAINING QUESTIONS

- Is the recyclables industry already buying from the network? If so, how are the challenges of transportation and scale resolved?
- What are the challenges of hiring the middlemen as part of the network?
- How does the network currently deal with risk of stealing by employees?
- Do cooperatives in the network currently communicate with each other? If so, how and on what

SOLUTION SPACE B

Improve links between residents and cooperatives to enable waste picking coops to become more efficient and sell higher quality recyclable materials.

Recycling Ecosystem: Stakeholder map [based on the Danone Novo Ciclo case]



Logic

Having better and direct access to clean and segregated waste allows waste pickers to become more efficient and coops to process and sell more and higher quality waste.

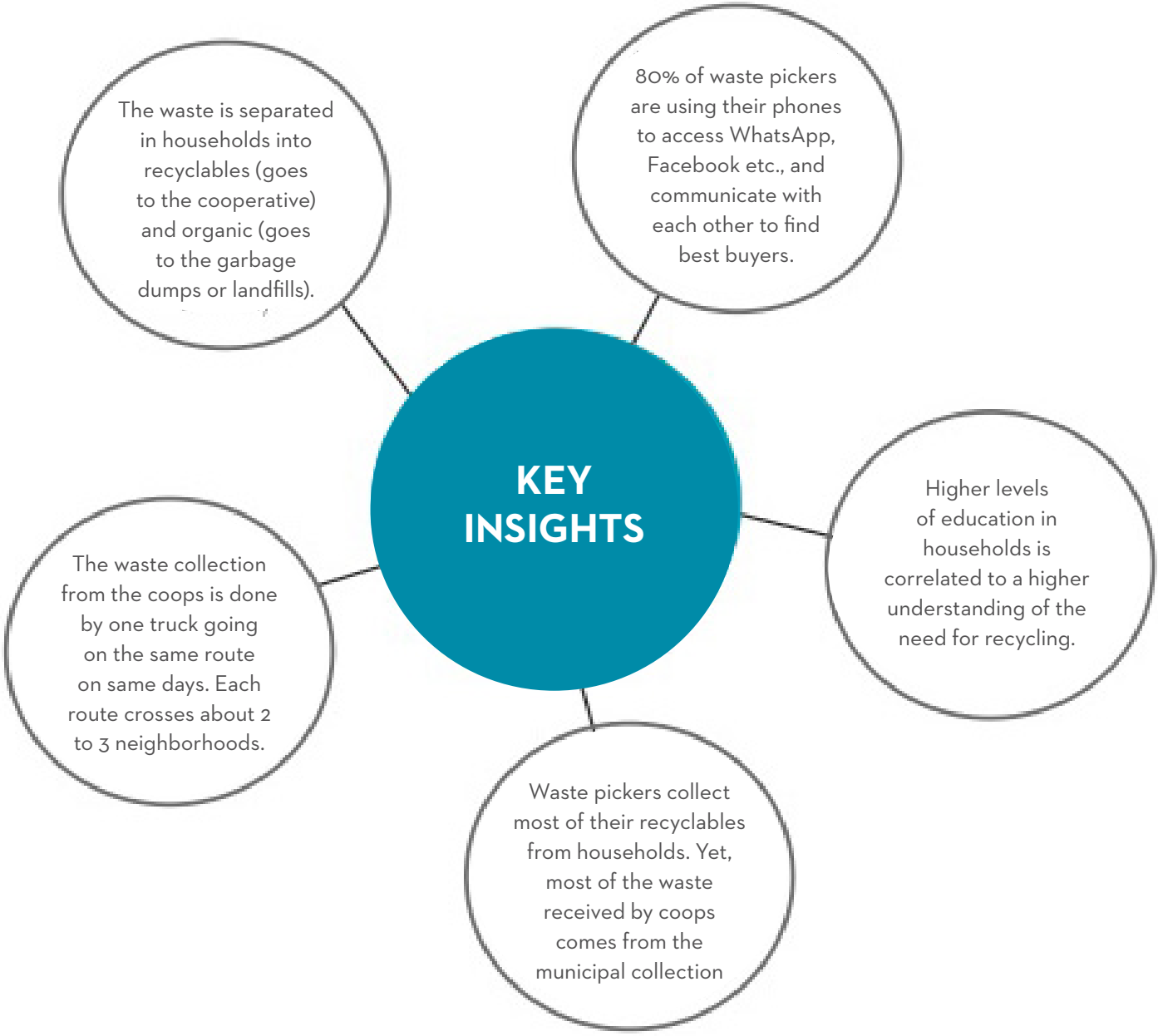
Challenge

Consumers need to be willing to offer (and if possible segregate) their waste.

Impact

The impact will likely be of incremental nature.

Key Insights: Improving the link between residents and cooperatives



KEY REMAINING QUESTIONS

- How do waste pickers distinguish recyclables from non-recyclables in trash in front of houses? E.g. Different trash bags?
- How do waste pickers organize themselves for waste pick up: always same teams? How are the trucks financed?
- What is the current incentive for households to segregate waste? Sense of civic responsibility?
- How do waste pickers know which households have recyclables and which do not?

MIT D-Lab

MIT D-Lab works with people around the world to develop and advance collaborative approaches and practical solutions to global poverty challenges. The program's mission is pursued through interdisciplinary courses, research in collaboration with global partners, technology development, and community initiatives — all of which emphasize experiential learning, real-world projects, community-led development, and scalability.

MIT Practical Impact Alliance

The MIT Practical Impact Alliance (PIA) harvests the power of collaborative learning and action to increase, accelerate, and sustain impact on global poverty. Organized by MIT D-Lab, PIA is a membership organization of leaders from diverse organizations with aligned missions who learn, collaborate, and develop best practices together. PIA working groups focus on addressing a knowledge gap of the group and in the field, with the goal of generating outputs that will serve as relevant, practical tools for PIA members and a broader audience.

PIA Inclusive Recycling Working Group

In 2016, PIA formed a working group focused on inclusive recycling. Through monthly case presentations and discussions, the group examined the relationships between different actors in inclusive recycling value chains and explored how to design programs and interventions that generate shared value for all. In addition to a global scan of existing recycling mobile applications (apps) (link to student research report), the group co-created a concept for a practical tool—an app to increase waste picker earnings—and examined ten case studies to highlight key strategies for implementing inclusive recycling systems. The working group included the companies Danone, Johnson & Johnson, and Philips Healthcare; non-profits the Melton Foundation (including Melton's network member Universidad de la Frontera, Chile), World Vision, and the OCP/Phosboucraa Foundation; and social ventures TakaTaka Solutions (part of the Siemens Stiftung Empowering People Network) and Wecyclers. Thanks to Talia Fox for her contributions.

Authors

Libby McDonaldk MIT D-Lab
Dana Gorodetsky, MIT D-Lab
Lucia Fernandez, WIEGO
Saskia Rotshuizen, BoP Inc.

Icon: Aldric Rodrigues from Noun Project.