CENTRE FOR GLOBAL AFFAIRS & PUBLIC POLICY
CGAPP

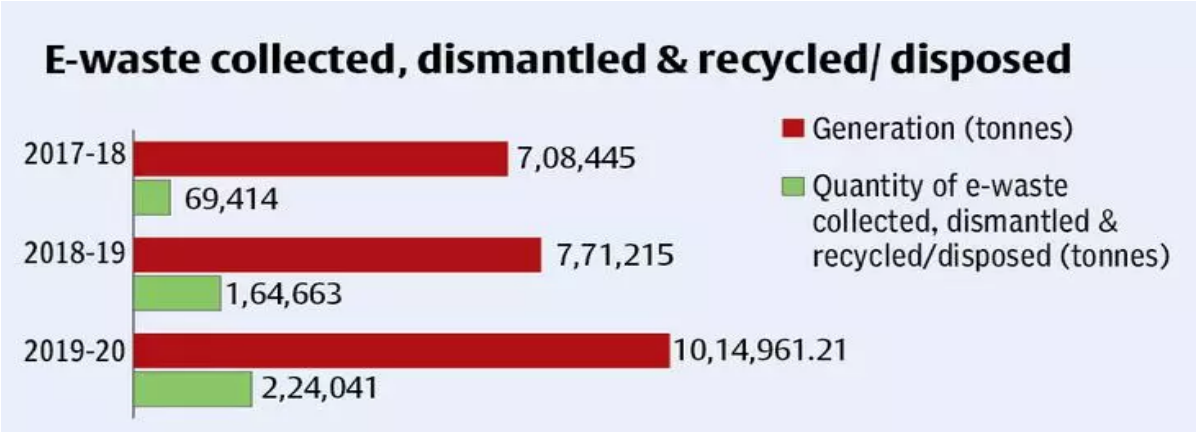
E-WASTE ROADMAP
Concept Note

Background

Electronic waste is one of the fastest-growing waste streams in the country. The growth of the ICT sector in tandem with faster obsolescence is leading to the discarding of electronics. Today, India is the world's third-biggest e-waste generator, producing over 3.23 million metric tonnes of e-waste per year, behind the US and China.[1] India's e-waste generation has risen nearly 43 % between FY18 and FY20.[2] The top contributing states are Maharashtra (19.8%), Tamil Nadu(13%), Uttar Pradesh(10.1%), West Bengal(9.8%) and Delhi(9.5%).[3]

Proper Management of e-waste is imperative for all stakeholders. Less than 25 % of the e-waste generated in India is currently being appropriately managed[4]. Only 22.7 per cent of the e-waste out of the total 10,14,961.21 tonnes generated in 2019-20 and about 21.35 per cent of the total in 2018-19 was collected, dismantled, and recycled or disposed of. Today the informal sector, composed of waste pickers, small shops functioning as unregistered recyclers etc. handles 95% of the e-waste and the rest is taken care of by a meagre 101 registered recyclers supported by Producer Responsibility Organisations (PROs). Despite handling almost all the e-waste generated, the informal sector suffers from a lack of identification and classification regarding operations and the exact role played in the e-waste management cycle. The formal sector relies heavily on the informal supply chain for quality collection and struggles to procure end-of-life electronics at competitive prices. On the other hand, practices of the informal sector are leading to environmental and health hazards due to a lack of governance and social protection.

[1] E-waste Mangement in India - CII
[2] E-waste Management in India-CII
[3] ASSOCHAM-EY Study
[4] Lok Sabha 2022



Source-Lok Sabha 2022

In a study conducted by Greenpeace in 2005, street dust samples from the informal recovery units in Delhi detected alarmingly high concentrations of lead, cadmium, mercury, tin, organochlorines, chlorinated benzenes, polybrominated diphenyl ether (PBDEs) and polychlorinated naphthalenes (PCNs) and polychlorinated biphenyls (PCBs) (PBDE, PCN & PCBs are known BFRs) compared to the ones from the other residential or other commercial areas.[5]A Toxics Link study (2014) conducted in Mandoli and Loni informal e-waste processing areas of Delhi NCR found discharging of effluents into open lands, high concentrations of mercury in surface water and change of soil characteristics.[6]

Elements	Health Impacts
Lead (Pb)	Damages central and peripheral nervous system, blood systems, kidney, causes developmental toxicity (affects brain development & central nervous system in foetus and children)
Cadmium (Cd)	Irreversible toxicity effects on human health, damages nervous system, accumulates in kidney and liver and damages kidney, bone and pulmonary systems, teratogenic (leads to birth defect), develops hypertension and heart disease
Mercury (Hg)	Chronic brain damage, developmental toxin, respiratory and skin disorders, damages kidney, liver, spinal cord, bio-accumulates in fish
Dioxins & Furans	reproductive and developmental toxicity, damage immune and regulatory hormone system
BFR	Carcinogens, alters liver function, impairs reproductive function & disrupts endocrine system, damages immune and nervous system, skin, liver, digestive tract
Hexavalent chromium (Cr) VI	Causes asthmatic bronchitis, damages DNA (mutagenic)
Beryllium (Be)	Carcinogenic (lung cancer), causes chronic beryllium disease (beryllicosis), skin disease
Barium (Ba)	Even short term exposure can cause cardiac, liver or spleen damage
Phthalates	Causes reproductive toxicity, damages liver, kidney

Health Impacts of Toxins Released in Informal Recycling

[5] Greenpeace Report
[6] Impact of E-waste recycling on Water and Soil

India's domestic demand for consumer electronics is expected to touch $21.18 billion by 2025[7]. The government aims to make electronics among the top three exports from India by 2026 and hence has brought in policy changes for enabling and regulating the sector. The ecosystem has been established with the introduction of E-Waste (Management) Rules 2022 along with Battery Waste Management Rules 2022. However, the rules have not had the transformative impact envisaged. India recycled only 32.9% of the e-waste generated in 2021-2022 according to data from the Ministry of Environment, Forest and Climate Change.[8] While this is still an increase over previous years, it indicates that certain aspects of the problem are not being addressed. There is a lack of framework for facilitating refurbishing as government and corporate policies favour disposal over repair. They have been disincentivized by high customs and GST. Design standardization, redesign of products, transparency about elements in electronics and green manufacturing are some missing aspects of the policy. Despite a huge hoarding problem, consumer responsibility has been given a miss. Draft National Resource Efficiency Policy 2019 focuses on the missing aspects of the current policy ranging from the responsibility of stakeholders, standards for longevity, platform for secondary material and much more. A revisit to the draft policy will help in closing critical gaps in the current scheme of things.

India is the third largest consumer of resources globally. If current economic trends persist then India's material requirements are projected to be nearly 15 billion tonnes by 2030 and a little above 25 billion tonnes by 2050.[9] On the contrary,India disposed of 728 kilotonnes (kt) Iron, 96.8 kt copper, 110.6 kt Aluminium, 71 tonnes silver, 22 tonnes gold and 9 tonnes palladium in 2016. That means, the country discarded gold and silver worth Rs 6,347 crore and Rs 300 crore.[10]

For India to fulfil its resource needs, we must follow a circular economy approach rather than the current linear economy principle of take-make-dispose. Cross-industry and stakeholder partnerships are crucial in implementing a sophisticated circular strategy to address e-waste. Partnerships and a policy framework will revive the lost value of resources and help boost the economy.

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7 https://www.investindia.gov.in/team-india-blogs/indias-emergence-global-electronics-manufacturing-hub

8 https://indianexpress.com/article/world/climate-change/recycling-gone-up-last-5-years-67-e-waste-remains-unprocessed-8530613/

9 Circular economy in electronics.Meity

10 Global E-waste monitor, ITU

Current Landscape of E-waste in India

Informal Sector

India's informal sector plays a crucial role in the management of e-waste as it handles around 95% of it. However, they aren't officially recognised, lack a legal status and protection. They often collect e-waste without protective equipment and manage it without any safety procedures.

Under the new E-waste 2023 rules, the informal sector hasn't been recognised. Many informal aggregators fear their business operations will be negatively impacted in the forthcoming years due to enforcement of the new regulation. Lack of knowledge and technical know-how is hindering the sector in formalisation.

Recyclers

India has 101 registered recyclers with CPCB with a combined capacity of 10,19,759.62 MT/year under CTO. The majority of recyclers aren't functioning at full capacity given the shortage of quality supply. Recyclers don't have the infrastructure to process all kinds of waste, thus leading to sub-contracting to informal processors.

Recyclers are facing teething troubles with the implementation of the new rules. They are walking a tightrope with the targets set by the government. Small recyclers are struggling to meet the material recovery requirements. The lack of advanced technology and current technology being limited to a few categories of e-waste is hindering the growth of recyclers.

Refurbisher

Right to Repair was introduced by the Ministry of Consumer Affairs to facilitate repair and extension of product life. It mandates the manufacturer to disclose product details to ease the repair.

However, very few producers have been transparent, often withholding product details. As a result, Refurbishers lack knowledge of repairing new electronics and also face a shortage of skilled technicians. Refurbishers are limited by the planned obsolescence of the manufacturer and the limited capability of assuring warranties. They are disincentivised by the customs charges and GST. Corporate and government policies favour disposal over repair leading to a major chunk of ICT waste being disposed of.

Producer

The E-waste Management Rules 2016 introduced the Extended Producer Responsibility for the implementation of a take-back system for the electronics placed in the market by the producer. These EPR targets act as viability gap funding for the recyclers and have supported the formal supply chain. The producer is also mandated to deal with a registered recycler/dismantler for disposal.

However, many producers end up disposing of their electronics to the informal aggregators in lieu of better prices. They are also not focusing on redesigning their products for easier disassembly or longer life.

Producer Responsibility Organisations
PROs form a crucial link between the consumer and recycler. They are involved in door-to-door collection and dismantling. Many of them are startups competing with the informal supply chain.

With the introduction of E-waste rules 2023, the license requirement of PROs has been dropped. Bulk consumers are under no obligation to dispose of their waste to PROs. This has impacted their business vehemently. It also limits the quality supply to the recycler.

Consumers
Households form 15% of the Waste Electrical and Electronics. This share of electronics is largely hoarded given the lack of information on disposal, data safety, emotional attachment and future reuse.

E-waste rules have failed to introduce any responsibility on the consumer to dispose of WEEE. This makes it difficult for PROs and recyclers to meet their collection targets.

Report from the Ground: Mustafabad

Delhi has multiple hotspots for e-waste processing. One among them is Mustafabad in North-east Delhi. It accounts for 15% of the informal e-waste processing and handling units in Delhi. These units operate out of residential and commercial spaces in poor hygienic conditions and do not comply with environmental norms.

Formal-informal setups in Mustafabad are performing trading, dismantling, segregation of components, repairing, refurbishing, metal recovery & recycling. These processes are undertaken by a hierarchy of stakeholders.

Approximately 100 aggregators are collectively running the entire hotspot. These aggregators belong to the same kinship group and have been doing this for two generations. They have developed a strong network and are responsible for logistics and collecting electronic waste from various parts of the country. This econis flourishing not just on finances but also because of the mutual trust the aggregators enjoy due to their kinship bonds. Over 1000 smaller processing units support the aggregators. These units specialise in products ranging from headphones, mobiles, and motherboards to certain hazardous substances. Every processing unit is further connected to refurbishers and resellers. Many aggregators are further selling the waste to formal recyclers after the extraction of valuable materials. Many a time, formal recyclers subcontract waste to these informal units. They have a complete ecosystem in place which is employing over 20,000 people.

Policy interventions so far have been trying to introduce a new set of players who are to be responsible for collection, processing and disposal. Instead, a comprehensive solution is to shift the entire chain of stakeholders of this hotspot to a formal unit. The community leaders have shown interest in such a solution as it saves them from raids and closures due to non-compliance with environmental norms. They also believe it will eliminate the fear of regulation and allow the traditional players to thrive. This solution will significantly improve the quality of life for over 80, 000 people.

INTERVENTIONS PLANNED BY CGAPP

CGAPP seeks to bring together national and international stakeholders in the e-waste sector. International Telecommunications Union (ITU), is interested to hold a one-day co-creation workshop through the ITU innovation centre as part of the CGAPP consultation in early 2024. The workshop would focus on understanding the roles and opportunities of start-ups, recyclers, regulators, and other stakeholders in India in the context of the e-waste management rules and regulations and thereby enable identification of challenges and opportunities. India Accelerator Impact Labs, an accelerator program in association with UNTILs (United Nations Technology Innovation Labs), also seeks to be part of the CGAPP consultations in order to gain insights into the e-waste sector and the various players involved. Our overall goal is to provide perspectives from the ground and enable informed policy recommendations and consultation to the diverse parties in e-waste management.

1. **Facilitate Stakeholder Connections**
2. **Provide Policy support through advocacy**
3. **Enable Knowledge and Tech transfer**
4. **Support Startups and Businesses in market expansion**
5. **Ecosystem creation for the informal sector**
6. **Nudge consumers towards behaviour change**
7. **Conduct a Study to understand the extent of informalisation in the sector and represent their voice to government**

RISKS AND MITIGATION

Intervention	Anticipated Risks	Mitigation Measures
Project Risks (Applicable to all Interventions)	● Scope risk ● Schedule risk ● Performance risk ● Cost risk ● Resource risk ● Legal and compliance risks ● Technology risk	● Robust scope definition along with change control process. ● Regularly monitor progress and have a contingency plan ● Define roles and responsibilities clearly, update data and analytics and monitor deliverables. ● Monitor expenses and implement cost-control measures. ● Develop resource allocation strategies, maintain open communication with stakeholders and have backup plans. ● Maintain an understanding of laws and have documentation in place. ● Regular system testing, updating technological features and implementing security measures.
Policy Research	● **Social risks and financial harm** through disclosures affecting the participant's standing in the community or job ● **Health and safety risks** to the researcher	● Adhering to the confidentiality of the research subject. ● Use of safety tools and communication of distress or any symptoms.
Stakeholder Connection	**Communication Risk** ● Different interests, opinions and goals ● Lack of trust and commitment ● Lack of coordination and communication ● Inaccurate information delivery	● Understand the audience and their interests ● Establish a communication vehicle for consistent updates. ● Set up a communication plan for engagement amongst stakeholders. ● Verification through documented sources and identification of gaps in current data gathering

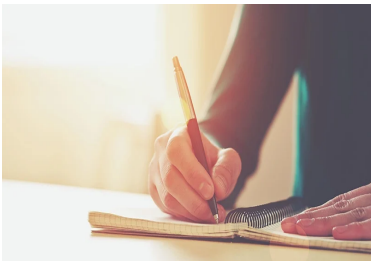
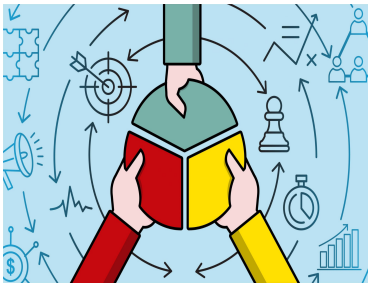
Startup Cohort	**Quality Risks** ● The products promoted in the market can be subpar. **Market Risks** ● Demand fluctuations and competitive prices ● Suppliers, vendors and subcontractors not fulfilling commitment. ● Procurement challenges.	**Quality Mitigation** ● Develop a quality management plan, performance measure thresholds and independent quality checks. **Mitigate Market Risk** ● Understand Value at risk ● Statistical risk management ● Identification of bottlenecks and contingency plans for the same.
Ecosystem Creation for Informal sector	**Policy Risk** ● Shift in government policy causing disruption	● Anticipating expected policy changes and encouraging business models adaptable to regulatory changes
Behaviour Change	**Communication Risk** ● Lack of clarity in messaging ● Conflict with the community members **Manpower Risk** ● Lack of skill in communicating the message	**Mitigate Communication risk** ● Involvement of experts in material creation ● Establish an SOP in case of conflicts and train the supervisor in resolution methodologies. **Mitigate Manpower risk** ● Train the personnel involved in awareness activities and conduct periodic reviews of communication effectiveness.
Study on Informalisation	● **Physical and psychological risks** because of exposure to pollution and unhygienic conditions ● **Social risks** such as disclosures affecting the participant's standing in the community or job	**Mitigate physical & psychological risks** ● Understanding the physical and mental state of the researcher to avoid any triggers and use safety tools for physical research. **Mitigate Social risks** ● Adhering to the confidentiality of the research subject.

Tech and Knowledge transfer	**Communication risk** ● Miscommunication due to the difference in standards and language. **Cultural risk** ● Different market and firm culture leading to implementation failure	**Mitigate Communication Risk** ● Understand the language barrier ● Understanding cultural differences and facilitating clear communication

Roadmap

Phases	Duration	Activity
Outreach	Oct 23-Nov 23	• Stakeholder Identification • Identify stakeholder needs and challenges
Informal sector Consultation	Dec 23-10 Jan24	• Site visits to top five E-waste processing hubs in NCR • Consultation with informal sector in Jan24
Stakeholder Meet	Dec 23-Jan24	• In-person meeting with all stakeholders to identify areas of intervention • ITU meet with stakeholders to explore synergies - Informal sector consultation session a part of the meet
Publication and preparation of cohort	Feb 24 - Mar 24	• Publication of a co-authored policy piece on E-waste challenges in India along with suggestions • Project planning of cohort services • Onboarding partners
Launch of Cohort	April 24	• Launch and Screening • Assign roles and responsibilities
Execution	May 24-Oct 24	• Deliver against the project plan • Manage risks and issues • Implement change control processes • Ensure roles and responsibilities are maintained • Monitor Budget • Maintain progress reporting • Multi-stakeholder summit on E-waste(June)
Review	NOV 24	• Identify improvements for the future • Identify strengths and weaknesses • Evaluate against objectives

Deliverables

		
Policy Piece A comprehensive report highlighting the stakeholders' challenges and policy suggestions for ecosystem shift.	**Stakeholder Engagement** Identification of stakeholders, mapping of their needs and realising the role of ITU in filling the gaps.	**Cohort** Facilitate opportunities for identified stakeholders.