

Impact assessment report

Project name: E-waste management

Apple India

March 2026



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Acknowledgements

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We would like to thank Apple India, Paperman Foundation of India, and E[co]work Inclusive Recycling Foundation for their continued support and assistance in carrying out the study. We are also grateful to the formalised workers, project team of E[co]work, and other stakeholders who interacted with us during the study.

Executive summary

Apple India partnered with the Paperman Foundation of India (PFI) to launch a co-working space and e-waste incubator hub for informal e-waste micro-entrepreneurs.

The E-waste management project, funded by Apple India and executed by the Paperman Foundation of India in collaboration with E[co]work (Inclusive Recycling Foundation), seeks to formalise the informal e-waste sector. The initiative establishes both a physical facility to undertake waste management activities and a platform to enable collaboration among multiple stakeholders. Its core objective is to integrate informal workers into the formal e-waste value chain, thereby advancing sustainability and inclusivity in waste management practices.

To achieve this, the project has instituting standard facility operations and offering reasonably priced service packages to encourage participation from the unorganised e-waste sector. Community outreach and participatory promotional activities are being undertaken with the aim of engaging informal workers. Vocational training programs are provided to strengthen technical capacity, including dismantling processes, solutions for problematic fractions, and the safe handling of hazardous waste. In addition, individuals receive structured training in operational practices, enabling them to pursue a career in the e-waste management sector. By providing a safe, organized, and supportive environment, the project addresses critical challenges related to regulatory compliance, environmental sustainability, and livelihood enhancement.

Apple India engaged Grant Thornton Bharat LLP to conduct impact assessment of the e-waste management project with an objective to assess the impact of the project activities. The study was conducted onsite in Ghaziabad, Uttar Pradesh to evaluate the project's progress, impact and gather insights from relevant stakeholders.

Key findings of the study:

Relevance: India generates substantial volumes of e-waste annually, with e-waste collection and processing largely concentrated in the informal sector. Unsafe practices, particularly in North-East Delhi, pose serious environmental and health risks. The project directly addresses these challenges by supporting the informal sector through safer workplaces, training, and access to formal markets. It contributes to SDG 8 (decent work), SDG 11 (sustainable cities), and SDG 12 (responsible consumption and production).

Effectiveness: The project has met all legal requirements, ensuring smooth operations. Informal workers have been transitioned into formal employment, gaining improved skills, safer working conditions, and dignity. Awareness and training programs have reached schools, colleges, informal workers, and government agencies, fostering behavioural change and knowledge dissemination.

Facility operations demonstrate strong adherence to safety, hygiene, and infrastructure standards.

Efficiency: Resources have been optimised through modular workstations, organized storage, and shared infrastructure, while the space rental initiative generates additional revenue and increases space utilization. Complementing these measures, outreach campaigns conducted via WhatsApp, social media, and Resident Welfare Associations (RWAs) achieved wide reach at minimal cost. Furthermore, the training programs have provided affordable, practical skills that has enhanced stakeholders' awareness, knowledge, and skills.

Impact: The project has achieved measurable economic, environmental, and social outcomes. It has generated over ₹75 lakh in revenue, created EPR credits, and provided stable incomes. It has also ensured safe disposal of 3,015 kg of hazardous waste and promoted sustainable dismantling practices. Additionally, it enhanced worker dignity, safety, regulated working hours, and improved societal perceptions. Worker-driven innovations, such as ergonomic dismantling tables, further strengthened outcomes.

Sustainability: By embedding compliance, environmental safeguards, and worker welfare into its operations, the project has built a strong foundation for long-term sustainability. Future plans to obtain refurbishment license will expand revenue streams and social benefits, while ongoing training and awareness initiatives will ensure sustained transfer of knowledge and best practices to the stakeholders.

Coherence: The project aligns with India's E-Waste (Management) Rules, 2022, and sustainability agendas. Collaboration with educational institutions, government agencies, and community groups reinforces stakeholder coherence.

1. Introduction

a. Background and context

According to a WHO report, millions of electrical and electronic devices are discarded annually as they get damaged or become obsolete, resulting in generation of e-waste. This poses environmental and health risks if not properly treated, disposed of, or recycled. Common e-waste items include computers, mobile phones, large household appliances, and medical equipment. Every year, millions of tonnes of e-waste is recycled through improper methods which are harmful, improperly stored, and disposed of in landfills.

In India, e-waste is defined by the E-waste (Management) Rules of 2016, as discarded electrical and electronic equipment (EEE), including manufacturing, refurbishment, and repair rejects. The Ministry of Environment, Forest, and Climate Change reported that 1.6 million tonnes of e-waste was generated in 2021-2022. The Ministry further revised the rules and introduced the E-Waste (Management) Rules, 2022, effective from April 1, 2023. These new rules aim to manage e-waste sustainably and establish an improved EPR system, requiring all manufacturers, producers, refurbishers, and recyclers to register on a CPCB-developed portal. The new provisions aim to establish a formal sector with proper waste management activities.

Demographic profile

The north-eastern region of Delhi serves as the principal hub for e-waste recycling in India. It houses over 3,000 informal dismantling units that provide employment to a large workforce in the informal sector.¹ Spanning 62 square kilometers and home to more than 2.2 million residents. This area encompasses both semi-urban and urban village settings. It is strategically located, bordered by the Yamuna River to the west and Ghaziabad District (Uttar Pradesh) to the north, thus positioning it as a key centre for e-waste processing activities.

The e-waste dismantling industry in this region is predominantly male dominated, with a significant proportion of the workforce originating from the Muslim community. Many of these workers and their families have migrated from rural areas surrounding the National Capital Region (NCR) to settle in North-East Delhi.² Having lived and worked in these neighbourhoods for years, the dismantlers have witnessed substantial changes and development in their local environment over time.

¹ <https://communitydesignagency.com/projects/ecowork/>

² https://www.ncrpb.nic.in/pdf_files/06_Chapter3_cma.pdf

b. About the project

The project has been launched to bridge the gap between the informal and formal e-waste sectors, enhancing safety and efficiency for informal workers while addressing regulatory and environmental concerns. By providing training, support services, and access to markets, the project empowers micro-entrepreneurs and facilitates their transition into the established sector. The project aims to mitigate environmental and health risks due to improper waste disposal methods by offering training and support on safe disposal mechanisms. It aims at improving e-waste management practices, boosting economic empowerment, ensuring all the necessary legal compliances, and raising community awareness about responsible waste management. The approach reduces environmental pollution and promotes sustainable development.

About E-waste

E-waste, or electronic waste, as defined by the government is discarded electrical or electronic devices that are now obsolete. This includes items such as computers, mobile phones, televisions, refrigerators, and other electronic appliances which have now reached the end-of-life stage. These devices often contain hazardous materials like lead, mercury, and cadmium, which may pose significant environmental and health risks if not safely disposed/recycled.

In India, the Ministry of Environment, Forest, and Climate Change (MoEFCC) has published specific guidelines under the E-Waste (Management) Rules, 2016, which categorizes e-waste and outlines the responsibilities of producers, consumers, and recyclers to ensure safe disposal and recycling of the waste materials.

Objectives of the project

Key objectives identified from the project details shared by the implementing organisation include:

- Provide a safe and affordable space for e- waste operations.
- Establish an integrative work-model adapted for informal micro entrepreneurs.
- Provide a pathway to transition from the informal sector to formal business owners.
- Community outreach and awareness initiatives to emphasize the benefits of safe and responsible e-waste management and proper disposal practices.
- Business support services to informal microentrepreneurs for formalisation.

c. Theory of change

Table 1: Theory of change

Resources	Activities	Output	Outcomes	Impact
• Ideas • Funds • Team members • Infrastructure • Technology • Partnerships • Regulatory framework	• Facility setup • Trainings and knowledge transfer • Community outreach • Capacity building of informal micro entrepreneurs • Collection drives • Processing and Recycling • Promotional activities	• Functional e-waste management facilities • No. of informal sector business owners and workers • No. of informal micro entrepreneurs using facility • No. of community outreach activities conducted • No. of trainings for informal micro entrepreneurs and recyclers • Amount of e-waste collected	• Improved and safe environment for e-waste operations • Co-working spaces for inclusive e-waste management • Creation of jobs and economic opportunities for informal sector workers • Business support services to informal microentrepreneurs for formalization • Improved compliance with e-waste management regulations • Increased awareness and knowledge about e-waste management among the community.	• To benefit society and the environment through safe and inclusive e-waste recycling • Contribution to broader sustainable development goals

2. About the study

Grant Thornton Bharat LLP³ was appointed by Apple India to conduct an impact assessment study of the E-waste management project. To conduct the assessment, a collaborative approach using the Theory of change and OECD DAC framework was used to identify key areas of enquiry for each stakeholder group and to obtain a holistic understanding of the project results. The study was executed by interviewing the beneficiaries of the project to gauge an overall understanding of the outcomes and impact of the activities undertaken.

The assessment included discussions with stakeholders to understand the status of the project and map the progress. The key objectives were:

- Evaluating the project's impact.
- Gathering feedback of the stakeholders and beneficiaries of the project.
- Analysing and reporting the data collected through interactions with the beneficiaries.

The study aimed to understand the overall process of the project through analysis of the data collected and further corroborating it with inferences from stakeholder discussions.

a. Assessment approach

For the assessment, the Organization for Economic Cooperation and Development-Development Assistance Committee (OECD DAC) framework was used to critically analyse the project on principles of relevance, effectiveness, efficiency, impact, sustainability, and coherence. To gather data for each of these principles, stakeholders were mapped enabling a robust data collection, analysis, and documentation of findings.

Table 2: OECD DAC Framework

Principles for evaluation	Brief on the principles
Relevance	• To what extent the objectives of the project were suitable as per the need of the area? • Were the activities and outputs of the project consistent with the overall goal and the attainment of its objectives? • Were the activities and outputs consistent with the intended impacts and effects?
Effectiveness	• To what extent were the objectives achieved/ likely to be achieved? • What were the major factors influencing the achievement or non-achievement of the objectives?
Efficiency	• Were the activities cost-efficient?

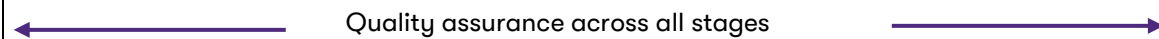
³ Grant Thornton Bharat LLP or GTBL is a member of Grant Thornton International Ltd. The firm is at the forefront of helping reshape the values in our profession. We are helping shape various industry ecosystems through our work across Assurance, Tax, Risk, Transactions, Technology and Consulting, and are going beyond to shape a more Vibrant Bharat. Our ESG practice constitutes of a dedicated team working to support efforts towards sustainable development. Our team understands the common challenges, and provides tailor-made solutions leveraging on our knowledge, experience, and enthusiasm.

Principles for evaluation	Brief on the principles
	- Has the process been documented thoroughly, with controls and checks in place? - Were the objectives achieved on time? - Was the project implemented in the most efficient way compared to alternatives?
Impact	- What has happened because of the project? - What real difference has the activity made to the trainees? - How many people have been affected?
Sustainability	- To what extent did the benefits of a project continue after donor funding ceased? - What were the major factors that influenced the achievement or non-achievement of sustainability of the project?
Coherence	- The compatibility of the intervention with other interventions in a country, sector, or institution. - To what extent the other interventions (particularly policies) support or undermine the intervention, and vice versa.

b. Methodology

The methodology followed to conduct the assessment was spread across three stages.

Table 3: Methodology followed

Stage I: Planning	Stage II: Data collection	Stage III: Reporting
		
- Inception meeting to understand project context, objectives, and approach. - Review of available documents and reports to assess the current status of the initiatives - Assessment design including identification of key stakeholders and areas of enquiries. - Study design including identification of key stakeholders and areas of enquiries.	- Development of qualitative and quantitative tools for data collection. - Conduct on-site and telephonic surveys, along with discussions with relevant individuals and stakeholders.	- Data analysis to identify relevant trends and key statistics. - Prepare draft narrative report, discuss report findings, obtain relevant inputs for final report. - Preparing and issuing final report.

c. Data collection

Stakeholder wise tools were created for primary interactions. Stakeholders such as individuals trained in e-waste management, participants of awareness programs, and the E[co]work team were covered through In-Depth Interviews (IDI) and Focused group discussions (FGD). Informal workers trained, including those working at the facility, were covered through individual surveys.

Physical visits were conducted to the E[co]work facility in Ghaziabad, Uttar Pradesh and discussions were held with the following stakeholders.

Table 4: Stakeholder sampling and key areas of enquiry

S/N	Stakeholder	Sample		Tool	Key areas of enquiry
		Planned	Covered		
1.	Informal workers trained	17	12	Quantitative (Individual survey)	○ Training and skill development ○ Amenities and infrastructure ○ Employment and job satisfaction ○ Integration into the formal value chain ○ Community and social benefits
2.	People trained in e-waste management	43	5	Qualitative (IDIs)	○ Training experience and content ○ Application of skills ○ Workplace safety ○ Satisfaction and Feedback
3.	People who attended awareness programs	75	7		○ Awareness and participation ○ Understanding and knowledge gained ○ Behavioural change ○ Satisfaction and feedback ○ Future engagement
4.	E[co]work team	-	5	Qualitative (IDIs and FGD)	○ Facility and operations ○ Legal compliance ○ Outreach and engagement ○ Training and capacity building ○ Formalisation of informal sector ○ Performance indicators ○ Challenges and lessons

d. Limitation of the study

- Limited stakeholders could be engaged due to the following reasons:
 - Most of the informal workers who had been trained and engaged at the facility were no longer employed at the time of the study, restricting their participation.
 - Outreach for individuals trained in e-waste management had been conducted by a third-party organization (BK Welfare Foundation). Consequently, after completion of the e-waste management training, E[co]work did not have access to the trainees, limiting the number of participants who could be engaged.
 - Participants of awareness programs were primarily school and college students, and their faculty members. Due to ongoing academic sessions, only a limited number of these stakeholders could be engaged.
- While in-person, on-field data collection was undertaken, the limited availability of stakeholders necessitated the use of telephonic surveys and discussions, which were facilitated by the E[co]work team during the on-site visit at the facility.

3. Findings

The following section captures the multifaceted progress of the project. It provides details regarding the status of the project, encompassing legal compliance, worker inclusion, facility set-up and operations, and measurable outcomes.

a. Legal compliance

Addressing legal requirements prior to commencing an e-waste management project is vital for several reasons:

- It reduces exposure to legal risks and liabilities, thereby protecting both the project and its stakeholders from legal repercussions.
- Adhering to regulations ensures environmental protection through proper handling, disposal, and recycling of electronic waste, thereby reducing harm to the ecosystem and human health.
- Compliance enhances the project's credibility, enabling smoother operations, attracting investment, and fostering collaboration with government bodies and other partners.

Prioritizing legal compliance establishes a strong foundation for the project's sustainability, ethical conduct, and long-term success in addressing the challenges of e-waste management. By meeting legal requirements, the project complies with ethical standards and ensures sustainable operations and growth.

The following legal requirements were met in order to establish and operate the facility:

Table 5: Legal compliances

Legal requirements	Need	Status
Company Incorporation	Establishes the project as a legal entity, providing liability, protection and enabling access to business opportunities.	Obtained
GST	Facilitates compliance with tax regulations, allows for input tax credit, and enhances credibility in business transactions.	Obtained
Lease Registration	Ensures legal validity of property use, preventing disputes and providing security of tenure	Obtained
UPSIDC Permit	Permission obtained from the Uttar Pradesh State Industrial Development Corporation, ensuring compliance with local industrial regulations.	Obtained
UP SPCB CTE (Consent to Establish)	Consent obtained from the Uttar Pradesh State Pollution Control Board for establishing the project, ensuring compliance with environmental regulations from the outset.	Obtained

Legal requirements	Need	Status
UP SPCB CTO (Consent to Operate)	Obtained permission from the Uttar Pradesh State Pollution Control Board to commence operations, ensuring adherence to environmental standards during project execution.	Obtained
UP SPCB E-waste Authorisation	Obtained authorisation from the Uttar Pradesh State Pollution Control Board specifically for managing e-waste, ensuring compliance with specialised regulations for handling electronic waste.	Obtained
Section 12A/80G (Provisional)	Provides tax exemptions and benefits to donors contributing to the project, encouraging philanthropic support.	Obtained
Udyog Aadhaar	Facilitates registration as a micro, small, or medium enterprise (MSME), enabling access to various benefits and incentives provided by the government.	Obtained
Fire NOC	No Objection Certificate from the fire department, ensuring compliance with fire safety standards and mitigating risks of fire hazards is in the process to obtain.	Obtained
EPR Portal Registration	Registration with the Extended Producer Responsibility (EPR) portal is in process to ensure compliance with regulations related to the responsible management of electronic waste throughout its lifecycle.	Obtained

Future plan

In the future, E[co]work aims to register under the Uttar Pradesh Shops and Commercial Establishments Act and subsequently obtain the refurbishment license.

This will support revenue growth by enabling refurbishment of e-waste collected in working condition. The E[co]work team also highlighted that, apart from revenue growth they intend to support poor and disadvantaged people by providing refurbished mobile phones and other electronic devices.

b. Informal worker integration into Formal Value Chain

The informal workers trained and engaged directly at the facility in FY 24-25 were enquired about their integration into the formal value chain. These enquiries focused on their transition from informal to formal work, working conditions, and improvement in social standards and dignity.

Transition to formal work

The workers were asked how they came to know about the facility. 83% respondents learned about the facility through friends and family who had previously worked at the facility, while 17% were informed directly by the E[co]work team through outreach initiatives.

Furthermore, the workers were asked about their occupation prior to joining the facility. 100% of the respondents stated that they worked in the informal and unorganised waste sector. This highlights the facility's role in transitioning informal workers into the formal value chain.

Working conditions

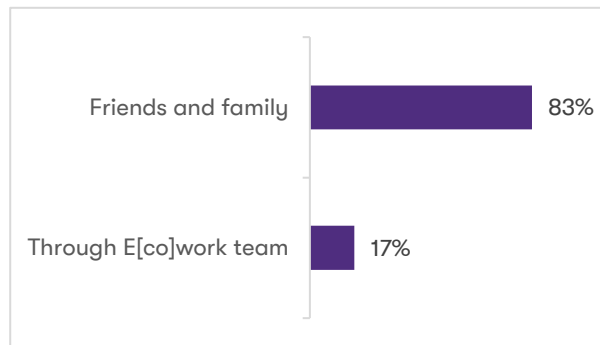
The workers were asked about the amenities available to them at the facility.

100% of respondents stated that amenities such as storage units for personal belongings, Personal Protective Equipment (PPE) including gloves, masks, safety goggles, and protective clothing, as well as clean drinking water, washrooms, and resting space, are available to them. 83% of respondents acknowledged the availability of changing room at the facility.

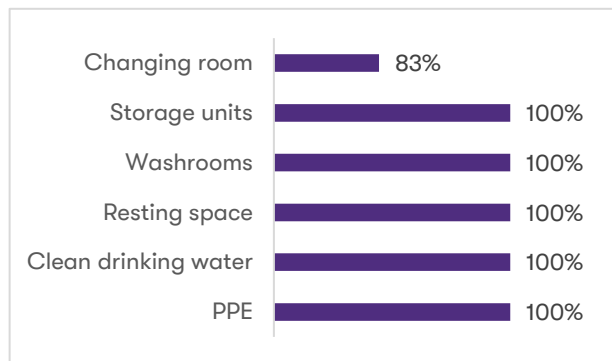
Workers were further asked to indicate their level of satisfaction with the amenities provided. 83% of respondents reported being 'Highly satisfied,' while the remaining 17% stated they were 'Satisfied.'

This indicates that essential amenities are comprehensively available at the facility with universal access, and the overall satisfaction levels among the workers remain very high.

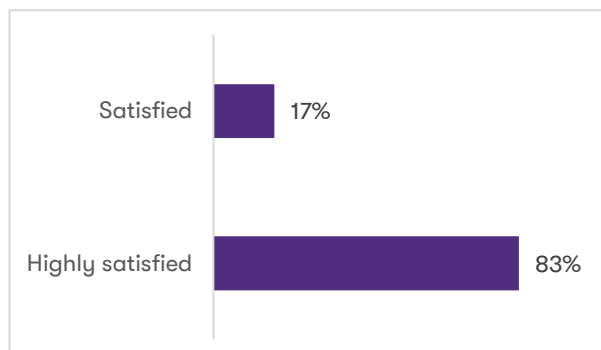
Graph 1: Knowledge about the facility



Graph 2: Amenities available at the facility



Graph 3: Satisfaction level with the amenities provided



"In the unorganized sector, we faced poor working conditions with no fixed hours. Here at the facility, we have a regulated schedule of eight working hours with one hour for rest and lunch, which has improved our working conditions."

-Salman, Trained informal worker

Social standards and dignity

The workers were asked how the formalisation has benefited them, to which 100% of respondents stated that formalisation has provided them with stable working hours and income as well as safer working conditions.

92% of respondents reported enhanced respect from peers and society, indicating positive shift in social perceptions and dignity.

Overall, the integration of informal workers into Formal Value Chain has improved not only material conditions but also enhanced their respect, social perceptions, and dignity.

Graph 4: Benefits received through formalisation



c. Facility operations and infrastructure utilization

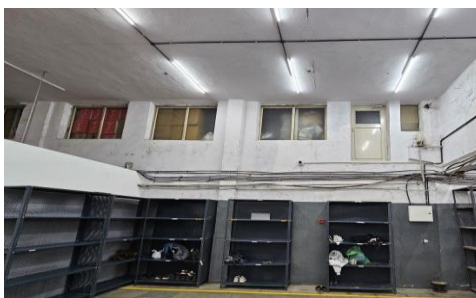
About the facility

Located in Ghaziabad's Meerut Road industrial area, the facility was built in the 1970s and spans 21,800 sq. ft. with an additional 1,200 sq. ft. mezzanine. Leased for five years from January 2022, it has an authorized processing capacity of 10 metric tonnes per day (3,600 tonnes annually).

Structure

The facility is equipped with ventilation systems, exhaust fans, and pedestal fans to maintain air quality. It has bright lighting to ensure safe operations, while modular workstations with ergonomic furniture support worker comfort.

A full range of dismantling and processing tools—hand tools, power tools, and dust extractors are maintained regularly.



Lighting and storage spaces



Tools



CCTV camera and list of e-waste items

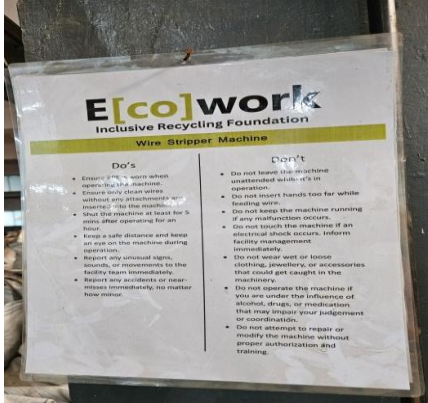


Worker at a working station

Organized storage areas, including secure spaces for hazardous fractions, are supported by clear labelling and inventory systems.

Workplace signage and instructional displays

Clear signage and visual communication tools are prominently displayed throughout the facility. Safety signs indicate hazards, mandatory precautions, and restricted activities, while directional and emergency signage ensures accessibility to exits, fire extinguishers, and first aid kits.



Dos and don'ts instructions



Emergency exit with fire extinguisher

Posters, infographics, and floor markings reinforce safe handling practices, organized workflows, and compliance with safety protocols. Tools and equipment are clearly labelled with usage instructions to promote correct and secure operations.

Health and hygiene

Workers are provided with PPE, including gloves, masks, goggles, and protective clothing, significantly reducing injuries that were previously common in informal dismantling practices. The facility maintains clean



Workers unloading e-waste wearing PPE kit



Drinking water dispenser

restrooms with hygiene supplies, ensures safe storage of hazardous and non-hazardous waste, and provides readily available first aid kits. A designated pantry area offers space for rest and meals, fostering worker well-being and a sense of community.

Overall, the facility has a well-structured, safe, and hygienic environment for e-waste management, equipped with modern infrastructure, clear safety protocols,

and worker welfare measures to ensure efficient operations and minimize health and environmental risk.

c. Awareness, Outreach, and Training

Effective e-waste management relies on awareness, outreach, and training which inform stakeholders about the environmental and health risks of improper disposal, promote responsible recycling, and foster community participation. These efforts cultivate a culture of sustainability, ensuring that individuals and organizations recognize the importance of proper e-waste handling and are motivated to act.

Awareness initiatives

Awareness programs were organized for students and teachers across various educational institutions, conducted both at the facility and on institution campuses. In addition, similar programs were held for the informal sector, ensuring that diverse stakeholders were engaged and informed about e-waste management practices.



College students' awareness session

Awareness programs conducted with colleges were designed to provide students with a comprehensive understanding of e-waste management. The sessions addressed the various types of e-waste, the processes involved in its management, and the key challenges and pain points faced within the sector.

Environmental considerations associated with improper disposal were also emphasized. These initiatives aimed to cultivate informed perspectives among young stakeholders and encourage their active engagement in responsible e-waste management practices.

“Following the awareness program, our students organised workshops within the university to further disseminate knowledge on e-waste management. In addition, with support from E[co]work, the Environmental Law Department developed a ‘People’s Guide’ on sustainable e-waste management to promote informed and responsible practices.”

-Prakhar Pandey, Faculty member, OP Jindal University

Awareness programs conducted with schools

focused on educating students how to segregate and collect e-waste responsibly. The sessions included presentations on the dangers of improper disposal and the benefits of recycling. Students also took part in a dismantling workshop to see how e-waste is handled, followed by a reflection session that connected e-waste management to climate action.



School students' awareness session

EPR workshop was conducted for the informal sector to explain the concept of EPR credits under the revised E-waste Management Rules 2022. It also invited informal dismantlers to work with E[co]work so they could use EPR credits as an extra source of funding.



EPR workshop with informal sector



Awareness workshop with GMA

Additionally, **awareness workshops were also conducted for government stakeholders** such as the Ghaziabad Management Association (GMA). It introduced them to the basics of e-waste, its hazards, and the benefits of proper recycling, along with guidance on compliance requirements for manufacturing companies as bulk users and producers.

Outreach

Community outreach was carried out through housing society WhatsApp groups, Ghaziabad Management Association members, social media, and campaigns such as #declutterthisDiwali with RWA engagement. To encourage participation, incentives such as certificates of appreciation and Diwali lights carrying messages on proper end-of-life recycling were provided.

The outreach focused on increasing awareness of the environmental and health effects of e-waste, while highlighting the need for its responsible handling and recycling.



Awareness pamphlet

Training on e-waste management

Training program on 'Career and Entrepreneurial Opportunities in the E-waste Sector' was conducted for high school graduates and freshers seeking to build skills for the job market. The sessions introduced participants to the basics of e-waste, material handling and dismantling, as well as the safe storage of dismantled

"The training program significantly enhanced my knowledge and introduced me to aspects of e-waste management, including material handling and the identification of hazardous materials, which I had not been aware of earlier."

-Harshita, participant of the training program

fractions and hazardous waste, equipping them with practical knowledge for future employment and entrepreneurship in the sector.

The following table presents data on stakeholder engagement and participation in e-waste awareness and training programs during FY 2024–25:

Table 6: Awareness and training workshops data

**As per the data shared by E[co]work*

Activity*	No. of participants/ sessions*
Informal sector workers engaged through outreach activities	984
No. of training/awareness activities conducted	11
Participants in training and awareness programs.	326

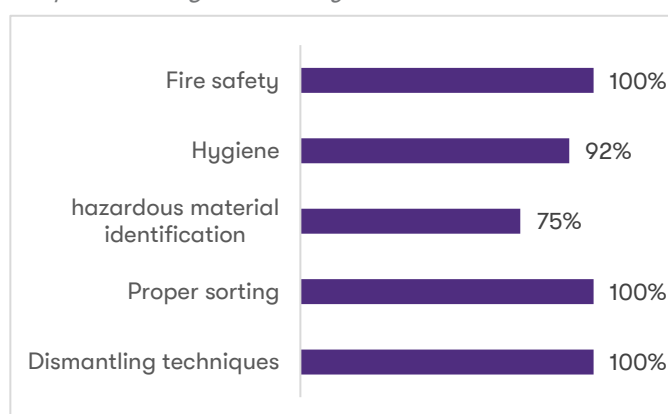
Awareness and training for trained informal workers (workers engaged at the facility)

The workers were asked whether they had received training while working at the facility. All the respondents affirmed that they had received trainings.

Further, the workers were asked to specify the type of trainings they had received. All respondents (100%) reported receiving training in dismantling techniques, proper sorting, and fire safety, while 92% received training in hygiene practices and 75% in hazardous material identification.

The workers stated that trainings have equipped them with better technical skills and enhanced their health and safety.

Graph 5: Trainings received by workers



“The trainings have equipped us with better technical skills and enhanced our health and safety”.

-Sameer, Trained informal worker

d. Environmental protection

The project places strong emphasis on protecting the environment by adopting a thorough system for managing hazardous waste. It involves careful identification and segregation of hazardous materials, followed by their safe dismantling and separation.

In addition, the project ensures that these materials are securely stored prior to being transferred to Sheetala Waste Management, the authorized Treatment, Storage, and Disposal Facility (TSDF).



Hazardous waste

Through these detailed measures, the initiative seeks to reduce environmental risks and advance sustainable waste management practices.

e. Innovation

The trained informal workers applied their prior sectoral experience in combination with the advanced tools and techniques acquired at the facility to enhance the safety and ergonomics of their tasks.

As part of this effort, they designed and fabricated a low-seating table specifically intended for dismantling fans, thereby improving efficiency and reducing physical strain during operations.



Low seating table for opening fans

f. Space rental

In FY 2024–25, multiple traders and enterprises rented space at the facility to store e-waste and for other purposes such as wire shredding. These entities also deployed their own manpower to carry out operations within the facility.

Table 7: List of entities who rented space at the facility

Name	Manpower deployed
M.M. Traders	2
S.S. Enterprise	2
A-one Traders	1
Saifi Enterprise	1
Individual (Scrap dealer)	1

The data is provided by E[co]work and covers the period for FY24-25.

g. Performance indicators

The following table presents data on the material flow of the project:

Table 8: Material flow data

Category	Quantity#
E-waste processed (self + clients)	121 MT
E-waste procured (self)	119 MT
Hazardous waste disposed of safely	3015 kg

The data is provided by E[co]work and covers the period for FY24-25.

The following table presents data on the business performance of the project:

Table 9: Business performance data

Category	Numbers achieved#
Revenue generated from material sales (self + clients)	INR 75,03,556
Revenue generated from services provided	INR 501,737
E-waste sale	75 MT
EPR credits generated	52 MT

The data is provided by E[co]work and covers the period for FY24-25.

4. Success stories

“I used to work informally at a scrap yard in Ghaziabad. A friend told me about E[co]work, and I decided to give it a try. When I reached out to the team, I was first kept on probation for a few days to test my skills. Soon after, I was formally engaged as a worker at the facility.

Here, I have learned how to properly dismantle e-waste and how to safely utilize leftover refrigerants from discarded air conditioners. I also received training on maintaining hygiene and protecting myself from physical harm while working with tools and machines. I am very satisfied with the work I am doing now, and it has raised my social standing among my peers and family.”



Name: Rizwan
Age: 22 years
A trained informal worker is now formalised and engaged at the facility.

“I wanted my students to learn about e-waste management and sustainable living, so I reached out to E[co]work in Ghaziabad. During the awareness program, our students were taught about different types of e-waste, the materials that can be recovered, and the dismantling and recycling process.

Name: Neetu
Principle, Ram
Chameli Chadha
Vishwas Girls
College, Ghaziabad

After attending the program, many of them became ambassadors of sustainable living, spreading awareness among their peers. They even organized e-waste collection drives, and the college now channels the collected e- waste to organizations like E[co]work. I am very pleased with the impact the program has had on my students and would like to engage with E[co]work again so that more of my students can benefit from this initiative.”

5. OECD-DAC analysis

Table 10: OECD-DAC analysis

DAC Principles	Analysis
Relevance	- India generates large volumes of e-waste annually, with recycling dominated by the informal sector. Unsafe practices in areas like North-East Delhi cause serious environmental and health risks, making structured interventions essential. - The project directly supports vulnerable informal dismantlers by offering safer workplaces, training, and access to formal markets, addressing both livelihood insecurity and occupational hazards. - The initiative advances SDG 8 (decent work and economic growth), SDG 11 (sustainable cities and communities), and SDG 12 (responsible consumption and production) through safer employment, reduced environmental hazards, and responsible recycling practices.
Effectiveness	- Legal requirements have been comprehensively met, enabling smooth operations. - Workers have transitioned from informal to formal employment, with improved skills, working conditions, and dignity. - Awareness and training programs reached diverse stakeholders (schools, colleges, informal sector, government agencies), fostering knowledge and behavioural change. - Facility operations demonstrate strong adherence to safety, hygiene, and infrastructure standards.
Efficiency	- The facility optimizes resources through modular workstations, organized storage, and shared infrastructure. - The space rental initiative further enhances efficiency by generating additional revenue streams and maximizing utilization of available space. - Outreach campaigns leveraged cost-effective channels (WhatsApp groups, social media, RWA engagement), ensuring wide reach with limited resources. - Training programs also provided practical skills at relatively low cost, improving employability.
Impact	- Economic: Revenue generation of over ₹75 lakh, creation of EPR credits, and stable income for workers. - Environmental: Safe disposal of hazardous waste (3,015 kg), adoption of sustainable dismantling practices, and reduced ecological risks.

DAC Principles	Analysis
	• Social: Enhanced dignity, regulated working hours, enhanced safety, and positive shifts in societal perceptions of trained workers. • Innovations such as ergonomic tools (low-seating dismantling table) further demonstrate worker-driven improvements in safety and efficiency.
Sustainability	• By embedding legal compliance, environmental safeguards, and worker welfare into its operations, the project has established a strong foundation for long-term sustainability. • Future plans to obtain refurbishment licenses and register under the Shops and Commercial Establishments Act will expand revenue streams and social benefits (e.g., refurbished devices for disadvantaged groups). • Continuous training and awareness initiatives ensure that knowledge and practices are sustained across generations of workers and stakeholders.
Coherence	• The project aligns with and complies with India's E-Waste (Management) Rules, 2022, environmental protection goals, and broader sustainability agendas. • Collaboration with like-minded educational institutions, government agencies, and community groups reinforces coherence between project objectives and stakeholder priorities.

6. Conclusion and way forward

The project demonstrates alignment with the OECD-DAC principles, addressing key gaps in e-waste management and establishing a strong foundation for systemic change. However, expanding outreach, enhancing workforce retention, and diversifying revenue streams will be essential to strengthen sustainability and long-term impact.

Going forward, Apple India may consider the following recommendations to make the project achieve maximum success.

Table 11: Recommendations

S.No.	Areas of improvement	Recommendation
1.	During the interactions with trained informal workers, it was observed that majority of the informal workers trained and engaged at the facility during FY 24-25 have since left. This might create a cycle where workers are formalized and skilled, but eventually return to the informal sector, undermining project objectives and long-term workforce stability.	It is recommended to introduce incentive structures such as skill-linked wage increments, health benefits, and recognition programs, while also providing clear career pathways for trained workers. By fostering a sense of belonging and growth, the project can reduce worker attrition and build a committed, long-term workforce.
2.	Currently, co-working spaces within the facility are being used primarily by traders and enterprises for e-waste storage. This limits the intended purpose and leaves much of the space underutilized.	To maximize the success of the project, the co-working spaces within the facility should be utilized more strategically. Repurposing these areas for training, repair and refurbishment activities (after getting the refreshment authorisation), or as innovation hubs for startups in recycling and green technology would ensure that the co-working model contributes more directly to the project's objectives while also generating diversified revenue streams.
3.	During the interactions with individuals trained in e-waste management, it was noted that currently, most of them are not employed or working in this sector. This indicates that while the training has built valuable skills, it has not translated into sustained engagement within the e-waste management sector	It recommended to align the training programs with the interests and aspirations of participants. While many individuals have received training in e-waste management, a significant proportion are not currently working in the sector, which reduces the effectiveness of capacity-building efforts. Introducing orientation sessions or interest-based screening before training, followed by specialized modules and stronger linkages to employment opportunities, would ensure that training is targeted toward those genuinely motivated to pursue careers in waste management. Building alumni networks and partnerships with recycling firms and producer responsibility organizations can further strengthen this, ensuring that trained individuals remain engaged and contribute meaningfully to the sector.

7. Annexure

List of abbreviations

CPCB	Central Pollution Control Board
CTE	Consent to establish
CTO	Consent to operate
E-waste	Electronic waste
EPR	Extended Producer Responsibility
FY	Financial year
FGD	Focused Group Discussion
GMA	Ghaziabad Management Association
GST	Goods and Services Tax
INR	Indian Rupee
IDI	In-depth interview
Kg	Kilogram
LLP	Limited Liability Partnership
MT	Metric tonne
MoEFCC	Ministry of Environment, Forest and Climate Change of India
NCR	National Capital Region
NOC	No Objection Certificate
OECD-DAC	Organization for Economic Co-operation and Development - Development Assistance Committee
PFI	Paperman Foundation of India
PPE	Personal protective equipment
RWA	Resident Welfare Association
Sq. ft	Square feet
SDG	Sustainable Development Goals
UPSIDC	Uttar Pradesh State Industrial Development Corporation
UPSPCB	Uttar Pradesh State Pollution Control Board
WHO	World Health Organisation

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Caveats

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- The information collected for this study is through field visits, meeting with various stakeholders, information shared by respondents and backend data provided by the client. We have relied on the information shared by these sources. The scope of work here does not constitute an audit or due diligence of the information shared, hence information received from the various sources was believed to be accurate.
- This report should not be considered as an expression of opinion on any form of assurance on the financial statements of or on its financials or other information.
- The recommendations provided as part of the assessment exercise may be implemented after an analysis of prioritization. The decision to implement the recommendations is the responsibility of the management of the client. Field visits were conducted in cognizance with the client, the implementing partner and field teams with prior acceptance on approach, methodology, coverage plan, survey, and tools.
- Owing to communication gap and the inherent human instinct to report everything as above-expectations and glitch-free, it was challenging to make interviewees understand the purpose of the survey and ensure that correct data was accordingly gathered. In the absence of baseline data, responses for retrospective questions are based on the respondents' ability to recall past information.
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Field pictures



Workers at the facility



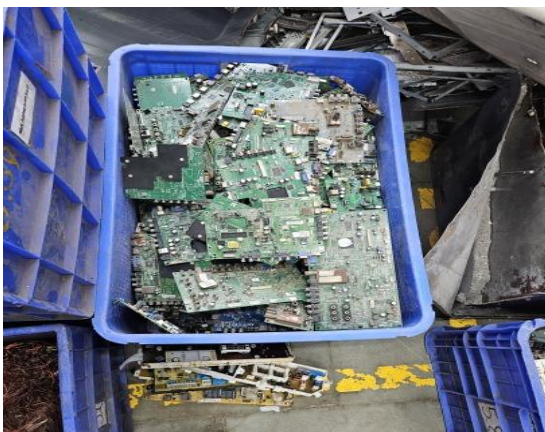
With the E[co]work team



Cutting machine



Inside view of the facility



E-waste- 1



E-waste -2