

PROJECT REPORT

APRIL 2023



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DEFINITIONS

Formalization

- 01.** The process of bringing informal workers and economic units under the coverage of formal arrangements, while ensuring opportunities for income security, livelihoods, and entrepreneurship.

Source: International Labour Organization | Formalization of the informal economy: Area of critical importance

Inclusion

- 02.** The process of improving the terms on which individuals and groups take part in society improving the ability, opportunity, and dignity of those disadvantaged based on their identity.

Source: As per World Bank the term "Inclusion" is defined as 'Social Inclusion'.

Plastic waste processors

- 03.** Recyclers of plastic waste as well as entities engaged in using plastic for energy (waste to energy) including in co-processing or converting plastic waste to oil (waste to oil).

Source: Rule 3(qb) of Plastic Waste Management Rules, 2016

Resource recovery

- 04.** Resource recovery is part of a circular economy, in which the extraction of natural resources and generation of wastes are minimized.

Source: A pathway to a circular economy: Journal of Cleaner Production

Bulk waste generator

- 05.** Includes buildings like hospitals, nursing homes, schools, colleges, universities, and other educational institutions, having an average waste generation rate exceeding 100kg per day.

Source: Rule 3(8) of Solid Waste Management Rules, 2016

- 06.** Low-value plastic

Flexible plastics also referred to as low-value or hard-to-recycle plastics like packaging films or bags.



Waste picker colony in Seemapuri , Delhi

*"In 2018-19, India estimated the death of at least one sanitation worker every five days."**

In 2019, SZW first set out a social inclusion pilot project to transition the Informal Waste Worker (IWW) towards the formal waste ecosystem. Our core intention is to leverage the innate entrepreneurial qualities of the waste worker and establish a self-sustaining business model which ensures environmental and social compliance.

SZW partnered with Alliance to End Plastic Waste in March 2022 for recovering and recycling of Low-Value Plastic (LVP) in four different locations (Bangalore, Delhi, Kochi, Pandhurna) through the Social Inclusion Model. The project will enable an ethical supply chain for maximum resource recovery of LVP plastic from landfills and water bodies.

The plastic waste collected as part of this project will be tracked on a digital traceability tool, TRACER, which is designed to track the end-to-end movement of plastic waste, hence providing transparency and access to data.

*Reference: Times of India - Plight of frontline sanitation workers



Zabiulla's facility in Bangalore before project intervention in May 2022

Social Inclusion (SI), as defined by the World Bank is:

*“the process of improving the terms on which individuals and groups take part in society—improving the ability, opportunity, and dignity of those disadvantaged based on their identity.”**

Social inclusion is vital to transform the current linear plastics system, in India, into a circular plastics economy. Currently, informal systems exist at different levels and scales which has to be considered as the starting point for building more inclusive systems.

Social inclusion activities start with the selection of a project entrepreneur. This is done by completing a baseline survey to understand where interventions are required. One-time infrastructure support is provided to ensure safe and clean working conditions. Capacity building is carried out to ensure that the entrepreneurs are trained to maintain compliance and understand the benefits of an ethical business model. The next step is to make sure that the entrepreneur has a profitable and sustainable business.

01. Diversion of plastic waste

Diversion of **3,573 MT** of plastic waste from selected areas in four Indian cities (Bangalore, Delhi, Kochi, Pandhurna) to waste-to-energy processing plants and cement companies for co-processing

02. Inclusion of the workforce

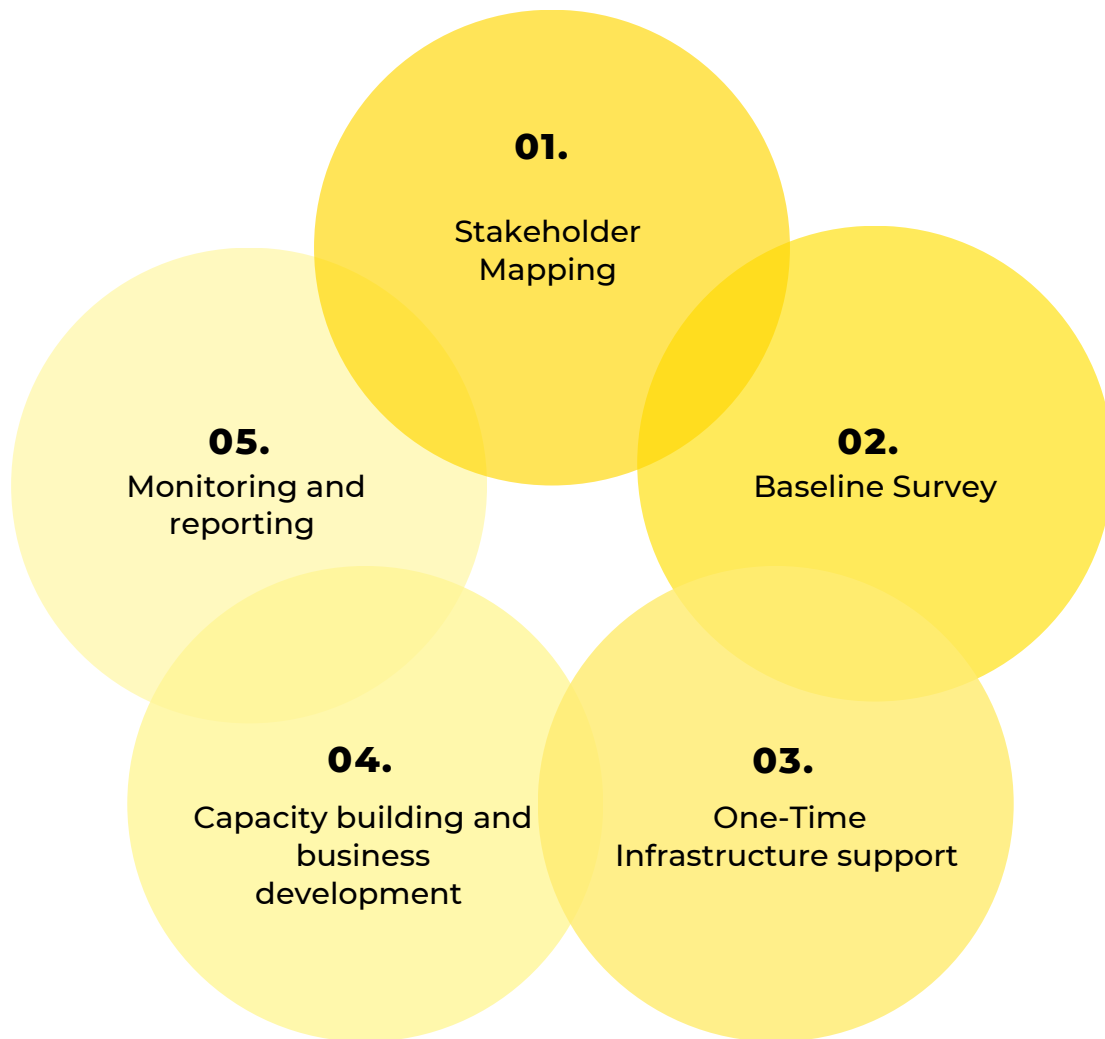
Onboarding and facilitating at least **20 waste workers** for compliant operation across 4 cities of operations

03. Traceability of supply chain

Using digital platform **TRACER** to demonstrate reverse logistics through proof of execution documentation.

A typical informal workspace





01. Stakeholder Mapping

Identification and mapping of the informal waste workers and their supply chain.

02. Baseline survey

To gather evidence on the identified project leader for better insights on their existing work practices, socio-economic status, and cost dynamics (revenue vs expenditure) in the value chain.

03. One-Time Infrastructure support

Financial support is provided to the entrepreneurs for compliant operation.

04. Capacity building and business development

Capacity-building activities such as training in bookkeeping, health and safety, Labour laws, and responsible waste management practices (material handling and resource recovery).

05. Monitoring and reporting

Introduce project leader to our traceability tool - TRACER, conduct regular monitoring and audits to ensure environmental and social compliance were maintained.

PROJECT LOCATION 1

DELHI



Streets of Seemapuri with workers sorting the waste during the day and transformed to a market place by the afternoon

PROJECT IMPLEMENTATION

INTRODUCTION

NAME Tajuddin
AGE 36
LOCATION Ghaziabad
EXPERIENCE 17 years
COMPANY NAME Taj traders



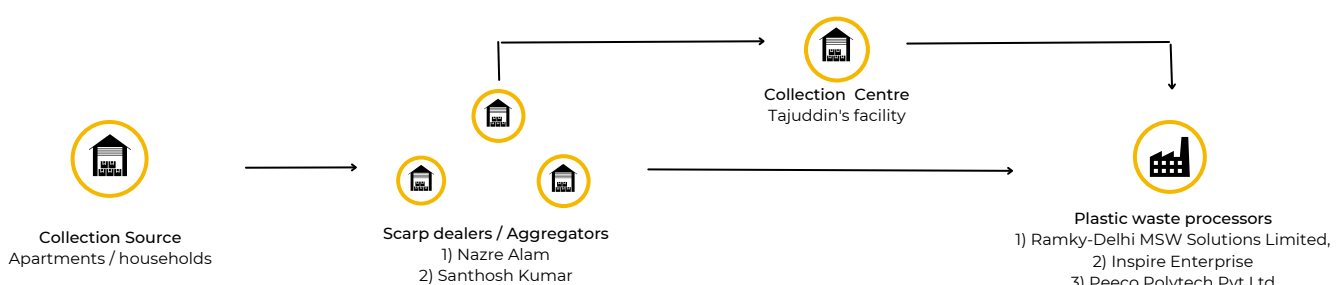
- Tajuddin started working in the waste sector at the age of 18 doing door to door collection.
- He managed his family owned collection center and handled waste from vendors all across Delhi.
- Having worked in a waste management agency for over 10 years, he is familiar with the operations in waste management.
- After quitting this job, he was ready to start something of his own.
- SZW started working in partnership with Tajuddin to establish a supply chain to recover Low Value Plastic(LVP) from the Municipal Corporation of Delhi (MCD) region.
- Through the project, Tajuddin got a one time support incentive to set up his facility in Ghaziabad.
- He has moved from doing door to door collection to operating a facility that manages 0.5MT of dry waste and has generated formal employment to 5 waste workers.



SIZE OF FACILITY	TYPE OF WASTE MANAGED	EMPLOYEES	SOURCE OF WASTE
4,500 sq ft	Dry waste	6 (5 female employees)	Scrap dealers/small aggregators, bulk waste generators

SUPPLY CHAIN

Waste from apartments and households are collected by aggregators in Kamruddin Nagar and Seempauri. The LVP-MLP is sent directly to the waste to energy plant. Other recyclables are taken to his facility and sorted. It is then sent to the plastic waste processors .



PROJECT IMPLEMENTATION

STAKEHOLDER MAPPING

COLLECTION SOURCES

Aggregator -1



Santhosh Kumar , based out of Kamruddin nagar , manages up to 30 MT of MLP-LVP per month and has 13 employees.

Aggregator -2



Nazre Alam , based out of Kamruddin Nagar , manages up to 40 MT of MLP - LVP per month and has 8 employees.

PROJECT IMPLEMENTATION

STAKEHOLDER MAPPING

COLLECTION SOURCES

Waste picker colony



20+ aggregators in Seemapuri supply material of various categories to Tajuddin.

PLASTIC WASTE PROCESSORS

Waste to Energy plant









Ramky Enviro Engineers Limited, Delhi

PROJECT IMPLEMENTATION INTERVENTIONS

The interventions were grouped into the three categories as follows :

Focus Area	Interventions
Infrastructure Development	<ol style="list-style-type: none"> 1. Support was provided to procure PPE, first aid kits, fire safety equipment, weighing scale, CCTV, signages, inverter, desktop and an e-rikshaw. 2. A conveyor was provided to increase efficiency of sorting
Capacity building	<ol style="list-style-type: none"> 1. EHS, book keeping, fire safety, and nutrition training was given to the entrepreneur and workers. 2. Health checkups were conducted for all the workers and the workers in the supply chain. 3. Partial support was given for the rent of the facility and the salary of the workers for 6 months. 4. Health insurance was given to all the employees. 5. Workers are paid through bank transfer rather than cash 6. Support with GST registration. 7. Training and usage of accounting tool (Zoho Books)
Business Development	<ol style="list-style-type: none"> 1. Empaneled with the Municipal Corporation of Delhi (MCD) to collect waste across Delhi 2. Waste management for events 3. A business development workshop was conducted

Trainings sessions conducted

Material handling training	Bookkeeping training	EHS Training	Fire Equipment and Training	Labour Law Training	Business development
					

PROJECT IMPLEMENTATION INTERVENTIONS



E rikshaw procured to ease collection of material



Health check up for all employees and employees part of the supply chain

Desktop and printer set up at the facility to digitalize operations



Fire safety equipment installed in facility



Nutritional training for all the employees



EHS and first aid training for all employees

Digital weighing scale



Conveyor was provided to increase efficiency of sorting



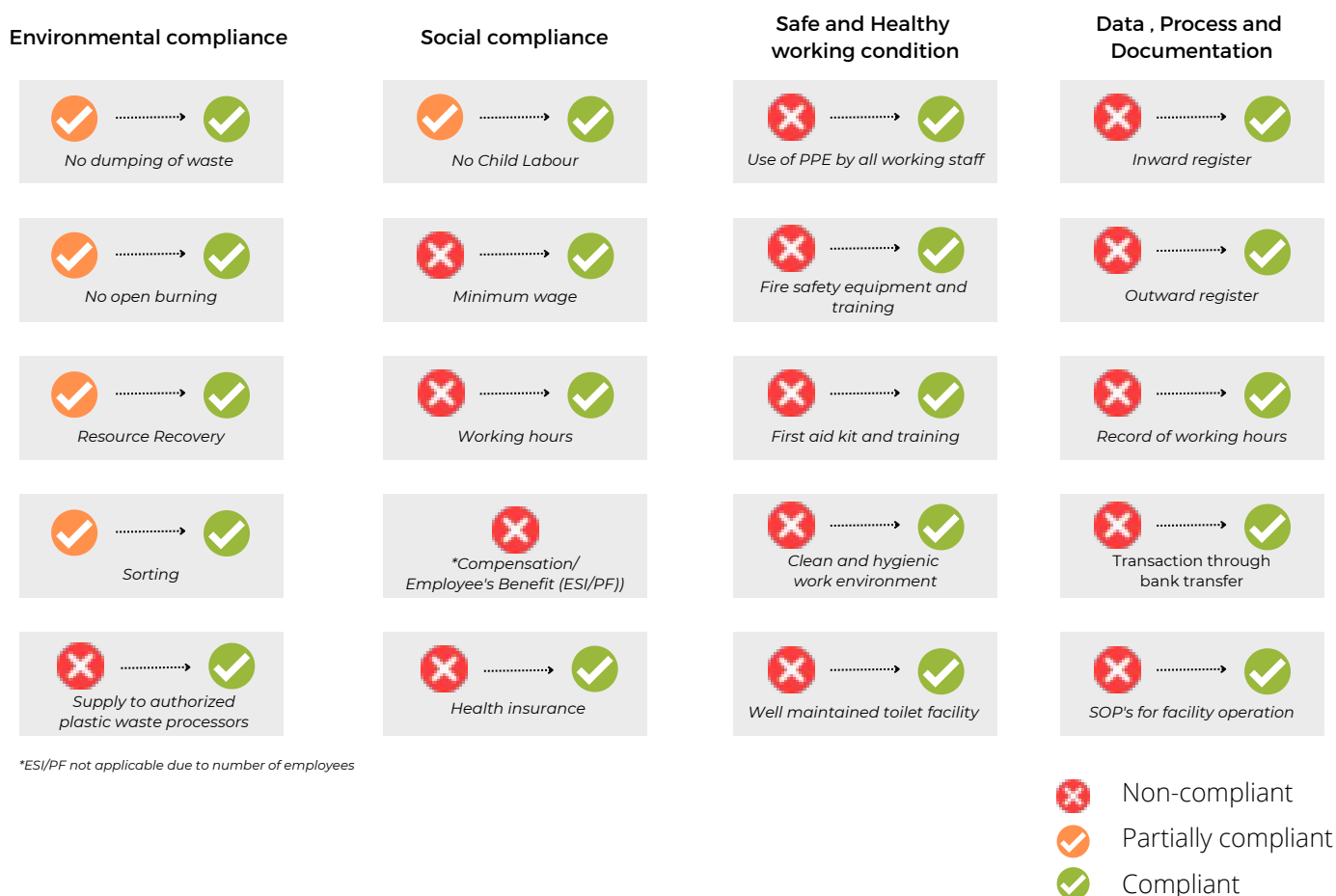
PROJECT IMPLEMENTATION INTERVENTIONS



PROJECT IMPLEMENTATION

MONITORING AND REPORTING

The baseline to midline progress is mapped as shown below



Environmental compliance: Weekly audits and EHS training ensured that dumping and open burning was eliminated from the facility. Technical feedback on sorting methodologies and waste categorisation to ensure maximum resource recovery. SZW helped streamline material to an authorized plastic waste processors ensuring resource recovery.

Social compliance: Weekly audits and labor law training was provided to avoid child labor in the facility. The workers were paid a fixed monthly salary with fixed working hours. Cash payments to workers was replaced with bank transactions. Health insurance was obtained for all the workers.

Safe and healthy working condition: Previously unaware of the importance of safe and hygienic working conditions, EHS training highlighted the importance of PPE, First aid, Hygienic work conditions and a well maintained toilet facility.

Data process and documentation: Bookkeeping training was given to the entrepreneur to start maintaining log books and registers. An SOP is now followed in the facility, which ensures that salary is paid through bank transfer and a record of the working hours is maintained.

PROJECT IMPLEMENTATION

MONITORING AND REPORTING

Key Social Inclusion Indicator		Baseline	Interventions	Outcome
Environmental Compliance	Dumping	Dumping was observed	Training given on environmental compliance	No dumping
	Resource recovery	No collection and sorting of low value plastic was found	Provide ethical sourcing surcharge for low value plastic.	Ethically sourced low value plastic
	Supply to authorized plastic waste processors	End destination was not known	Build connection with authorized plastic waste processors	Regular dispatches to Delhi WMS Solutions Ltd
Social Compliance	No child labour	No child labour was observed	Through weekly audit ensure, all employees are above 18 years of age.	No child labour was present
	Minimum wage	Employees paid Rs 10,000 per month	Promoting a fixed payment and regular follow ups	Employees are paid a fixed salary of Rs 13,500 per month
	Record of working hours	Not Maintained	Working hours are to be recorded in the attendance book	Fixed working hours of 9am to 6 pm are being recorded and maintained.
	Compensation/ Employee benefits	No ESI/PF provided	If more than 10 employees are present, support provided to help workers get ESI/PF	ESI/PF not applicable
	Health Insurance	No insurance provided	Support to be provided to for health insurance	E-shram health insurance for all the workers

PROJECT IMPLEMENTATION

MONITORING AND REPORTING

Key Social Inclusion Indicator		Baseline	Interventions	Outcome
Safe and Healthy working condition	Use of PPE by all working staff	No useage of PPE	Incentive given to purchase PPE (gloves, safety shoes and masks, uniform) First aid kit, Fire safety equipment.	Gloves, safety shoes , uniform and mask used by all employees
	Fire Safety Equipment and Training	No fire safety equipment and training		Facility is now equipped to handle fire accident if any. The employees are trained to use the fire extinguishers.
	First Aid Kit and Training	No first aid Kit and training		Employees are aware about basic first aid procedures.
	Clean and Hygienic work environment	Dirty work environment		Clean work environment maintained
	Well maintained toilet facility	No well maintained toilet facility		Well maintained and clean toilet facility
Data, Process and Documentation	Inward Record	No inward record maintained	Constant training provided on Book keeping and maintaining log records , Support provided to purchase hardware for data capturing	Inward register maintained, manually and digitally.
	Outward Record	No outward record maintained		Outward register maintained , manually and digitally
	Record of working hours	No record of working hours		Register maintained for attendance and working hours
	Transaction through Bank transfer	Cash transactions	Support provided on opening of bank account	Transactions are made through bank transfer
	SOPs for facility operation	No SOPs for operation	SOP to be framed for the operations	SOP installed and followed for the operation

PROJECT IMPLEMENTATION MONITORING AND REPORTING

The following table shows the recovery of low value plastic for each month of the project :

Month	Dispatch Quantity	Accepted Quantity	Plastic waste processors
May-22	47,460	47,380	<u>Ramky- Delhi WMS Solutions Limited</u>
June-22	45,867	46,360	
July-22	48,093	48,060	
August-22	49,331	48,690	
September-22	136,226	136,510	
October-22	207,057	206,570	
November-22	246,250	243,160	
December-22	196,737	195,540	
January-23	7,445	7,450	
February-23	-	-	
March-23	-	-	
Total	984,466	979,720	

PROJECT IMPLEMENTATION CHALLENGES AND LEARNING



Tajuddin and his workers in his new facility

1. Difficulty in finding a new facility

At the start of this project, SZW approached the Municipal Corporation of Delhi (MCD) seeking support for a facility for operating this project. However, this was not approved and it was difficult to establish a working partnership with the MCD (despite SZW being an empaneled partner). Alternatively, it also became challenging to find a suitable facility as per the project requirement. It took 3 months to locate and finalize an appropriate facility in Ghaziabad. There is a stigma for renting out facilities to operate waste management in most parts of the country.

2. Expanding sources of waste to service fee clients

While Tajuddin was primarily involved with trading waste, through this project he wanted to expand his operations to the processing of waste. Due to the competitive nature of waste management in Delhi, he struggled to build partnerships with bulk waste generators. Through business development activities, SZW plans to support Tajuddin to increase his source of waste (event management, collection drives, etc).

3. Open to change

One of the key learnings from this project was the positive mindset and behavioral change of the entrepreneur Tajuddin. He was forthcoming and embraced change. While he still has a journey ahead the change has been evidently quicker than in other instances. Having been part of the informal sector for almost 18 years, He has remained headstrong to not only operate a formal facility but educate the waste workers he is associated with and socially uplift them.

PROJECT LOCATION 2 PANDHURNA

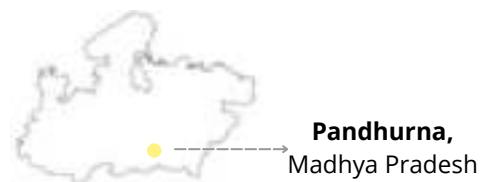


Pandurna dumping site with mixed waste (dry and wet) and leachate flowing while being pushed aside using earth mover equipment

PROJECT IMPLEMENTATION

INTRODUCTION

NAME Arun Shende
AGE 32
LOCATION Pandhurna
EXPERIENCE 3 years
COMPANY NAME Shende Resource Management



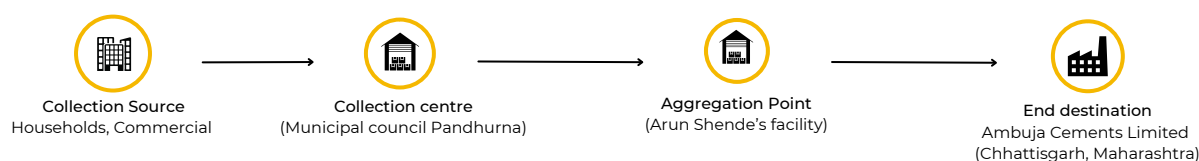
- Arun Shende, 32, has been working in the waste management sector for 3 years. Arun is an ex-SZW employee (field supervisor) who had a strong desire to become an entrepreneur.
- Arun is a first-generation entrepreneur and first in Pandhurna to set up a waste management facility.
- Not having an entrepreneurial background, Arun initially found it hard to operate his business
- SZW guided Arun through trainings to help him operate efficiently.
- Arun is looking forward to scaling his operations and has a vision to manage all the waste of Pandhurna and neighbouring local bodies.



SIZE OF FACILITY	TYPE OF WASTE MANAGED	EMPLOYEES	SOURCE OF WASTE
2500 sq ft	Mixed Plastics	7	Municipality & Scrap dealers

SUPPLY CHAIN

Waste from households and commercial locations is collected door to door and taken to Pandhurna municipality where the waste is dumped in a landfill. Arun shende's workers collect waste from the landfill and bring it back to the facility. The waste is then sorted and sent to the plastic waste processors .



PROJECT IMPLEMENTATION

STAKEHOLDER MAPPING

COLLECTION SOURCES

Municipal council Pandhurna



Arun Shende mainly sourced from Pandhurna Municipality where material is picked from the dump yard.

PLASTIC WASTE PROCESSORS

Co-processing plant









Ambuja Cement, Chandrapur

PROJECT IMPLEMENTATION INTERVENTIONS

The interventions were grouped into the three categories as follows :

Focus Area	Interventions
Infrastructure Development	<ol style="list-style-type: none"> 1.Support was provided to procure PPE, first aid kits, fire safety equipment, a sorting table, a manual baler, a weighing scale, CCTV, signages, a hand wash facility, and a laptop. 2.A hydraulic baler was provided to increase the capacity of storage and make transportation more efficient
Capacity building	<ol style="list-style-type: none"> 1.EHS, bookkeeping, fire safety and nutrition training was given to the entrepreneur and workers. 2.Health check ups were conducted for all the workers. 3.Partial support was given for rent of the facility salary of the workers and transportation. 4.Health insurance was given for all the employees. 5.Workers are paid through bank transfer rather than cash
Business Development	<ol style="list-style-type: none"> 1.Authorized to collect waste from Pandhurna Municipality 2.Awareness sessions to be planned to encourage source segregation 3.Business development workshop conducted

Training session conducted :

Material Handling training	Book keeping training	EHS Training	Fire Equipment and Training	Labour Law Training	Business development
					

PROJECT IMPLEMENTATION INTERVENTIONS



Weighing scale purchased



Fire safety training for all the employees



Sorting table installed in the facility



Fire safety equipment installed in facility



Laptop set up at the facility to digitalize documentation



Baler procured for increasing efficiency of storage and transportation



Health check up for all employee



EHS training for all employees



PROJECT IMPLEMENTATION INTERVENTIONS

Before




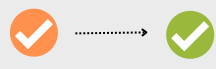
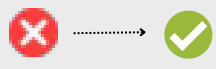



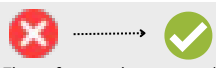





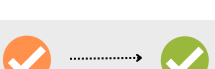

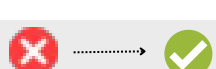



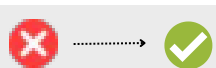

After






PROJECT IMPLEMENTATION

BASELINE TO MIDLINE PROGRESS

The baseline to midline progress is mapped as shown below

Environmental compliance	Social compliance	Safe and Healthy working condition	Data , Process and Documentation
 No dumping of waste	 No Child Labour	 Use of PPE by all working staff	 Inward register
 No open burning	 Minimum wage	 Fire safety equipment and training	 Outward register
 Resource Recovery	 Working hours	 First aid kit and training	 Record of working hours
 Sorting	 *Compensation/ Employee's Benefit (ESI/PF)	 Clean and hygienic work environment	 Transaction through bank transfer
 Supply to authorized plastic waste processors	 Health insurance	 Well maintained toilet facility	 SOP's for facility operation

*ESI/PF not applicable due to number of employees

-  Non-compliant
-  Partially compliant
-  Compliant

Environmental compliance: Weekly audits and EHS training ensured that dumping and open burning was eliminated from the facility. SZW helped streamline material to an authorized plastic waste processors ensuring resource recovery.

Social compliance: Weekly audits and labor law training ensured that there was no more child labor in the facility. Previously workers were paid in cash and had no fixed work hours. However, now workers are paid a fixed monthly salary and the working hours are fixed. It was also observed that there was no social security provided to the workers in their previous job. Health insurance was availed for all the workers during the project.

Safe and healthy working conditions: Previously unaware of the importance of safe and hygienic working conditions, EHS training highlighted the importance of PPE, First aid, Hygienic work conditions, and a hand wash facility.

Data process and documentation: Bookkeeping training was given to the entrepreneur to start maintaining log books and registers. An SOP is now followed in the facility, which ensures that salary is paid through bank transfer and a record of the working hours is maintained.

PROJECT IMPLEMENTATION

MONITORING AND REPORTING

Key Social Inclusion Indicator		Baseline	Interventions	Outcome
Environmental Compliance	Dumping	Dumping was observed	Training given on environmental compliance	No dumping
	Resource recovery	No collection and sorting of low value plastic was found	Provide ethical sourcing surcharge for low value plastic.	Ethically sourced low value plastic
	Supply to authorized plastic waste processors	End destination was not known	Build connection with authorized plastic waste processors	Regular dispatches to Ambuja Cements Limited (Chhattisgarh, Maharashtra)
Social Compliance	No child labour	No child labour was observed	Through weekly audit ensure, all employees are above 18 years of age.	No child labour was present
	Minimum wage	Employees paid minimum wages of Rs 8000	Promoting a fixed payment and regular follow ups	Employees are paid a fixed salary of 12300 per month
	Record of working hours	Not maintained	Working hours are to be recorded in the attendance book	Fixed working hours of 9am to 6 pm are being recorded and maintained.
	Compensation/ Employee benefits	No ESI/PF provided	If more than 10 employees are present , support provided to help workers get ESI/PF	ESI/PF not applicable
	Health Insurance	No insurance provided	Support to be provided to for health insurance	Ayushman health insurance for all the workers

PROJECT IMPLEMENTATION

MONITORING AND REPORTING

Key Social Inclusion Indicator		Baseline	Interventions	Outcome	
Safe and Healthy working condition	Use of PPE by all working staff	No useage of PPE	Incentive given to purchase PPE (gloves, safety shoes, hand wash facility, masks) first aid kit, fire safety equipment.	Gloves, safety shoes , uniform and mask used by all employees	
	Fire Safety Equipment and Training	No Fire Safety Equipment and training		Facility is now equipped to handle fire accident if any. The employees are trained to use the fire extinguishers.	
	First Aid Kit and Training	No First Aid Kit and Training		Employees are aware about basic first aid procedures.	
	Clean and Hygienic work environment	Dirty work environment		Clean work environment maintained	
	Well maintained toilet facility	No well maintained toilet facility		A hand wash facility was installed at the facility	
Data, Process and Documentation	Inward Record	No inward record maintained	Constant training provided on Bookkeeping and maintaing log records , Support provided to purchase hardware for data capturing	Inward register maintained, manually and digitally.	
	Outward Record	No outward record maintained		Outward register maintained , manually and digitally	
	Record of working hours	No record of working hours		Register maintained for attendance and working hours	
	Transaction through Bank transfer	Cash transactions		Support provided on opening of bank account	Transactions are made through bank transfer
	SOPs for facility operation	No SOPs for operation		SOP to be framed for the operations	SOP installed and followed for the operation

PROJECT IMPLEMENTATION MONITORING AND REPORTING

The following table shows the recovery of low value plastic for each month of the project :

Month	Dispatch Quantity	Accepted Quantity	Plastic waste processors
May-22	43,570	41,800	<u>Ambuja cement</u> <u>Maharashtra and</u> <u>Chhattisgarh</u>
June-22	51,450	50,580	
July-22	51,880	50,580	
August-22	83,650	82,550	
September-22	87,410	84,640	
October-22	133,130	131,100	
November-22	127,910	123,270	
December-22	153,265	150,440	
January-23	-	-	
February-23	-	-	
March-23	156,420	156,620	
Total	888,685	871,580	

PROJECT IMPLEMENTATION CHALLENGES AND LEARNING



Arun and his workers in his facility

1 . Lack of business acumen

Arun Shende is a first generation entrepreneur and also relatively new to the waste management industry. He initially struggled to understand how to sort, collect and transport the waste. After multiple training sessions and a few months of operations, he became proficient in the operations.

2 . Steady cashflows

Starting a business from scratch caused a lot of issues in terms of cashflows. He was heavily dependent on SZW for social inclusion incentive given to run his day to day operations. This is a continuous process and further interventions are being planned to make this aspect more self-sustained.

3 . Difficulty in expanding sources of waste

Pandhurna being a small town, has very limited sources of waste. He relies on the municipality to access waste. SZW continues to support Arun with increased access to more waste from the nearby local bodies.

4 . Open mindset of the entrepreneur

Being new to the space, Arun Shende had an open mindset and was ready to implement the changes suggested to him. The transition phase was quicker than the other projects and he is willing to extend his journey into holistic and responsible waste management.

PROJECT LOCATION 3 BANGALORE



Zabiulla's older facility, in a waste worker colony, where he operated out of a make shift shed with waste dumped all around the facility

PROJECT IMPLEMENTATION INTRODUCTION

NAME Zabiula
AGE 38
LOCATION Bangalore
EXPERIENCE 15 years
COMPANY NAME Ameena Enterprise



Bangalore, Karnataka

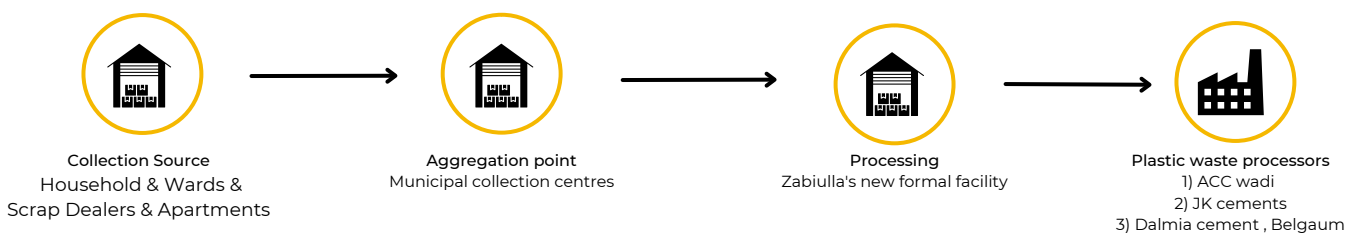
- Zabiulla, 38, is working in the field of waste management for more than 13 years. In the initial period, he was taking care of his family business.
- Later, he started his own business in Bangalore and he faced a lot of challenges while growing his business.
- He managed to overcome and gain a lot of knowledge from those challenges and hurdles.
- SZW supported him to set up his formal facility with industrial standards and provided capacity-building training.
- Despite being very resistive in the initial period, he acknowledged the benefits of a formal business and shifted towards compliant and efficient operations.



SIZE OF FACILITY	TYPE OF WASTE MANAGED	EMPLOYEES	SOURCE OF WASTE
1800 sq ft	Mixed Dry Waste	6	Households & Wards & Scrap dealers

SUPPLY CHAIN

Zabiulla majorly sources the materials from selective wards of south Bangalore along with direct collection from apartments, households and scrap dealers. He collects material from the Municipality through a sub contract and sorts it at his facility and sends it to the plastic waste processor.



PROJECT IMPLEMENTATION

STAKEHOLDER MAPPING

COLLECTION SOURCES

Dry waste collection centre



Zabiulla collects waste from ward number 188, 192 & 196.

PLASTIC WASTE PROCESSORS

Co-processing plant - 1



ACC limited , Wadi

PROJECT IMPLEMENTATION

STAKEHOLDER MAPPING

PLASTIC WASTE PROCESSORS

Co-processing plant - 2



Dalmia Cement (Bharat) Limited-Belgaum

Co-processing plant - 3









JK Cement Works, Muddapur

PROJECT IMPLEMENTATION INTERVENTIONS

The interventions were grouped into the three categories as follows :

Focus Area	Interventions
Infrastructure Development	<ol style="list-style-type: none"> 1. Support was provided to procure PPE, First aid kit, Fire safety equipment, CCTV, signages, water purifier, Desktop with printer and power backup invertor. 2. A conveyor was provided to increase efficiency of sorting.
Capacity building	<ol style="list-style-type: none"> 1. EHS , Bookkeeping , Fire safety and Nutrition training was given to the entrepreneur and workers. 2. Health check ups were conducted for all the workers. 3. Partial support was given for rent of the facility and salary of the workers. 4. Health insurance was given for all the employees. 5. Workers adhered to the SOP implemented.
Business Development	<ol style="list-style-type: none"> 1. Collection drives were executed to promote and increase presence in Bangalore. 2. Business development workshop conducted

Trainings conducted :

Material Handling training	Book keeping training	EHS Training	Fire Equipment and Training	Labour Law Training	Business development
					

PROJECT IMPLEMENTATION INTERVENTIONS



Desktop and printer set up at the facility to digitalize operations



Health check up for all employees

Nutritional training for the employees



Fire safety equipment installed in facility



Fire safety training conducted for employees



Water purifier and CCTV installed at the facility

PPE distributed to all employees



Conveyor installed at facility



PROJECT IMPLEMENTATION INTERVENTIONS



Before

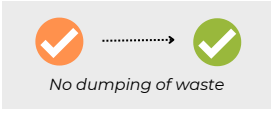

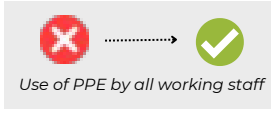
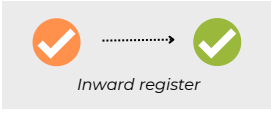
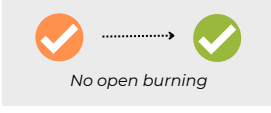

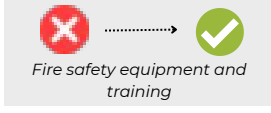
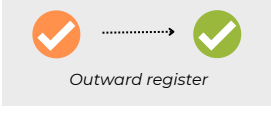
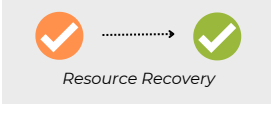
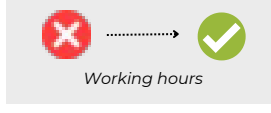
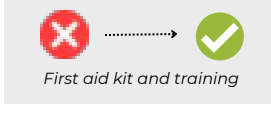
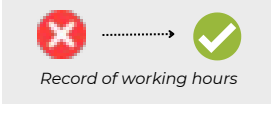
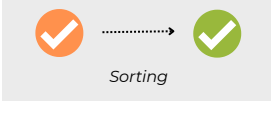

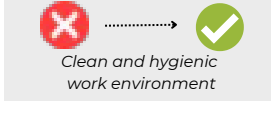
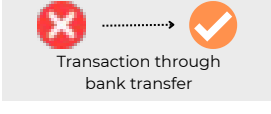
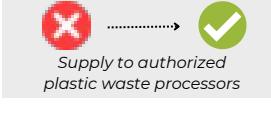

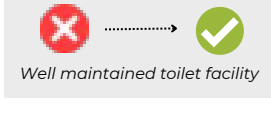
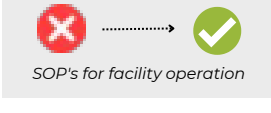


After




PROJECT IMPLEMENTATION

BASELINE TO MIDLINE PROGRESS

The baseline to midline progress is mapped as shown below

Environmental compliance	Social compliance	Safe and Healthy working condition	Data , Process and Documentation
 No dumping of waste	 No Child Labour	 Use of PPE by all working staff	 Inward register
 No open burning	 Minimum wage	 Fire safety equipment and training	 Outward register
 Resource Recovery	 Working hours	 First aid kit and training	 Record of working hours
 Sorting	 *Compensation/ Employee's Benefit (ESI/PF)	 Clean and hygienic work environment	 Transaction through bank transfer
 Supply to authorized plastic waste processors	 Health insurance	 Well maintained toilet facility	 SOP's for facility operation

*ESI/PF not applicable due to number of employees

-  Non-compliant
-  Partially compliant
-  Compliant

Environmental compliance: Weekly audits and EHS training ensured that dumping and open burning were eliminated from the facility. SZW helped streamline material to an authorized plastic waste processor ensuring resource recovery and improving the sorting efficiency.

Social compliance: Weekly audits and Labor Law training ensured that there was no more child labor in the facility. Workers are paid a fixed monthly salary for fixed working hours. Employees were provided with health insurance.

Safe and healthy working conditions: EHS training created awareness among the employees about the importance of safe and hygienic working conditions, usage of PPE, First aid, Hygienic work conditions, and having a well-maintained toilet facility.

Data process and documentation: Bookkeeping training was given to the entrepreneur to improve maintenance log books and registers. An SOP is now followed in the facility which ensures the working hours of the employees are recorded.

PROJECT IMPLEMENTATION

MONITORING AND REPORTING

Key Social Inclusion Indicator		Baseline	Interventions	Outcome
Environmental Compliance	Dumping & open burning	Dumping & open burning was observed	Training given on environmental compliance	No dumping
	Resource recovery	No collection and sorting of low value plastic was found	Provide ethical sourcing surcharge for low value plastic.	Ethically sourced low value plastic
	Supply to authorized plastic waste processors	Plastic waste processors was not known	Build connection with authorized plastic waste processors	Regular dispatches to JK Cement and ACC Limited ,Wadi
Social Compliance	No child labour	No child labour was observed	Through weekly audit, ensure all employees are above 18 years of age.	No child labour was present
	Minimum wage	Employees are paid minimum wages of Rs. 13000	Promoting a fixed payment and regular follow ups	Employees are paid a fixed salary. Female: Rs. 13000 Male: Rs. 13500
	Record of working hours	Not Maintained	Working hours are to be recorded in the attendance book	Fixed working hours of 9am to 6 pm are being recorded and maintained.
	Compensation/ Employee benefits	No ESI/PF provided	If more than 10 employees are present , support provided to help workers get ESI/PF	ESI/PF not applicable
	Health Insurance	No insurance provided	Support to be provided for health insurance	Employees were secured with health insurance.

PROJECT IMPLEMENTATION

MONITORING AND REPORTING

Key Social Inclusion Indicator		Baseline	Interventions	Outcome	
Safe and Healthy working condition	Use of PPE by all working staff	No useage of PPE	Incentive given to purchase PPE (gloves, safety shoes, uniform and masks) First aid kit, Fire safety equipment.	Usage of PPE ensured safety of employees while working.	
	Fire Safety Equipment and Training	No Fire Safety Equipment and training		Facility is now equipped to handle fire accident if any. The employees are trained to use the fire extinguishers.	
	First Aid Kit and Training	No First Aid Kit and Training		Employees are aware about basic first aid procedures.	
	Clean and Hygienic work environment	Dirty work environment		Clean work environment maintained	
	Well maintained toilet facility	No well maintained toilet facility		New facility comes with a toilet & sanitation facility.	Access to toilet at workplace.
Data, Process and Documentation	Inward Record	No inward record maintained	Constant training provided on Bookkeeping and maintaing log records , Support provided to purchase hardware for data capturing	Ensures data capturing both manually and digitally.	
	Outward Record	No outward record maintained		Ensures data capturing both manually and digitally.	
	Record of working hours	No record of working hours		Regular working hours are followed along with habit of attendance marking.	
	Transaction through Bank transfer	Cash transactions		Support provided on opening of bank account	Due to lack of documentation of workers , bank accounts couldn't be created
	SOPs for facility operation	No SOPs for operation		SOP to be framed for the operations	SOP implemented and followed for the operation

PROJECT IMPLEMENTATION MONITORING AND REPORTING

The following table shows the recovery of low value plastic for each month of the project :

Month	Dispatch Quantity	Accepted Quantity	Plastic waste processor
May-22	-	-	ACC Limited, Wadi Cements Works, JK cement , Dalmia Cement (Bharat) Limited-Belgaum
June-22	43,080	43,090	
July-22	93,050	90,840	
August-22	26,420	26,200	
September-22	119,790	118,690	
October-22	167,790	166,630	
November-22	156,900	155,590	
December-22	290,460	288,210	
January-23	27,090	26,800	
February-23	-	-	
March-23	52,830	52,690	
Total	977,410	968,740	

PROJECT IMPLEMENTATION

CHALLENGES AND LEARNING



Zabiulla and his workers in his new facility

1. Difficulty in finding a new facility

Zabiulla struggled to shift to a new facility. Even after finding a potential space, he was asked to move out by the owner due to complaints received by the neighbors about the flies and smell. After 4 months of searching, he found a suitable facility in an industrial area.

2. Resistance to change

Having been a part of the informal sector for 15 years, Zabiulla found it hard to transition to a formal setup. Initially, he required constant mentoring and monitoring. After a few months, Zabiulla understood the advantages of formalizing and is prompt in implementing changes.

3. Availability & retaining of employees

The workers are majorly migrants who are unwilling to commit to one job. This has caused a constant change in employees. They find difficulty in creating bank accounts due to lack of the right documentation.

PROJECT LOCATION 4

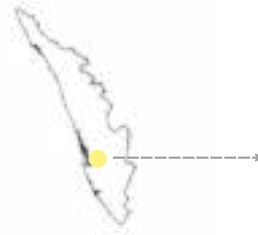
COCHIN



Informal practice of manual loading waste onto trucks

PROJECT IMPLEMENTATION INTRODUCTION

NAME Anees
AGE 27
LOCATION Cochin
EXPERIENCE 3 years
COMPANY NAME W Kerala Waste



Cochin, Kerala

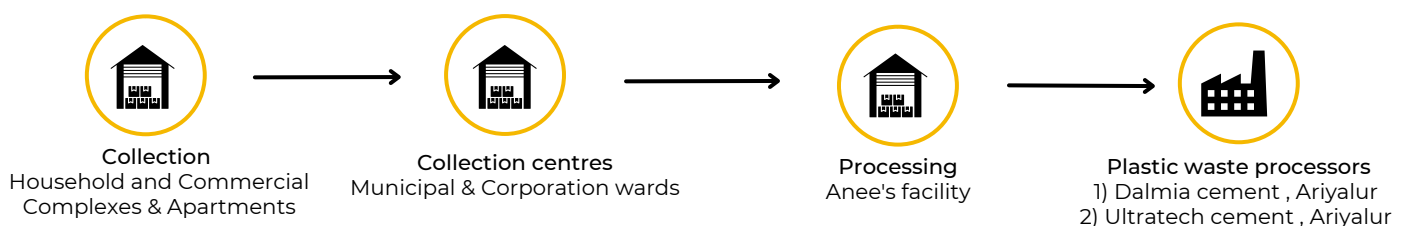
- Anees, 27, is an MBA graduate who is managing his family's waste management business and has 2-3 years of operational experience in various geographical locations such as Bangalore, Mysore, and Coimbatore.
- Currently, he manages a facility of 3000 sq ft with ~25 employees, where the majority of the dry waste processed is low-value plastic.
- He has a strong network of vendors, which enables him to fulfill the given targets of low-value plastic.
- He partnered with SZW to improve his current way of operations towards creating a better compliant and ethical supply chain.



SIZE OF FACILITY	TYPE OF WASTE MANAGED	EMPLOYEES	SOURCE OF WASTE
3000 sq ft	Dry Waste	25+	Municipality collection centre & Scrap dealers & Commercial Complexes

SUPPLY CHAIN

Anees majorly sources the materials from collection centers of local municipalities and corporation and bulk waste generator (apartments and commercial complexes). He collects dry waste and sorts it at his facility and sends it to the plastic waste processors .



PROJECT IMPLEMENTATION

STAKEHOLDER MAPPING

COLLECTION SOURCES

Municipal council Kochi



A collection of dry waste happening in a municipal collection centre

PLASTIC WASTE PROCESSORS

Co processing plant -1



Dalmia Cement (Bharat) Limited-Ariyalur

PROJECT IMPLEMENTATION

STAKEHOLDER MAPPING

PLASTIC WASTE PROCESSORS

Co processing plant -2



Ultratech Cement Ltd-Ariyalur

PROJECT IMPLEMENTATION INTERVENTIONS

The interventions were grouped into the three categories as follows :

Focus Area	Interventions
Infrastructure Development	1. Support was provided to procure PPE, Uniforms, Fire safety equipment, CCTV, signages.
Capacity building	1. EHS, bookkeeping, fire safety training were given to the entrepreneur and workers. 2. Health checkups were conducted for all the workers. 3. Workers adhered to the SOP implemented.
Business Development	1. Business development workshop conducted

Trainings conducted :

Material Handling training	Book keeping training	EHS Training	Fire Equipment and Training	Labour Law Training	Business development
✓	✓	✓	✓	✓	✓

PROJECT IMPLEMENTATION INTERVENTIONS



Fire safety training for all employees

Fire safety equipment procured



EHS training for all employees



Health check up conducted



PPE distributed to all employees

Labor Law training for all employees



PROJECT IMPLEMENTATION INTERVENTIONS

Before






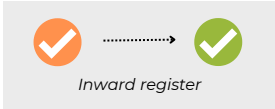
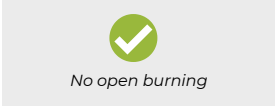

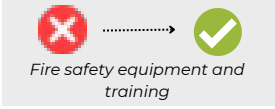


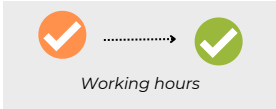
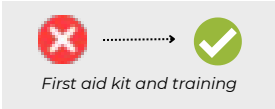
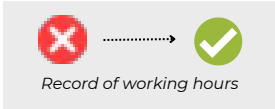


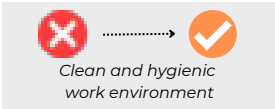
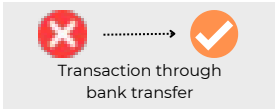
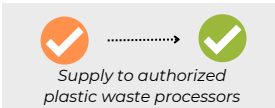


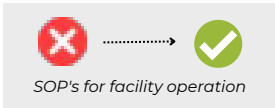
After






PROJECT IMPLEMENTATION

BASELINE TO MIDLINE PROGRESS

The baseline to midline progress is mapped as shown below

Environmental compliance	Social compliance	Safe and Healthy working condition	Data , Process and Documentation
 Dumping of waste	 No Child Labour	 Use of PPE by all working staff	 Inward register
 No open burning	 Minimum wage	 Fire safety equipment and training	 Outward register
 Resource Recovery	 Working hours	 First aid kit and training	 Record of working hours
 Sorting	 *Compensation/ Employee's Benefit (ESI & PF)	 Clean and hygienic work environment	 Transaction through bank transfer
 Supply to authorized plastic waste processors	 Health insurance	 Well maintained toilet facility	 SOP's for facility operation

*ESI & PF are not registered as the employees are temporary

-  Non-compliant
-  Partially compliant
-  Compliant

Environmental compliance: Weekly audits and EHS training ensured that dumping and open burning were eliminated from the facility. SZW helped streamline material to an authorized plastic waste processor ensuring resource recovery.

Social compliance: Regular audits ensured that minimum wages continued to be paid and no child laborers were involved in the operation. However, there was no social security like health insurance provided to the workers.

Safe and healthy working conditions: Previously unaware of the importance of safe and hygienic working conditions, EHS training highlighted the importance of PPE, first aid, and hygienic work conditions.

Data process and documentation: Bookkeeping training was given to the entrepreneur to improve maintenance log books and registers. An SOP is now followed in the facility which ensures working hours are recorded by the employees.

PROJECT IMPLEMENTATION MONITORING AND REPORTING

Key Social Inclusion Indicator		Baseline	Interventions	Outcome
Environmental Compliance	Dumping & open burning	Dumping was observed and no open burning was found.	Training given on environmental compliance	No dumping
	Resource recovery	No collection and sorting of low value plastic was found	Provide ethical sourcing surcharge for low value plastic.	Ethically sourced low value plastic
	Supply to authorized plastic waste processors	End destination was not known	Build connection with authorized plastic waste processors	Regular dispatches to Dalmia cement , Ariyalur and Ultratech cement , Ariyalur
Social Compliance	No child labour	No child labour was observed	Through weekly audit, ensure all employees are above 18 years of age.	No child labor was present
	Minimum wage	Employees are paid minimum wages of Rs. 13500	Promoting a fixed payment and regular follow ups	Employees are paid a fixed salary more than the minimum wage. Men: Rs. 15000 Women: Rs. 14000
	Record of working hours	Not Maintained	Working hours are to be recorded in the attendance book	Fixed working hours of 9am to 6 pm are being recorded and maintained.
	Compensation/ Employee benefits	No ESI/PF provided	If more than 10 employees are present , support provided to help workers get ESI & PF	Efforts was made to have a fixed payroll and register under ESI & PF as per the respective acts applicability. However, Anees dint show much interest to execute it.
	Health Insurance	No insurance provided	Support to be provided to for health insurance	Majority of employees are migrant from several parts of the country and it was hard to avail health insurance without local ID proofs.

PROJECT IMPLEMENTATION

MONITORING AND REPORTING

Key Social Inclusion Indicator		Baseline	Interventions	Outcome
Safe and Healthy working condition	Use of PPE by all working staff	No useage of PPE	Incentive given to purchase PPE (gloves, safety shoes, uniform and masks) First aid kit, Fire safety equipment.	Usage of PPE ensured safety of employees while working.
	Fire Safety Equipment and Training	No Fire Safety Equipment and training		Facility is now equipped to handle fire accident if any. The employees are trained to use the fire extinguishers.
	First Aid Kit and Training	No First Aid Kit and Training		Employees are aware about basic first aid procedures.
	Clean and Hygienic work environment	Dirty work environment		Work environment continued to remain not clean and hygienic
	Well maintained toilet facility	No well maintained toilet facility		Toilet facility available but not well maintained
Data, Process and Documentation	Inward Record	No inward record maintained	Constant training provided on Bookkeeping and maintaing log records , Support provided to purchase hardware for data capturing	Ensures data capturing both manually and digitally.
	Outward Record	No outward record maintained		Ensures data capturing both manually and digitally.
	Record of working hours	No record of working hours		Regular working hours are followed along with habit of attendance marking.
	Transaction through bank transfer	Cash transactions	Support provided on opening of bank account	Due to lack of documentation of workers , bank accounts couldn't be created for all the employees.
	SOPs for facility operation	No SOPs for operation	SOP to be framed for the operations	SOP implemented and followed for the operation

PROJECT IMPLEMENTATION

MONITORING AND REPORTING

The following table shows the recovery of low value plastic for each month of the project :

Month	Dispatch Quantity	Accepted Quantity	Plastic waste processors
May-22	47,200	46,980	<u>Ultratech Cement Ltd, Ariyalur</u> <u>Dalmia Cement (Bharat) Ltd,</u> <u>Dalmiapuram</u>
June-22	49,040	48,220	
July-22	39,760	39,120	
August-22	58,090	57,480	
September-22	127,450	127,080	
October-22	88,330	88,740	
November-22	214,980	215,180	
December-22	241,720	238,870	
January-23	115,740	111,890	
February-23	-	-	
March-23	-	-	
Total	982,310	973,560	

PROJECT IMPLEMENTATION

CHALLENGES AND LEARNING



EHS training given to Anee's workers

1. Lack of commitment

Due to the well-established business, Anees was highly motivated toward business but not entirely toward environmental and social compliance. While certain compliances were fulfilled (financial discipline, staff accommodation, minimum wages) he was not entirely inclined to comply through SI interventions (low adherence to EHS, bookkeeping, bank transactions, and social security benefits).

2. Frequent shutdowns of end destinations

There is a severe shortage of cement factories with co-processing facilities in Southern India. There are only 2 cement factories within a reasonable vicinity of Cochin and there is a huge dependency on these two plants. Due to several reasons across the year, these cement plants have inconsistent material intake which creates unpredictable operational challenges.

3. Ability to fulfill orders & good quality of LVP

Due to a well-established network in the market, Anees was able to deliver LVP quantities within the specified time. The material quality was good and he already has baling machinery which makes it ideal to operate reverse logistics.

The below table shows the impact created by the project

Metric	Number	Comment
Plastic waste diverted from landfill	3,793 MT	2,813.5 MT of plastic sent to cement kilns and 979.72 MT sent to waste to energy plant
GHG emissions reduced	4,069 MT of CO2E	Diverting 3,793 MT of low value plastics prevent 4,069 tonnes of CO2-equivalent emissions entering the atmosphere
Waste entrepreneurs that brought in a mindset shift	3 (out of 4)	Out of the 4 enrolled entrepreneurs, only 3 entrepreneurs made changes into their businesses to transition from informal to formal
Waste workers benefited	40+	The workers employed at the various facilities are given minimum wage, paid a fixed amount monthly through bank transfer. Health check up's were conducted and health insurance has been provided to them. They work fixed timings and work in a safe and dignified environment
Transport vendors	4	4 transport vendors were onboarded by the respective entrepreneurs and a partnership was built for regular transport of material
Authorized plastic waste processors	9	Partnership with 8 cement kilns and 1 waste to energy plant for processing of material
Revenue generated by entrepreneurs by diverting LVP	3x	SZW provided 3x times better price compared with the industry standard for diversion of LVP to the entrepreneurs. This helps entrepreneurs operate their business effectively.

— SDG Impact —



IMPACT TESTIMONIALS



" After joining here, I have fixed work timings and my salary comes from my bank. I am feeling happy working here and so is my family"

- Krishna, Pandhurna

" I feel very good here. We have no troubles while working here. We get to go home on time and they also conduct health checkups for us"

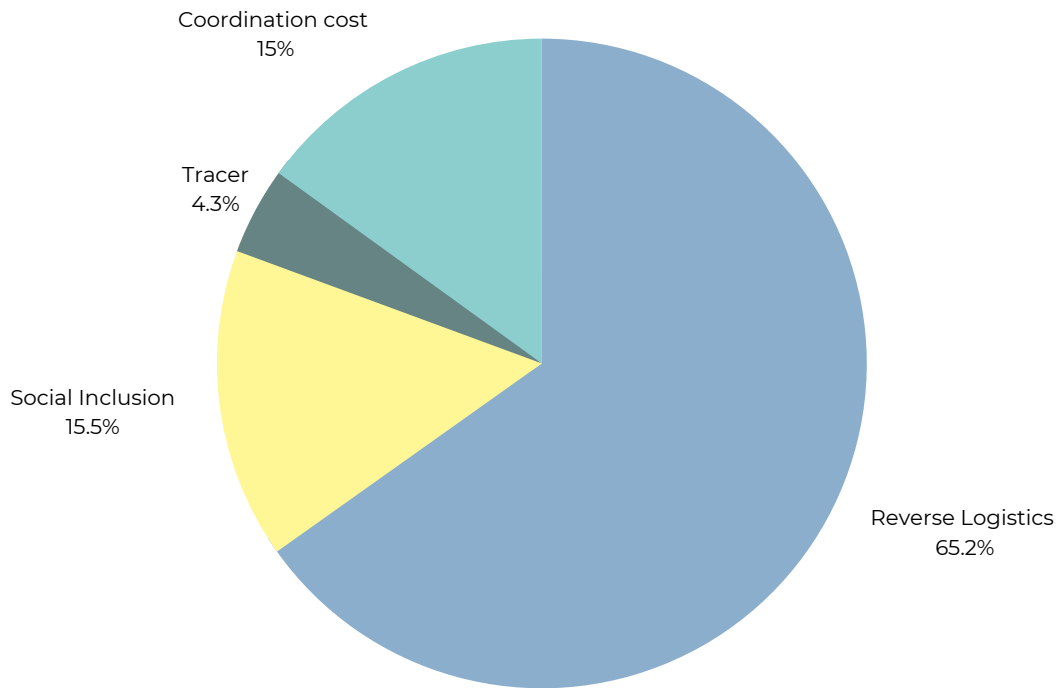
- Noor Nisha, Delhi



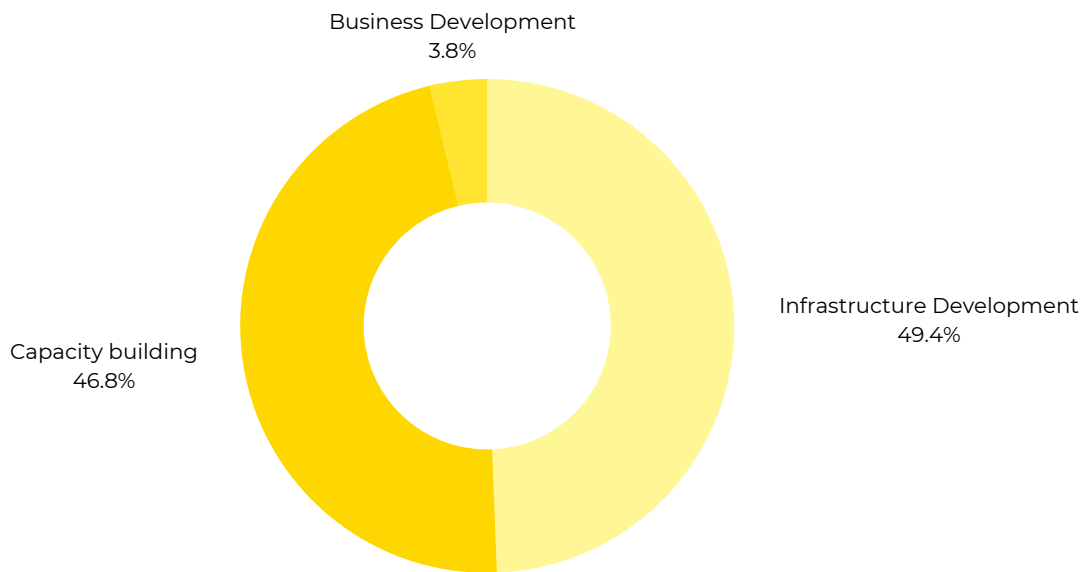
"We are provided with essentials such as health insurance, health checkup, mask, gloves & helmets. It ensures our safety while working. Hence, I feel happy and safe while working."

-Fayaz, Bangalore

Breakup of the total project budget



Breakup of the social inclusion budget utilisation*



*Please note that from the total social inclusion(SI) budget, only 64% was utilised for SI interventions. 24% of SI budget was repurposed for additional LVP diversion and the remaining 12% of the SI budget is carried forward for business development for the next three months.



Entrepreneurs with the SZW SI team

Below are the key takeaways and learnings from the project:

1. Consistent supply chains

During the project execution phase, a start-stop scenario hampered operational continuity leading to disruption in the supply chain. During the initial project phase, it is important to have consistent and continued operations to help build the confidence of the entrepreneurs.

2. Entrepreneur's acceptance to change

While this project implemented a defined entrepreneur selection process, the project outcomes demonstrated various levels of acceptance to change. Entrepreneurs like Arun, Tajuddin, and Zabiulla were forthcoming, while Anees did not give importance to the formalization aspect as much as the operations. SZW will further strengthen the capacity-building process in order to sustain the behavior change aspect of a diverse background of entrepreneurs.

3. Compliance can be a sword against exploitation

The entrepreneurs acknowledged that formal and compliant operations lead to reduced exploitation as compared to their earlier informal way of operations. Additionally, adhering to compliance opens new opportunities for sources of waste and overall ease of business.

4. Cost of compliance

Compliance comes with a cost that the entrepreneurs are willing to incur. They have understood that investing in a formal and compliant operation will result in increased revenue through efficient processing of waste and better price realization through the sale of waste.



SZW coordinator with Arun Shende in Pandhurna dump yard

1. Diversion to recycling and traceability

From initial trials, it has been identified that through mechanised pre-processing of low value plastics can help improve quality of plastic waste recovered. It has been found that recyclers are willing to establish partnerships if consistent supplies of such plastics can be secured. This will help diversion of plastic from co-processing to recycling. This will not only ensure maximum resource recovery but also better price realization hence leading to an improved business case. Additionally it is observed that going forward, the depth of traceability can be achieved as further upstream in the supply chain as practically possible.

2. Sustained behavioral changes of the entrepreneurs

Through this project, the entrepreneurs have demonstrated a positive mindset and have embraced a new way of operations. Sustaining these behavioral changes requires continued monitoring and capacity-building interventions when required. Additionally, continuous support through new business opportunities will enable a cascading effect through social learning.

3. Demonstrating self-sustained business model

The current revenue model is insufficient for the financial viability of operations. Additional revenue streams such as various service fee models will need to be introduced. Cost optimization can help arrive at an ideal business case. Stronger and long-term partnerships with ULBs to facilitate growth and a steady flow of waste can help reduce the costs of procurement of waste.

4. Project replicability

Data and learnings from this project have helped to evolve a framework for the integration of informal waste workers into the formal waste value chain. This Social Inclusion framework is based on an entrepreneurship development model with a core focus on infrastructure development, capacity building, and a self-sustaining business model. As this sector needs strong human capital to drive the required changes to establish an ethical and formal waste value chain, this framework can be used for replication and scaleup of similar projects in other geographies in India, especially tier 2 and 3 cities for creating an immediate and larger environmental and social impact.

Design and Project Management



Arun Murugesh
Regional Director



Sayujya Suresh
Sr. Project Manager

Capacity Building



Karthikeyan MV
Project Coordinator



Pooja Anand
Project Coordinator



Soumya M
Manager

Operation



Sinchith B A
Project Coordinator
Sourcing



Ramesh B
Sr . Project Coordinator
Quality & Logistics



Mamatha J
EPR Admin
Documentation



Venkatesh
Sr . Project Coordinator
Accounts



To Create a Zero Waste World through Circular Economy