



FROM THE MARGINS TO MAINSTREAM

A White Paper on Integrating
Informal Sector Workers into
Formal Economies in Southeast Asia

A 2024 CASE STUDY BY



© All rights reserved

Evergreen Labs Advisory Company Limited 2024



Evergreen Labs, headquartered in Singapore with country offices in Vietnam and the Philippines, is a creative business lab focused on social, circular economy venture building in Southeast Asia since 2016. Our purpose organization aims to solve pressing environmental and social challenges through innovative, circular social businesses in emerging Asia and beyond.

To date, we have built and currently operate four social enterprises and use our grassroots expertise to work with development organizations, private sector businesses, and governments on various projects across SEA. Our core expertise lies in solid waste management (primarily plastics), agriculture value chain, water, circular economy models (including reuse systems & closed-loop supply chains), upcycling technology, and responsible, inclusive supply chains.

Evergreen Labs pioneers accessible sustainability through decentralized innovation. We build affordable, ground-up solutions that bring the circular economy to those who need it most, transforming environmental challenges into opportunities for all.

TABLE OF CONTENTS

P. 03	Research Introduction
P. 04	• Purpose of the report
P. 04	• Abbreviations
P. 05	• Executive summary
P. 07	Background
P. 08	• The origin of the informal waste sector & collectors
P. 09	• Informal Sector in Vietnam
P. 11	Critical Gaps in the Waste Value Chain
P. 15	Innovation in Action: Closing the Waste Gaps
P. 17	• Empowering Informal Waste Workers
P. 20	• Maximizing Recovery
P. 22	• Value-Driven Infrastructure
P. 26	• Closing the Loop
P. 28	• Digital Plastic Waste Tracking
P. 29	▪ Tracking for Change: EXN's Integrated Plastic Waste Management Solution
P. 30	▪ Waves of Change: Empowering Fishermen in the Fight Against Ocean Pollution
P. 33	Recommendations
P. 35	• Identifying Your Role in the Ecosystem and Maximizing Engagement
P. 36	• Conclusions
P. 37	References



A man wearing a black cap and a dark tank top is standing on a large pile of trash, sorting through it. He is holding a large, light-colored sack. The background is a cloudy sky. The text "RESEARCH INTRODUCTION" is overlaid in the center in large, white, bold letters.

RESEARCH INTRODUCTION

PURPOSE OF THIS REPORT

This report delves into the critical role of Informal Waste Workers (IWWs) within the waste management system. Our primary focus is to analyze the **challenges** IWWs face and the **opportunities for formalizing their work**, ultimately improving their working conditions and stabilizing their income.

One major obstacle for IWWs is the lack of formal recognition by public authorities. This exclusion results in several hardships, including inadequate income, limited access to essential resources, and poor health due to the lack of safety equipment.

While acknowledging these challenges, the report also **showcases the innovative interventions and strategies implemented by Evergreen Labs across the past eight years**. Their initiatives, such as training programs, protective gear provision,

business integration, and more, have demonstrably improved the well-being of IWWs.

However, **achieving long-term sustainability requires a broader effort**. The report emphasizes the need for collaboration between organizations, public authorities, and society as a whole. By working together, we can facilitate the integration of IWWs into the formal economy.

This report advocates for a sustainable future for both the workers and the waste management sector. Collaboration is key to enhancing working conditions, increasing recognition of IWWs, and creating a more equitable and sustainable system.

Ultimately, we aim to highlight the vital contributions of IWWs and call for collective action to address the challenges they face through innovative, formalization integration strategies.



ABBREVIATIONS

EPR	Extended Producer Responsibility
EXN	Extended Resources Network
IWWS	Informal Waste Workers
MAS	Master Aggregators
MRFS	Materials Recovery Facilities
NGO	Non-governmental Organization
OE	Obliged Enterprise
OSH	Occupational Safety and Health
PRO	Packaging Recycling Organization
TCN	The Collector Network
USD	United States Dollar

EXECUTIVE

This white paper provides an overview of the key challenges faced by informal waste workers (IWWs) in waste collection and the initiatives undertaken by Evergreen Labs to address these challenges in Vietnam and across Southeast Asia.

IWWs in developing countries like Vietnam face issues such as unstable income, social discrimination, and health risks. The region struggles with establishing a well-organized plastic waste recycling system, marked by gaps in source segregation, limited solutions for low-value plastics, and insufficient infrastructure. Evergreen Labs has implemented various initiatives to support IWWs, promote source segregation, ensure proper waste management, recycle low-value plastics, and empower IWWs through formalization, ultimately improving their livelihoods and contributing to a sustainable circular economy.

Evergreen Labs' Interventions

Evergreen Labs has been at the forefront of addressing these challenges through various innovative initiatives aimed at integrating IWWs into the formal economy. These initiatives support IWWs, promote source segregation, ensure proper waste management, recycle low-value plastics, and empower IWWs through formalization,

improving their livelihoods and contributing to a sustainable circular economy. Key interventions include:

- **Empowering Informal Waste Workers (The Collector Network):** Providing resources, training, and support to IWWs, improving their livelihoods and safety.
- **Maximizing Recovery (Business Connection Program):** Partnering with businesses to enhance waste segregation and collection, ensuring stable income for IWWs.
- **Value-Driven Infrastructure (Materials Recovery Facilities and Master Aggregators):** Establishing dedicated facilities to streamline waste processing and improve recycling rates.
- **Closing the Loop (ReForm Plastic):** Developing low-cost, scalable technologies to recycle low-value plastics, empowering local entrepreneurs through a social franchise model.
- **Digital Plastic Waste Tracking:** Implementing digital tools to ensure transparency and efficiency in the waste management supply chain.

Impact and Outcomes

These interventions have led to significant improvements in waste management practices and the livelihoods of IWWs. Highlights include the



SUMMARY

formalization of over 11,400 IWWs, with 1,400 IWWs joining The Collector Network and 10,000 IWWs benefiting from Reform Plastic. These improvements have led to enhanced income stability, improved health and safety standards, and increased recycling rates. By transforming low-value plastics into valuable products, Evergreen Labs has demonstrated a viable model for sustainable waste management that supports economic growth and environmental protection. Overall, Evergreen Labs aims to transform the informal waste sector into a driver of a circular plastic economy while simultaneously enhancing the livelihoods of IWWs. Through their initiatives, Evergreen Labs strives to create a more sustainable and inclusive waste management system in Southeast Asia.

Recommendations

To further enhance the integration of IWWs and improve waste management systems, the report recommends:

- Enhancing collaboration and partnerships among government bodies, private sector entities, NGOs, and academic institutions.
- Implementing comprehensive training programs for IWWs to improve safety and efficiency.
- Strengthening infrastructure and technology to support waste segregation and recycling.

- Promoting policy and regulatory support, including Extended Producer Responsibility (EPR) schemes.
- Enhancing community engagement and awareness to foster sustainable practices.
- Providing financial and health support to ensure the well-being of IWWs.

Conclusions

The integration of informal waste workers into formal waste management systems presents a significant opportunity for Southeast Asia to achieve both environmental sustainability and social equity. Evergreen Labs' initiatives highlight the potential of innovative, collaborative approaches to address existing challenges and drive progress towards a circular economy. By building on these efforts and addressing ongoing challenges, stakeholders can create a more efficient, inclusive, and sustainable waste management ecosystem that benefits all. In conclusion, the initiatives undertaken by Evergreen Labs address the challenges faced by IWWs in waste collection and contribute to the development of a circular plastic economy. By improving the working conditions and livelihoods of IWWs, Evergreen Labs aims to create a more sustainable and inclusive waste management system that benefits both the environment and the community.





BACKGROUND

The origin of the informal waste sector & collectors

In low and middle-income countries, waste management typically falls under the jurisdiction of the local authorities, with some involvement of other sectors of society. Yet, due to a lack of efficient waste management solutions, as well as restraint in financial resources, facilities, manpower, and also lack of knowledge. Material and resource recovery within the waste management system remains largely unregulated and fragmented. This calls for better development of waste management, as most waste ends up in centralized landfills (sanitary or open dumpsites) in the best-case scenario without proper extraction, sorting, and appropriate treatment.

The informal waste workers (IWWs) are waste collectors who work outside of the official waste management structure. Nonetheless, they have become the cornerstone of collecting and sorting recyclable waste outside residence homes, office buildings, and landfills. They will then sell collected materials to consolidators and aggregators, who will send the waste to be processed and recycled.

These workers, primarily concentrated in low and middle-income countries, are estimated to be between 15 to 20 million workers worldwide. They are responsible for collecting and recycling more than half of the plastic waste generated globally (Dias & Ogando, 2015).

Despite their significant contribution, IWWs face unstable incomes, social discrimination, and poor labor protection. Often overlooked, they are at risk of exclusion from the formal waste management system, which can lead to social stigma and further discrimination (USAID, 2023).

Belonging to the group of lower-middle-income countries, Vietnam has made progress in managing solid waste on land, but there are still limitations in the official waste collection system that prevent the proper sorting of plastic waste for recycling.

A report on Vietnam's plastic waste in 2022 (WWF-Viet Nam, 2022) estimates:



With a growth rate of 5% per year,
2.93 Million
tons of plastic waste was generated in 2022

2.4

million tons of waste collected

0.89

million tons of waste sorted

0.77

million tons of waste recycled

Source: WWF-Viet Nam. (2023). Report on plastic waste generation in 2022. Vietnam Panda.

Informal sector in Vietnam

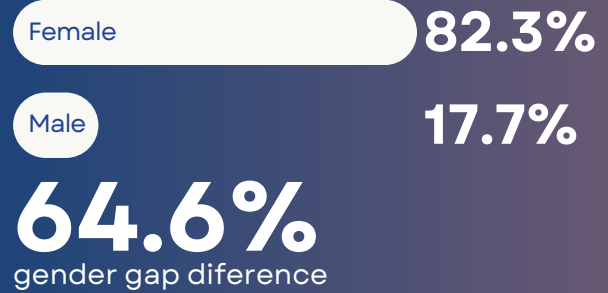
Vietnam has made progress in managing solid waste on land, but there are still limitations in the official waste collection system that prevent the proper sorting of plastic waste for recycling. A report on plastic waste in 2022 by WWF Vietnam estimates that approximately 2.93 million tons of plastic waste will be generated, with a growth rate of 5% per year. However, only 2.4 million tons of waste were collected, 0.89 million tons were sorted for recycling, and only 0.77 million tons of plastic waste were recycled. Therefore, a substantial amount of leakage waste to the environment in Vietnam is due to an insufficient management system, limited infrastructure, long transport distances, and lack of source segregation.

It's worth noting that over 90% of recycling activities are undertaken by informal waste sectors, with the majority of workers being women (Salhofer et al., 2021). Informal waste collectors face significant challenges in increasing their income. Their ability to collect waste is constrained by limited carrying capacity and basic supplies. Additionally, natural elements such as storms, intense heat, and rain further impede their access to and collection of recyclable materials. This precarious situation makes them vulnerable to exploitation and leaves their already unstable income at the mercy of external factors.

Furthermore, these workers are constantly exposed to hazardous and potentially toxic environments. The lack of proper protective gear and safety protocols significantly increases their susceptibility to health hazards, which can lead to permanent injuries.

Building upon the collaborative research with UNDP in 2020, Evergreen Labs has continued the research and gathered updated information on IWWs in Da Nang City. As the city is experiencing rapid urban development, this causes a significant increase in solid waste. This trend is attributed to the growth of the service and tourism industries, as well as the high density of consumers in the city.

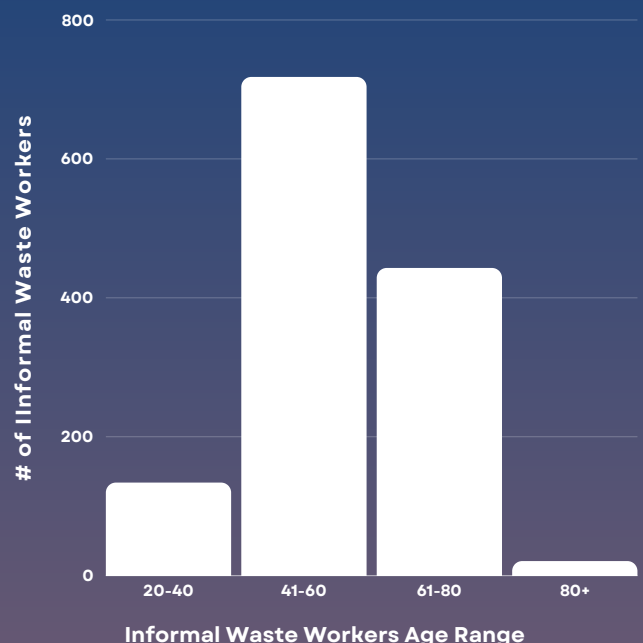
Figure 1: IWWs genders in Da Nang City



While increasing the number of IWWs participating in collection efforts could create a more significant workforce in Da Nang City, it's important to acknowledge the current landscape. Estimates suggest there are between 1,000 and 1,800 IWWs currently operating in the city (UNDP, 2020). Our recent census conducted at the end of 2023 identified 1,338 active IWWs in Da Nang. Notably, the majority of these workers are **women (82.3%)** and **older adults (54.6% aged 41-60, 33.7% aged 61-80, and 1.6% over 80)** (Figure 1, 2).



Figure 2: Numbers of IWWs x age range in Da Nang City



An analysis of IWWs' work experience reveals a historical trend. Prior to the 1980s and 1990s, Da Nang's slower urban development and lower population density led to a reduced number of IWWs, as evident by those with extensive experience (21-30 to 41-50 years). However, rapid urbanization since the 2000s has significantly increased solid waste generation (Baophapluat, 2024). This surge in waste has attracted individuals with limited or unstable incomes to waste collection jobs (IWWs with less than 10 years to 21-30 years of experience) (Figure 3).

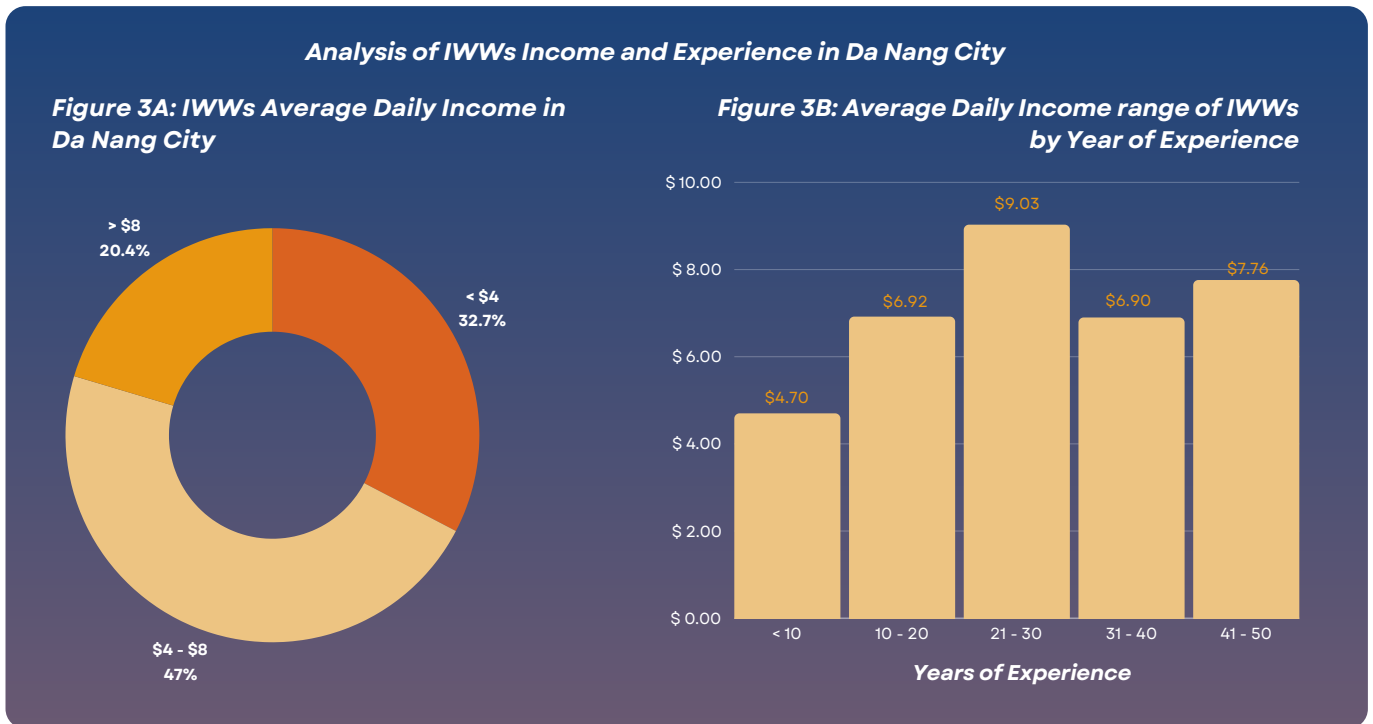
This influx of workers has intensified competition within the IWW community, making it difficult for them to improve their income levels. Their average daily earnings of approximately 4-8 USD (Figure 3A) often lead them to work long hours and disregard health risks to maximize their income and support their families.

The daily earnings of IWWs increase with the number of years of experience in waste collection (Figure 3B). The trend depicts a rise in income from less than 10 to 21-30 years of experience. The difference in experience and income can be attributed to IWWs saving to establish a central point of contact, setting up a fixed collection location, building stronger relationship with household and businesses, and gaining more

experience in collection techniques. Nonetheless, accounts of IWWs suggest that experienced workers attach great significance to the **relationships established** with other IWWs, streets, and collection points. As a result, they consistently collect more materials than their less experienced counterparts—better relationships lead to higher volume.

According to Figure 3B, for IWWs with more than 21-30 years of experience, age becomes a significant factor that affects their income. Those who are unable to establish a collection point or a larger facility still perform the same job they did previously, traveling around the city to gather valuable scrap items to sell to collection points. Due to long-term exposure to hazardous environments, older IWWs often face health issues, leading to a decrease in their collecting ability and income despite having experience.

In conclusion, Da Nang's recent urbanization has spurred an influx of IWWs, intensifying competition and limiting income potential. While experience leads to slightly higher earnings, health concerns associated with aging can undermine income gains for long-term workers. This highlights the need for improved waste management systems that can integrate and support IWWs for a more sustainable and equitable future.





CRITICAL GAPS IN THE WASTE VALUE CHAIN

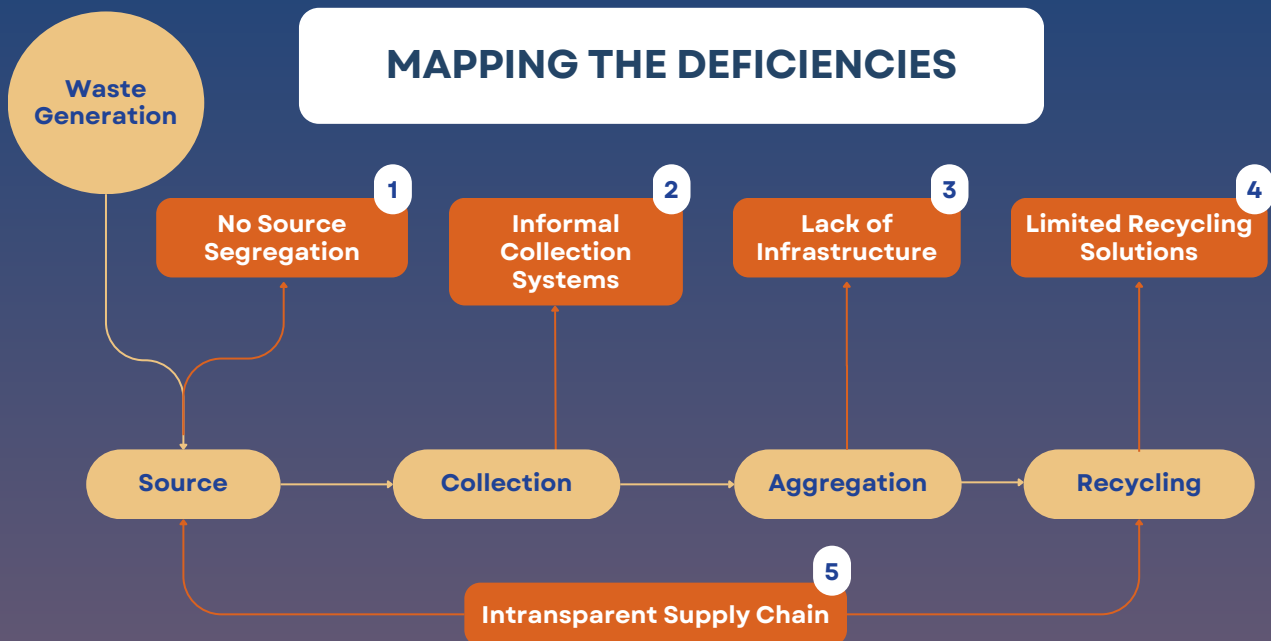


Figure 4: The gaps identified in the plastic waste supply chain in Vietnam

Vietnam faces significant hurdles in effectively recycling plastic waste due to the absence of a well-established formal system. Here's a breakdown of the key challenges:

- 1 No Source Segregation:** The absence of strict regulations and an official system for sorting waste at its source hampers effective & efficient waste management overall.
- 2 Informal collection systems:** The waste collection and classification system relies on informal sectors, leading to inconsistencies, lack of transparency, and inefficiencies.
- 3 Lack of infrastructure:** The lack of formal infrastructure for collecting, aggregating & pre-processing plastic waste impedes traceability and proper recycling.
- 4 Limited recycling solutions:** There are very few recycling options available for mixed waste and for low-value or non-recyclable plastics, leading to their accumulation and environmental pollution.
- 5 Intransparent Supply Chain:** The inability to trace the origin of plastic waste creates an untransparent supply chain, complicating efforts to monitor and improve recycling processes.

Implementing an Integrated Waste Management System

To address challenges in plastic waste traceability and recycling efficiency, we have tested and piloted a comprehensive system that integrates formal processes with the Informal Waste Workers (IWWs):

- **Source Segregation:** Implement structured waste segregation at the point of origin through designated collection points, household-level programs, or partnerships with waste management companies.
- **Efficient Collection:** Utilize pre-sorting to streamline collection, reduce material leakage, and engage the informal sector for further sorting and classification based on material type and recyclability.
- **Centralized Aggregation:** Establish aggregation centers for pre-processing sorted waste, further classifying and preparing plastics for efficient recycling.
- **Specialized Recycling:** Employ appropriate recycling and diversion facilities to convert plastic waste, including hard-to-manage plastics, into usable materials through mechanical or chemical processes.

Integrating IWWs into this formal system offers significant benefits:

- **Enhanced Data Tracking:** Accurate monitoring of plastic waste volumes throughout the process.
- **Improved Livelihoods:** Formalized roles provide stability and fair compensation for IWWs.
- **Optimized Efficiency:** Combine IWWs' expertise and networks with formal structures to maximize recycling efforts.

Moving Forward

To establish a robust, inclusive plastic waste management system in Vietnam and beyond, addressing these key areas is essential:

- **Implementing Extended Producer Responsibility (EPR) Policies:** Enforcing EPR policies incentivizes producers to take responsibility for managing plastic waste after its use. This could involve financial or operational obligations that encourage producers to design products for recyclability and invest in recycling infrastructure while supporting responsible and equitable collection schemes.
- **Formalizing the Informal Sector:** Integrating IWWs into the formal plastic waste management system allows the system to leverage their expertise and improve overall efficiency. This integration fosters a collaborative approach to plastic waste management that benefits both IWWs and the environment.
- **Developing Solutions for Low-Value Plastics:** Investing in research and development of solutions for recycling low-value plastic waste is crucial to reduce its environmental impact.

This could involve exploring innovative technologies or creating markets for recycled low-value plastics.

By addressing these challenges and opportunities, Vietnam and other Southeast Asian countries can establish a sustainable and effective plastic waste recycling system that promotes environmental responsibility and economic opportunities for all stakeholders involved.



INNOVATION IN ACTION: CLOSING THE WASTE GAPS



BRIDGING THE GAPS WITH INNOVATION

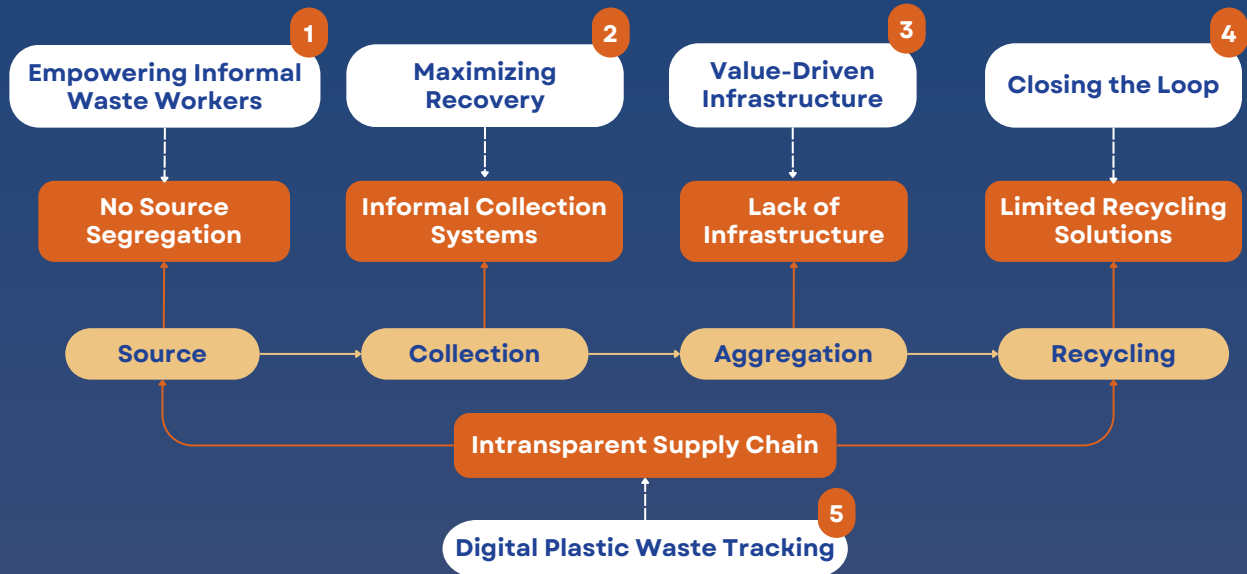


Figure 5: The solution to solve the gap in Plastic Waste Supply Chain in Vietnam

For the past eight years, Evergreen Labs has been at the forefront of tackling these critical challenges – the fragmented plastic waste landscape dominated by the informal sector. We've gone beyond mere collection. Through a comprehensive suite of solutions and initiatives, we have tested various strategies and interventions to bridge the gaps in the plastic waste supply chain through collaborative efforts with the IWW community:

1

Empowering Informal Waste Workers

Bridging the Gap Between IWWs and Formal Waste Management

Providing resources, training, and market connections to enhance livelihoods of IWWs while improving overall waste collection efficiency.

2

Maximizing Recovery

Building Comprehensive Connections to Enhance Waste Collection Capabilities

Connecting businesses to our affiliate program and establishing an efficient source-based collection system that collaborates with informal waste workers to maximize recovery.

3

Value-Driven Infrastructure

Optimizing Waste Management for Higher Material Value and Transparency

Implementing innovative strategies to efficiently sort, pre-process, and aggregate all materials and plastic types, partnering with informal waste pickers for effective collection and creating transparent, value-maximizing supply chains.

4

Closing the Loop

Upcycling All Plastics for a Cleaner, Less Polluted Future

Tackling all plastic types through local innovation, empowering informal workers and creating valuable new materials and products.

5

Digital Plastic Waste Tracking

Digital Tool for Efficient Waste Management and Transparency

Creating digital tracking tool to monitor plastic waste throughout the supply chain, ensuring fairness, preventing environmental leakage, and enabling efficient, transparent waste management practices.

EMPOWERING INFORMAL WASTE WORKERS

Bridging the Gap Between IWWs and Formal Waste Management

Formalization intervention 1



The Collector Network
Powered by ReForm Plastic

Introduction

Informal waste collectors (IWWs) play a crucial yet often overlooked role in urban waste management, significantly reducing the burden on landfills and generating cost savings for cities. Despite their essential function, IWWs frequently operate without proper recognition, support, or safety measures.

Evergreen Labs identified critical gaps in the waste management ecosystem:

1. Lack of structure and support for IWWs
2. Insufficient health and safety measures for waste collectors
3. Limited recognition of IWWs' contributions by authorities and the public
4. Absence of a coordinated system to maximize the efficiency of waste collection and recycling

Recognizing these challenges, Evergreen Labs developed The Collector Network as a targeted intervention to address these gaps and empower IWWs. This initiative aims to create a more inclusive, efficient, and sustainable waste management system by focusing on the needs of those at the frontline of waste collection.

The Collector Network serves as a community hub, offering tailored programs that provide essential resources for health, safety, and livelihood improvement. By highlighting the significant impact of IWWs' work and advocating for their rights and well-being, the network ensures these unsung heroes receive the recognition and support they deserve.

Highlights to date

- Over 1,400 IWWs have joined as TCN members
- Conducted 17 Occupational Safety and Health events and 6 free Medical Check-ups
- 38% of IWWs participated in OSH events
- 24% of IWWs received free medical check-ups
- 50 IWWs were provided with Health Insurance
- 30 IWWs were featured on The Collector Network page to increase their recognition
- 17 IWWs were connected to business collection programs to increase their income

BENEFITS FOR THE INFORMAL WASTE SECTOR



WORKERS' SAFETY

Trainings and PPE to ensure the safety of collectors



HEALTHCARE ACCESS

Working with partners to provide access to basic healthcare services



INCREASE COLLECTION

Building better collection schemes to increase the collectors' income



ONE VOICE

Providing a platform for discussion to governments & other organizations



KNOWLEDGE HUB

Providing access to resources and information



ADDITIONAL SUPPORT

Offering unique support such as retail discounts, etc



AWARENESS RAISING

Communicating about our members' lives increases awareness about this group



RECOGNITION

Erasing the stigma associated with this vulnerable group

Intervention challenges:



FUNDING OBSTACLES TO SUPPORT LONG-TERM EFFORTS

The Collector Network, as a non-profit network, struggles to secure sponsors due to limited public awareness of IWWs and their needs. This hinders support for vital initiatives like health training and free medical exams for IWWs.



BUILDING TRUSTED RELATIONSHIPS REQUIRES PARTNERSHIPS

Integrating IWWs requires overcoming existing trust issues. Local government engagement is crucial for successful recruitment.



LIMITED INFORMATION AND LACK OF TRANSPARENCY

Limited transparency from local authorities regarding IWW database and information hinders their connection with The Collector Network. Collaboration is needed to improve access in these areas.



TIME-CONSUMING EFFORTS IN IWW OUTREACH:

Despite established connections, locating and verifying IWW information is time-consuming. Multiple checks (phone numbers, addresses, IWW status) are needed, requiring persistence in outreach efforts.

Lessons learned

01 Establishing a Robust Network:

The successful implementation of any operational options for informal waste collectors (IWWs) and stakeholders hinges on the creation of a well-defined networking mechanism from the outset. This network fosters communication and collaboration between various actors throughout the waste management process.

02 Constructive Communication:

When discussing IWWs, maintaining positive and respectful language is crucial. Avoiding negative terminology promotes a more inclusive and productive dialogue with all involved parties. This positive approach is essential when building relationships with IWWs, public authorities, organizations, businesses, households, and individuals.

03 Transparency and Collaboration:

Engaging with all stakeholders necessitates transparency and careful consideration. Public agencies can be valuable partners in reaching IWWs across all regions of Vietnam, particularly when organizing events or conducting surveys.

04 Building a Comprehensive Database:

Constructing a detailed database of IWWs requires a comprehensive understanding of their daily lives and working environments. This data collection should be meticulous, with regular reviews and comparisons to ensure accuracy and reliability. Employing a data cross-checking process prior to inputting information into the database minimizes duplication, errors, and inaccuracies. Ensuring this database is kept confidential is also crucial.

What's next?

Informal Waste Workers (IWWs) are key contributors to a greener future, yet they face harsh conditions and limited recognition. The Collector Network is making a difference, but to create lasting change, we need to scale our efforts.

We're seeking partnerships to expand our impact within Vietnam and beyond:

- **Regional Expansion:** Replicate our model in other Vietnamese provinces
- **Cross-Border Collaboration:** Share best practices with organizations in neighboring countries
- **Corporate Partnerships:** Engage businesses in meaningful CSR initiatives
- **Government Cooperation:** Integrate IWWs into formal waste management systems
- **Technology Partners:** Develop innovative solutions for IWWs

How you can support:

- **Donate** towards health and safety training, medical care, and protective equipment for IWWs
- **Raise awareness** about IWWs' pivotal role in sustainability
- **Volunteer** your skills and time with our initiatives
- **Advocate for IWWs** by urging local government collaboration

By expanding our network, we aim to provide more IWWs with essential support, implement successful programs in new regions, and advocate more effectively for their rights.

Join us in scaling The Collector Network's impact. Together, we can create a sustainable future while ensuring IWWs receive the support and recognition they deserve.

Partnerships



MAXIMIZING RECOVERY

Building Comprehensive Connections to Enhance Waste Collection Capabilities

Formalization intervention 2

Introduction

In our ongoing efforts to revolutionize waste management, Evergreen Labs has developed another innovative intervention that bridges the gap between formal businesses and the informal waste sector. This initiative not only addresses critical inefficiencies in the current system but also creates a win-win scenario for all stakeholders involved.

Evergreen Labs identified several critical gaps in the waste management ecosystem particularly at the collection stage:

1. Lack of efficient source segregation in businesses
2. Limited collaboration between businesses and informal waste workers
3. Inadequate waste tracking systems
4. Untapped potential for increasing IWWs' income and professional development

To address these challenges, Evergreen Labs launched an innovative program fostering partnerships between IWWs, businesses, and The Collector Network. This initiative aims to enhance waste segregation at source, implement comprehensive waste tracking, and empower IWWs.

BENEFITS FOR THE INFORMAL WASTE SECTOR



INCOME STABILITY AND GROWTH

Steady supply of recyclables from businesses leads to more predictable and higher income for IWWs.



PROFESSIONAL DEVELOPMENT AND RECOGNITION

Training and formalized roles elevate IWWs' status and skills in the waste management sector.

Program Implementation

The program connects businesses with informal waste workers (IWWs) from The Collector Network. IWWs collect recyclables and maintain clean waste storage. This partnership improves waste management for businesses while providing IWWs stable income and growth opportunities.

Key features of the program include:

1. Business training in waste segregation
2. IWW monitoring of recyclable volumes (**Figure 6**)
3. "Track and Trace" management system
4. Efficient collection with stable IWW income

Highlights to date

Since its 2021 inception, the program has achieved significant milestones:

- 21 businesses across diverse sectors have joined (**Figure 7**)
- 18 connected IWWs have collected 97,837 kg of recyclable waste
- After Paper, Plastic is the second most generated waste - 31,019 kg (**Figure 8**)
- Participating IWWs have the potential to increase their income by **31.67%** compared to the average income of waste workers in Da Nang City

This intervention addresses waste management gaps while creating a more inclusive, efficient system benefiting businesses and informal waste workers alike. Through fostering collaboration and implementing robust tracking, Evergreen Labs advances sustainable, responsible waste management practices.

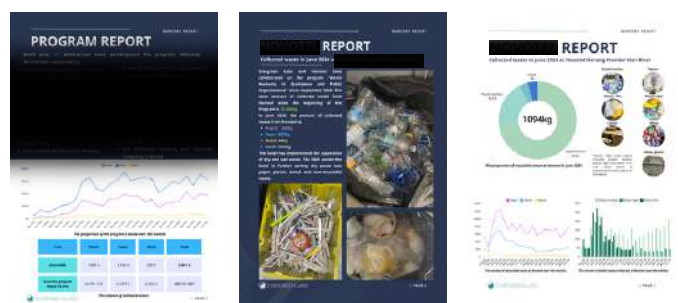


Figure 6: Example of Collection program reports provided to businesses

Figure 7: Businesses connected through the program

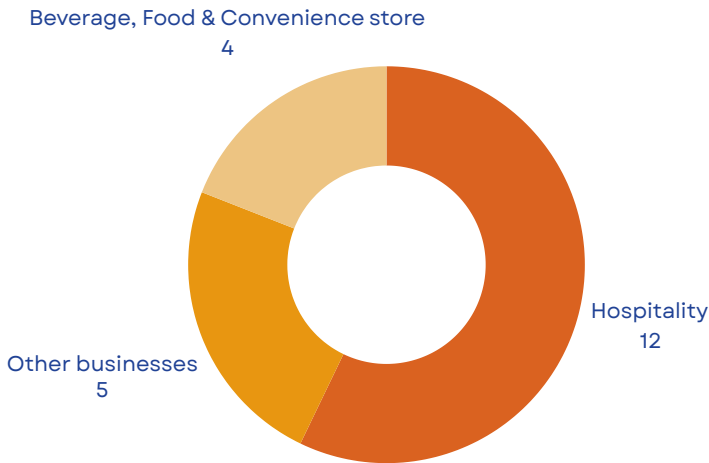
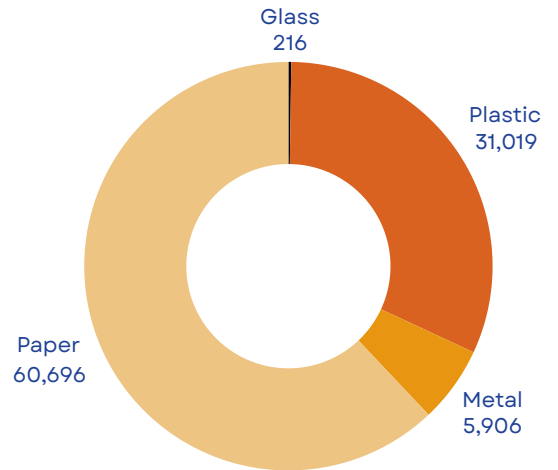


Figure 8: Recyclable Waste collected from business connection program (Kg)



Lesson Learned:

01 Sector-Specific Strategies Drive Success

The hospitality sector's dominance in recyclable waste collected underscores the importance of tailoring waste management approaches to high-volume generators. Daily collections for hospitality versus weekly for other sectors highlight the need for flexible, industry-specific solutions.

02 Robust Infrastructure is Essential for High-Volume Waste

The substantial waste output from the hospitality sector emphasizes the need for advanced sorting and processing facilities. This infrastructure is crucial for effectively managing large quantities of waste and supporting efficient recycling processes.

03 IWW-Business Partnerships Yield Mutual Benefits

Connecting IWWs with businesses, especially in high-waste sectors, creates sustainable relationships and improves overall waste management. These partnerships enhance income for waste workers, facilitate source separation, and significantly improve the efficiency of collection and sorting processes for recyclable materials.

Quotes from The Business Collection program members



"In the past, I had to pay a fee to collect resources from the hotel where I worked. However, since you connected with the hotel and convinced them, I am no longer required to pay any fees to collect those resources. Additionally, I am now aware that I should try to collect anything related to plastic and nylon bags." - Ms. Suong

"At first, the staff at this cafe didn't sort the trash at all, but after getting to know me, they started sorting it out more neatly. Although there has not been a thorough classification yet, progress has been made." - Ms. Bich



VALUE-DRIVEN INFRASTRUCTURE

Optimizing Waste Management for Higher Material Value and Transparency

Formalization intervention 3

Introduction

The waste management system is confronted with a complex challenge characterized by inadequate infrastructure for waste segregation at the source and aggregation for recycling. As a result, unsorted waste contributes to a mixed waste stream, diminishing the quality of recyclable materials, thereby creating inefficiencies and environmental repercussions downstream.

Evergreen Labs recognized the need for a comprehensive infrastructure solution that addresses the entire waste value chain. This intervention aims to transform the current fragmented system into an integrated, efficient, and transparent process that maximizes material recovery while incorporating both formal and informal sectors. By implementing facilities and innovative processes, Evergreen Labs seeks to create a model that not only improves waste management but also aligns with broader environmental goals and regulatory requirements.

Program Implementation

To address these challenges, we developed two comprehensive interventions to close to the gap for collection and pre-processing challenges in the supply chain.

Materials Recovery Facility (MRF):

- Receives sorted waste from residential and commercial sources

- Categorizes waste into high-value recyclables, low-value plastics, and organic waste
- Directly sells high-value recyclables to local collectors
- Processes all plastics to enhance recyclability

Master Aggregator (MA) Facility:

- Serves as a central sorting, pre-processing, and trade center for plastic waste
- Attracts recyclables from diverse sources, including informal collectors
- Ensures traceability and enables centralized monitoring
- Helps eradicate illicit recycling activities

These infrastructure improvements:

- Promotes appropriate waste separation at source
- Enhances citizen engagement and environmental stewardship
- Maximizes utilization of various plastic types, recyclables, and organic materials
- Integrates informal waste collectors into the formal system
- Aligns with new environmental regulations and EPR laws.

This comprehensive approach represents a significant step towards a more sustainable and efficient waste management system in Da Nang, addressing multiple challenges while creating environmental and economic benefits.



Highlights to date

- Reduced transportation costs and enhanced resource efficiency: **5,195 kg** of recyclable waste were collected from the MRFs in 5 month period (from 2021 December to 2022 April).
- Improved quality of recyclable materials
- Integration of informal waste collectors into the formal system: MA facility recruited **45 IWWs**
- Increased traceability and monitoring of waste management processes since December 2023 to July 2024
 - **1,234,744 kg** plastic waste MA receive
 - **1,051,235 kg** plastic waste delivered to recyclers



BENEFITS FOR THE INFORMAL WASTE SECTOR



EMPOWERMENT AND FORMALIZATION

The Master Aggregator facility empowers Informal Waste Workers by offering resource management roles and designated workspaces, facilitating their integration into the formal waste management sector and fostering a sense of ownership.



JOB CREATION POTENTIAL AND GROWTH

The Master Aggregator facility generates scalable employment opportunities for IWWs, fostering the development of a more professional and sustainable waste management sector.



INCREASED EARNING POTENTIAL

MRFs and the Master Aggregator create direct trading opportunities for Informal Waste Workers, potentially increasing their earnings through enhanced collection and sorting activities.



EFFECTIVE EXTRACTION

Streamlined waste collection and sorting processes maximize resource recovery while empowering IWWs. This system enhances circular economy efforts and provides stable employment opportunities.



ENHANCED SKILLS AND EFFICIENCY

The system offers IWWs training in efficient plastic waste collection, empowering them with valuable skills and streamlining the overall waste management process.



ACCESS TO ADVANCED TECHNOLOGY

The MRF and MA system provides IWWs with access to advanced sorting technology, enhancing their productivity and the value of their collected materials.

The Materials Recovery Facilities and Master Aggregator initiative boosts waste collection and segregation efficiency, enhancing the entire waste management ecosystem. This comprehensive approach improves operations and creates value for all stakeholders.

Intervention challenges:



OPTIMIZING THE INTEGRATION

Ensuring efficient MRF and MA operations and maintenance while minimizing disruption to IWW livelihoods and community well-being. Additionally, it necessitates overcoming public misconceptions about the interventions, often confused with poorly managed waste collection points.



GOVERNMENT COLLABORATION

Securing suitable locations and long-term operation permits through government collaboration presents complex challenges, requiring extensive dialogue to align objectives.



TRAINING SHORTFALLS

The limited training and awareness initiatives available to IWWs. Without proper training, IWWs may not understand the importance of accurately measuring waste volumes or may not have the knowledge and skills needed to do so effectively.



STANDARDIZATION GAP IN WASTE MEASUREMENT

The waste management system lacks standardized procedures and tools for volume measurement. This, combined with informal waste workers' unfamiliarity with such measures, leads to inconsistent data collection. Consequently, accurate reporting is hindered, impacting regulatory compliance and operational efficiency.

Lessons learned

01 Sustainable IWW Integration:

Strategic selection with skills assessment and training alongside community-based recruitment fosters long-term engagement with IWWs. Assigning dedicated IWWs for cleaning ensures a hygienic and efficient MRF/MA environment, solidifying the IWW's role in a sustainable waste management system.

02 Collaborative Partnerships for Success:

Establishing strong relationships with local authorities fosters smoother interactions with residents and supports overall MRF management and MA operation. This highlights the importance of strategic alliances between waste management projects and local authorities for operational success and community integration.

03 Streamlined Operations and Transparency:

Master Aggregators require a dedicated operations manager to meticulously oversee and document plastic waste inflow and outflow. This ensures efficiency, transparency, and allows for workflow optimization through implemented measures.

04 Formalization and Legitimization:

Integrating informal waste collection facilities with a centralized, officially certified facility is essential. This connection allows for proper documentation and legitimate authorization of export documentation for recyclable materials.

NG AREA
U VỰC
N LOẠI



CLOSING THE LOOP

Upcycling All Plastics for a Cleaner, Less Polluted Future

Formalization intervention 4



Introduction

In its mission to create comprehensive waste management solutions, Evergreen Labs continued down the supply chain and identified critical gaps in the recycling ecosystem, particularly concerning low-value plastics:

1. Economic challenges in recycling low-value plastics due to limited market value and high operational costs.
2. Lack of inclusive recycling systems that integrate informal waste workers.
3. Inefficient sorting and cleaning processes that hinder recycling efforts.
4. Limited local solutions for plastic waste, leading to transportation and logistical issues.

To address these challenges, Evergreen Labs developed ReForm Plastic, an innovative social venture with associated technologies specifically designed to tackle low-value plastics.

ReForm Plastic offers innovative and affordable upcycling technologies designed to tackle hard-to-process plastics. With a portfolio of solutions addressing all hard-to-manage plastic streams, ReForm Plastic transforms these materials into versatile, durable products for various sectors, including construction and furniture.

Operating on a social franchise model, the enterprise empowers local entrepreneurs while removing unusable waste from the environment. ReForm Plastic's approach not only solves technical challenges but also creates a socially inclusive and economically viable model for plastic waste management.

ReForm Plastic's approach includes:

1. Innovative Technology:

- Low investment cost per ton of processed material
- Capability to use mixed and uncleaned feedstock, reducing sorting and cleaning needs.

2. Inclusive Sourcing:

- Partnerships with material recovery facilities and informal sector collectors
- Expansion of income opportunities for informal waste workers by accepting previously worthless materials.

3. Decentralized Model:

- Addresses separation, collection, and transport limitations
- Localized processing reduces logistical challenges.

4. Value-Added Production:

- Creation of base and finished products for construction and furniture industries
- Demonstrates market potential for recycled low-value plastics.

Highlights to date

- Makes low-value plastic recycling **economically viable and scalable**
- **Empowers local entrepreneurs** through a social franchise model, with **14 factories** operating across South Asia and Africa
- Supports over **10,000 informal collectors** throughout its franchise network through employment and trading
- Up to **50% less environmental footprint** compared to RDF technologies*
- Processed **over 1000 tons** of low-value plastics into new materials.

BENEFITS FOR THE INFORMAL WASTE SECTOR



EXPANDING INCOME

ReForm Plastic's solution expands the range of available resources for IWWs with low-value and no-value plastic waste, consequently increasing their income.



EMPLOYMENT OPPORTUNITIES

Hiring and mobilizing the informal waste sector to operate the re-sorting and transportation of segregated materials.

**Based on third party life cycle assessment*

Intervention challenges:



INCONSISTENT SUPPLY AND QUALITY CONTROL:

Informal waste collectors often work independently and sporadically, which can lead to unpredictable supply volumes and varying quality of collected materials. ReForm Plastic struggles to maintain a steady input of non-recyclable plastics, potentially affecting their production schedules and product quality.



HEALTH AND SAFETY CONCERNS:

Informal waste workers often operate without proper safety equipment or training, exposing themselves to health risks. ReForm Plastic faces the challenge of implementing adequate health and safety measures, providing necessary training and equipment, and ensuring compliance with these standards without alienating workers accustomed to less structured environments.



FORMALIZATION AND LEGAL COMPLIANCE:

Integrating informal workers into a formal business structure involves navigating complex legal and regulatory requirements. ReForm Plastic must address issues such as worker registration, tax compliance, and social security contributions. This process can be time-consuming, costly, and may face resistance from workers who are used to the flexibility of informal work arrangements.

Lessons learned

01 Building Trust Takes Time

Establishing strong relationships with informal waste workers is crucial. ReForm Plastic has learned that consistent engagement, transparent communication, and demonstrating long-term commitment are essential in gaining the trust and cooperation of the informal sector.

02 Flexible Integration Models Work Best

A one-size-fits-all approach doesn't work when integrating informal workers. ReForm Plastic has found success in offering various levels of integration, from loose partnerships to full employment, allowing workers to choose their level of involvement based on their needs and preferences.

03 Education and Training are Invaluable

Investing in education and skills training for informal workers not only improves the quality and consistency of collected materials but also empowers workers and increases their earning potential. This investment has proven to be mutually beneficial for both the workers and ReForm Plastic.

04 Leveraging Local Knowledge is Crucial

Informal waste workers possess invaluable knowledge about local waste streams and collection routes. ReForm Plastic has learned to tap into this expertise, involving workers in planning and decision-making processes to optimize collection strategies and improve overall efficiency.

05 Gradual Formalization is More Effective

Attempting to formalize informal workers too quickly can be counterproductive. A phased approach, gradually introducing formal practices while maintaining some flexibility, has been more successful in retaining workers and ensuring a smooth transition.

DIGITAL PLASTIC WASTE TRACKING

Digital Tool for Efficient Waste Management and Transparency

Formalization intervention 5

Introduction

Establishing a comprehensive waste management system capable of recycling all plastic types, from high-value to low-value and even no-value plastics, necessitates a robust traceability system. Tracking plastic waste from its origin through collection, sorting, concentration, and ultimately, recycling is paramount.

The plastic waste recycling supply chain involves numerous stakeholders, encompassing the informal waste sector, private and public agencies, and certified recyclers. Implementing Extended Producer Responsibility (EPR) programs, coupled with the recycling demands of manufacturers, underscores the need for a clear, comprehensive recording process for the volume of plastic waste collected and recycled.

A plastic waste traceability system serves a two-fold purpose: firstly, it meticulously records the volume of plastic waste throughout the supply chain. Secondly, the system utilizes specific tools and applications to identify all stakeholders involved, facilitating efficient monitoring.

Data acquired through the traceability system enables the clear allocation of responsibilities to relevant parties. This transparency ensures all stakeholders, including manufacturers, recyclers, private/public agencies, and the informal waste sector, understand their specific roles in plastic waste recycling. Moreover, by identifying the origin of plastic waste, the system streamlines the supply chain, allowing all stakeholders to benefit from plastic credits. These credits can offer support for costs associated with purchasing collected plastic waste and bolster the income of informal waste workers involved in the collection process.

BENEFITS FOR THE INFORMAL WASTE SECTOR



CREDIT INCENTIVES

Plastic credit incentives can serve as a financial instrument to augment the income of informal waste workers.



RESOURCE EXPANSION

Adding value to no-value plastics, and increase value for low-value plastics.



FORMALIZING IWWS

Empowers IWWS through plastic waste tracking, integrating them into the supply chain, and boosting income stability.

TRACKING FOR CHANGE: EXN'S INTEGRATED PLASTIC WASTE MANAGEMENT SOLUTION



Introduction

The Extended Resources Network (EXN) is a collaborative consortium of experts and organizations dedicated to empowering sustainability and excellence. EXN connects industry leaders in legal, auditing, and waste management fields, providing comprehensive support and fostering innovation across sectors.

Our network engineers a transparent, fair social plastic supply chain through digitalization and stakeholder collaboration, ensuring complete traceability and EPR compliance. EXN seamlessly integrates collectors, aggregators, diverters, and obligated enterprises, offering:

- Track-and-trace application overseeing waste from origin to diversion
- Equitable fee implementation and EPR/plastic credit sharing
- Optimal end-of-life processing to minimize environmental impact
- Technology solutions and digitalization of social plastic supply chains
- Integration and training for informal and municipal sectors
- Comprehensive support services including partnership facilitation, feasibility studies, and Packaging Recycling Organization (PRO)/ Obligated Enterprise (OE) program implementation
- Access to plastic credit certification, financial auditing, and legal compliance expertise

We formalize IWWs' activities in the plastic waste supply chain, enhancing their income stability and integration into waste management systems.

How does it work?

EXN empowers responsible plastic management through:

1. Track & Trace: Innovative app tracking plastic lifecycle
2. Incentivized Collection: Maximizing waste reduction through local collaborations
3. Sustainable Transport: Efficient, eco-friendly waste logistics
4. Prioritized Diversion: Creating jobs through innovative recycling/upcycling
5. Rigorous Certification: Validating plastic credits for proper waste management

Impact

EXN has established over 50 ground-up supply chains in the Philippines, linking informal collectors, local governments, collection centers, aggregators, and recyclers through transparent tracking systems. This network provides access to EPR credits while ensuring full traceability across the waste management process.

By closing financial supply chain gaps and providing in-depth situation analysis, EXN helps stakeholders achieve sustainability goals. As the backbone network connecting expertise across sectors, we're committed to fostering collaborative excellence and driving positive impact in EPR and waste management fields.

To learn more about the EXN's work get in touch with the Evergreen Labs team today.

WAVES OF CHANGE: EMPOWERING FISHERMEN IN THE FIGHT AGAINST OCEAN POLLUTION

Introduction

Ocean plastic pollution poses a critical environmental threat. To address this, Evergreen Labs has partnered with BlueSky, an ocean-focused plastic recycler in Vietnam, to revolutionize ocean waste collection and tracking.

This collaboration has developed a sophisticated recording system that tracks waste collection amounts, collectors, locations, and exchanges throughout the recycling process. The system empowers fishermen as a new category of Informal Waste Workers (IWWs), creating sustainable livelihoods while tackling ocean pollution.

How It Works:

1. Collection: Fishermen collect plastic waste from the ocean.
2. Aggregation: Waste is brought to collection points in fishing ports for sorting.
3. Recycling: BlueSky purchases the sorted waste for recycling.
4. Tracking: The recording system logs each stage, from collection to recycling.
5. Compliance: Detailed records ensure EPR policy compliance.
6. Financial Support: The system creates new income opportunities for coastal communities.

Impact:

As of December 2023, BlueSky has collected an impressive 78,369 Kg of ocean-bound plastic waste. The comprehensive records provide detailed information on collectors, locations, and plastic types, enabling superior tracking and management of ocean plastic waste.

This initiative not only addresses marine pollution but also:

- Empowers fishermen as key players in the waste management ecosystem
- Integrates plastic recyclers like BlueSky into the EPR-compliant supply chain
- Promotes sustainable livelihoods in coastal areas
- Provides a replicable model for ocean-bound plastic recovery

By transforming fishermen into ocean stewards, this project demonstrates the power of innovative partnerships in creating environmental and social impact.

Intervention challenges:



DIGITAL LITERACY BARRIERS

Many informal waste workers may have limited exposure to digital technology, leading to difficulties in adopting and effectively using digital track and trace tools. This can result in errors in data entry, reluctance to use the technology, or complete avoidance of the tools, potentially compromising the accuracy and completeness of the tracking system.



ACCESS TO TECHNOLOGY AND CONNECTIVITY

Informal workers often operate in areas with limited internet connectivity and may not have access to smartphones or other necessary devices. This lack of infrastructure and hardware can create significant obstacles in implementing a comprehensive digital tracking system, leading to gaps in data collection and real-time monitoring.



PRIVACY CONCERNS AND TRUST ISSUES

The introduction of digital tracking tools may raise concerns among informal workers about privacy and surveillance. Workers might fear that the data collected could be used against them, potentially leading to loss of income or autonomy. This mistrust can result in resistance to adopting the technology or providing accurate information, undermining the effectiveness of the track and trace system.

Lessons learned

01 Simplicity is Key

Designing user-friendly, intuitive interfaces for digital tools has proven crucial. Successful implementations have focused on simple, icon-based applications that require minimal text input and can be easily understood regardless of literacy levels. This approach has significantly increased adoption rates and accuracy of data entry among informal workers.

02 Phased Implementation Yields Better Results

Introducing traceability systems gradually, starting with basic features and slowly adding complexity, has been more effective than attempting full-scale implementation at once. This approach allows informal workers to build confidence with the technology over time, reducing resistance and improving long-term adoption rates.

03 Incentivizing Participation Drives Adoption

Linking the use of digital traceability tools to tangible benefits for workers has been a game-changer. Successful programs have incorporated incentives such as faster payments, bonus structures for consistent use, or access to additional work opportunities. This has helped workers see the direct value of participating in the digital system.

04 Peer-to-Peer Learning Enhances Uptake

Leveraging the community aspect of informal waste networks has proven effective in spreading digital literacy. Identifying and training "digital champions" within the informal sector to support their peers has led to more organic adoption of traceability tools. This peer-to-peer approach helps overcome trust issues and allows for culturally sensitive training and troubleshooting.





RECOMMENDATIONS



After implementing strategic integration models with the informal sector, Evergreen Labs has identified several key areas for further improvement and development. Building on our successful initiatives and the valuable lessons learned, we share the following recommendations to enhance the efficiency and inclusivity of waste management systems, ensuring sustainable progress and better livelihoods for informal sector.

01 Enhance Collaboration and Partnerships

- **Government and Local Authorities:** Develop policies that support the formalization of informal waste workers (IWWs) and incentivize proper waste segregation at the source.
- **Private Sector:** Invest in innovative recycling technologies and infrastructure, and create job opportunities for formalized waste workers.
- **NGOs:** Continue capacity-building programs for both IWWs and government bodies, and act as intermediaries to foster collaboration.
- **Academic Institutions:** Conduct research on effective formalization strategies and provide evidence-based recommendations to policymakers.

02 Implement Comprehensive Training Programs

- Develop and deliver training programs focusing on safety, waste segregation, and efficient collection practices for IWWs.
- Provide ongoing education and support to improve digital literacy and the adoption of tracking technologies among IWWs.

03 Promote Policy and Regulatory Support

- Implement and enforce Extended Producer Responsibility (EPR) schemes to hold producers accountable for the lifecycle of their products.
- Create supportive legal frameworks that facilitate the integration of IWWs into formal waste management systems including overcoming administrative challenges.

04 Strengthen Infrastructure and Technology

- Establish more Materials Recovery Facilities (MRFs) and Master Aggregator (MA) facilities to improve waste sorting and processing capabilities.
- Invest in digital tools for efficient waste tracking and transparency throughout the supply chain.

05 Enhance Community Engagement and Awareness

- Conduct awareness campaigns to educate the public on the importance of proper waste segregation and the role of IWWs.
- Foster community involvement in waste management initiatives to ensure sustainable practices and local support.

06 Provide Financial and Health Support

- Establish financial mechanisms such as plastic credit incentives to boost the income of IWWs.
- Ensure access to healthcare services and protective gear to improve the safety and well-being of waste workers.



IDENTIFYING YOUR ROLE IN THE ECOSYSTEM AND MAXIMIZING ENGAGEMENT

The formalization of the informal waste sector requires a coordinated effort from multiple stakeholders, each playing a crucial role in creating a sustainable and inclusive waste management system. Governments, private sector entities, NGOs, informal waste workers, and academic institutions must work together to implement effective strategies and practices. By enforcing environmental protection laws, investing in sustainable solutions, providing capacity-building programs, and adopting innovative technologies, these stakeholders can collectively drive the transition towards a formalized system. This collaboration not only enhances the efficiency of waste management but also improves the livelihoods of informal waste workers, fostering a circular economy that benefits all parties involved.

GOVERNMENT (NATIONAL AND LOCAL):

- Enforce Environmental Protection laws, ensuring source segregation of materials
- Implement and monitor environmental compliance regulations for waste processing
- Develop policies promoting circular economy products and services
- Establish and manage EPR schemes, including taxation on plastic production and usage
- Create supportive legal frameworks for integrating informal workers into formal systems

PRIVATE SECTOR:

- Invest in and develop sustainable solutions for material separation and processing
- Design circular economy business models that are inclusive of informal sector workers
- Collaborate with government and NGOs to create job opportunities for formalized workers
- Implement EPR schemes and contribute to waste management infrastructure
- Provide fair wages and safe working conditions for formalized waste workers

NGOS AND NON-PROFIT ORGANIZATIONS:

- Offer capacity-building programs to government bodies on solid waste management
- Conduct awareness-raising campaigns for households on proper waste segregation
- Develop and implement support programs and training for informal workers
- Act as intermediaries between informal workers, government, and private sector
- Monitor and report on the social impacts of formalization efforts

ACADEMIC AND RESEARCH INSTITUTIONS:

- Conduct research on effective formalization strategies and their impacts
- Develop innovative technologies suitable for local contexts
- Provide evidence-based recommendations to policymakers
- Offer educational programs to build a skilled workforce in sustainable waste management





CONCLUSIONS

The integration of informal waste workers into the formal waste management sector in Southeast Asia presents a significant opportunity to enhance both environmental sustainability and social equity. This white paper highlights the critical role of IWWs in the waste management ecosystem and the innovative strategies implemented by Evergreen Labs to address the challenges they face.

By empowering IWWs through targeted interventions, providing essential training, and establishing robust waste management infrastructure, we can create a more efficient and inclusive system. The collaboration between government bodies, private sector entities, NGOs, and academic institutions is vital to ensure the success of these initiatives.

The key to achieving long-term sustainability lies in comprehensive stakeholder engagement, continuous improvement of waste management practices, and fostering a culture of responsibility and innovation. Evergreen Labs' initiatives demonstrate the potential to transform the informal waste sector into a driving force for a circular economy, ultimately benefiting both the environment and the communities involved.

In conclusion, the formalization of the informal waste sector is not only a viable solution for improving waste management but also a crucial step towards achieving social justice and economic empowerment for millions of waste workers. By building on the lessons learned and addressing the ongoing challenges, we can pave the way for a sustainable and inclusive future.



REFERENCES

- Baophapluat. (2024, February 11). Quy hoạch TP Đà Nẵng thời kỳ 2021 - 2030, tầm nhìn đến năm 2050: Mở ra những chương mới đầy triển vọng. Báo Pháp luật Việt Nam điện tử. <https://baophapluat.vn/bds/post-503466.html>
- Salhofer, S., Jandric, A., Soudachanh, S., Le Xuan, T., & Tran, T. D. (2021). Plastic Recycling Practices in Vietnam and Related Hazards for Health and the Environment. *International Journal of Environmental Research and Public Health*, 18(8), 4203. <https://doi.org/10.3390/ijerph18084203>
- Sonia Maria Dias & Ana Carolina Ogando. (2015). Rethinking gender and waste: Exploratory findings from participatory action research in Brazil. *Work Organisation, Labour and Globalisation*, 9(2). <https://doi.org/10.13169/workorglaboglob.9.2.0051>
- UNDP. (2020, September 7). A peek into the life of informal waste workers in Viet Nam during COVID-19. UNDP. <https://www.undp.org/vietnam/blog/peek-life-informal-waste-workers-viet-nam-during-covid-19>
- USAID. (2023, March 1). Empowering Informal Waste Workers. Urban Links. <https://urban-links.org/resource/empowering-informal-waste-workers/>
- WWF-Viet Nam. (2023). REPORT ON PLASTIC WASTE GENERATION IN 2022. Vietnam Panda. <https://vietnam.panda.org/en/?382295/Bao-cao-tinh-hinh-phat-sinh-cht-thi-nha-nm-2022>

If you are interested in engaging with the informal sector or improving your impact within please get in touch and we would be happy to share more learning or collaborate for a more sustainable future!



EVERGREEN LABSTM

BE PART OF THE CHANGE

Contact our team to explore how:



68 Circular Road #02-01
Singapore 049422



Vietnam +84 236 3912 686

Philippines +63 917 5065 552



info@evergreenlabs.org



www.evergreenlabs.org