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EPR AWARENESS, BUSINESS COMPLIANCE AND CIRCULAR ECONOMY PRACTICES IN E-WASTE MANAGEMENT: EVIDENCE FROM TAMIL NADU, INDIA

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Abstract
The rapid digitalization of economies has transformed electronic waste (e-waste) into a key sustainability and management issue for businesses, regulators, consumers and all other stakeholders. The growing adoption of electronics, coupled with the rapid turnover of products and the inconsistent enactment of Extended Producer Responsibility (EPR), has heightened worries in Tamil Nadu regarding regulatory compliance, resource recovery, and sustainable practices. The study investigates e-waste management in Tamil Nadu from three angles – business activity, stakeholder participation, and policy making with special focus on EPR awareness, compliance of stakeholders, involvement of informal sector, and circular economy opportunities. A mixed methods research approach was followed with survey analysis of households, small electronics businesses and IT businesses as well as semi-structured interviews with regulatory officials, certified recyclers, informal sector workers, and non-governmental organizations. The results have indicated that there is a lack of source separation, formal recycling, stakeholder awareness, infrastructure and regulation enforcement. The analysis also shows that businesses are considerably more compliant with respect to e-waste if they are more concerned of the requirements of EPR. The study emphasizes the importance of fostering institutional coordination, business–government partnerships, enabling formalization of informal collectors, and implementing circular business models through reuse, refurbishment, reverse logistics and resource recovery. The research results can inform managers, policymakers, recyclers, and businesses looking to enhance the sustainable management of e-waste and the circular economy.

Keywords: *Electronic waste Management; Extended Producer Responsibility; Circular Economy; Business Compliance; Sustainable Business Practices*

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1. Introduction

Rapid digitalization, technological innovation, reduced life cycles of products and increased consumption of electronics have led to e-waste becoming one of the world's fastest-growing waste streams. Globally, the amount of discarded electrical and electronic equipment (WEEE) has generated significant problems in conserving resources, responsible production and sustainable economic development (Forti et al., 2020). The growing reliance on electronic products and the rise of electronic consumption in India has created a huge amount of e-waste and put pressure on the formal collection and processing systems (Bagwan, 2024. Recent studies also show that the e-waste processing capacity needs to be scaled up significantly to meet future e-waste generation trends (Bagwan, 2024).

In a business-management context, e-waste is not only an environmental disposal issue, but a corporate responsibility and regulatory compliance issue as well as an issue of operational efficiency, resource utilization and sustainable supply-chain management. The production, distribution, consumption, refurbishment and recycling of electronic products is increasingly taking place in a regulatory landscape, where a higher level of accountability is needed for the products across their life cycles. This is reinforced with the introduction of Extended Producer Responsibility (EPR) in India's E-Waste (Management) Rules, which impose obligations on producers and other stakeholders to ensure the environmental responsibility of end-of-life electronic products (Nosova et al., 2024). While there has been significant progress in the regulation of e-wastes, some significant gaps in collection, infrastructure, enforcement and institutional coordination have always hindered effective implementation in India (Secretariat, 2011).

These problems are of significant concern to business organizations. The risk of compliance may be elevated, resource-recovery opportunities may be constrained, and organizations may be unable to integrate an environmental approach into their operation and supply chain. Despite the positive developments in the Indian e-waste sector, there are still challenges related to the collection systems, recycling processes, stakeholder engagement, and formal and informal sector integration. The wider evaluations come to a similar conclusion that effective e-waste management will only happen with improvements in e-waste governance, infrastructure, awareness, and institutional frameworks, and not with end-of-life disposal alone (Kaushik & Herat, 2020). Thus, e-waste management issues for organisations are becoming more prominent for managers dealing with compliance, procurement, operations, sustainability, and supply-chain management.

An important strategic framework to respond to these concerns is the circular economy, which aims at changing business models to move away from linear consumption and disposal toward reuse, repair, refurbish, recycle and resource recovery (MacArthur Foundation, 2013). Thus, e-waste management can offer a chance for organizations to enhance resource efficiency, adopt circular business models, and foster strong relationships with stakeholders and sustainable development (Raghunandan et al., 2024). Business actions are especially crucial for turning e-waste from a liability to an economic, environmental and strategic asset, and for that, organizational commitment is paramount (Anuardo et al., 2023). However, India still faces structural and institutional issues in putting these opportunities into effective practices of e-waste management (Bhagat-Ganguly, 2021).

These are very relevant to Tamil Nadu, given its industrialisation, urbanisation, electronic consumption and business activity which demand for the need of e-waste governance to be effective. The evidence shows that organizations in the state are facing multiple challenges to adopt circular-economy practices for managing e-waste, highlighting the need for strengthening of organizations' capacities, coordination of stakeholders, and supportive institutional mechanisms (Mahanth et al., 2023).

While there is increasing research on e-waste management in India, there is a dearth of empirical studies that focused on the combined effect of the organizational EPR compliance, managerial and stakeholder awareness, stakeholder integration, and circular-economy adoption in Tamil Nadu. Current studies have focused mainly on environmental, technical and disposal issues, and there is still a lack of knowledge about e-waste as an issue of business management and organizations. This is particularly significant in determining what businesses can do to enhance their regulatory obligations, adopt sustainable business practices, and effectively engage in circular e-waste economies.

Objectives of the Study:

- To assess e-waste and EPR awareness and compliance practices among business and stakeholder groups in Tamil Nadu.
- To examine the relationship between organizational and stakeholder characteristics, awareness levels, and e-waste management and compliance behaviour.

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- To identify managerial, regulatory, and stakeholder-integration challenges and evaluate opportunities for strengthening circular-economy-oriented e-waste management practices in Tamil Nadu.

2. Literature Review

Electronic waste (e-waste) management has grown from being an environmental issue to a key business-management one for companies related to corporate responsibility, regulatory compliances, operation efficiency, and sustainable resource utilization. There is an increasing responsibility on organizations indulge in the production, division, use and recycling of electronic products, to manage products throughout their life cycles. Anuardo et al., (2023) highlights that by managing e-waste effectively, organizations can contribute to sustainable development and sustainability while turning environmental issues into opportunities. However, in India, the collection systems are still fragmented, there is a lack of infrastructure, informal recycling and several barriers in implementation are hindering the effective e-waste management (Bhagat-Ganguly, 2021).

2.1 Sustainable Operations and EPR Compliance

Organizations need to incorporate environmental factors in purchasing, manufacturing, usage, reverse logistics, recycling, and resource-recovery decisions to operate sustainably. In e-waste management this refers to the transition from the traditional disposal methods to the systematic collection, refurbishment, recycling and recovery of valuable materials. Producers' responsibility is also prolonged to the post-consumer stage of electronic products, further enhancing the accountability of organisations. Managerial awareness, formal compliance mechanisms, traceability, partnerships with authorized recyclers and organizational commitment are therefore essential elements to good EPR implementation. From a management perspective, it is crucial to have EPR compliance, as it can be a risk for organizations if they fail to comply and can limit opportunities for resource recovery. In India, as well, there are complicated formal and informal e-waste networks. This integration can be done through training, certification, partnerships and digital traceability and can help to make collection more efficient and help with compliance and coordination of stakeholders.

2.2 Circular Economy and Sustainable Supply Chains

Circular-economy principles offer businesses the chance to change the traditional linear ‘take–make–dispose' approach to reuse, repair, refurbish, recycle and resource recovery. Thus, e-waste can be considered not only as burden to waste-management, but also as a possible source of economic value. Raghunandan et al. (2024) link e-waste management with the circular-economy transition and Prasath et al. (2020) present business opportunities that are derived from e-waste recovery and management. With a similar perspective, Mudali et al. (2021) refer to e-waste recycling as an opportunity of urban mining for the recovery of valuable secondary materials. Sustainable practice in the supply chain is also essential for circular practices. Reverse logistics is a chain of activities that links consumers, companies, collectors, refurbishers, recyclers and producers to bring back end-of-life products and materials for productive use. Infrastructure, managerial capacities, institutional supports, economic incentives and participation of stakeholders, however, influence adoption. In Tamil Nadu, Mahanth and his colleagues (2023) point to several barriers in relation to circular economy approaches to e-waste management, noting that technological solutions cannot be achieved unless there is organizational and institutional support.

2.3 Theoretical and Conceptual Framework

The research is based on the concepts of Stakeholder Theory, Institutional Theory and Circular Economy. Stakeholder Theory views e-waste management as a multi-stakeholder system, where the stakeholders are businesses, consumers, regulators, and e-waste collectors (both formal and informal), NGOs, and local authorities. Through effective stakeholder integration, information sharing, collection efficiency, regulatory compliance, and responsible recycling can be enhanced. Institutional Theory describes the impact of regulation, EPR commitments, government enforcement and industry expectations and stakeholder pressures on the behavior of organizations. However, larger awareness of the managers and EPR is likely to lead to more effective response to such institutional pressures by employing stronger compliance practices. The Circular Economy perspective then provides an overview on how the compliance of the organizations and collaboration between the stakeholders can support reuse, refurbishment, reverse logistics, recycling, and resource recovery. Accordingly, the proposed conceptual relationship is:

Managerial/EPR Awareness → Organizational Compliance → Stakeholder Integration → Circular-Economy Practices → Sustainable Organizational Outcomes

The framework proposes that greater awareness strengthens organizational compliance, while stakeholder integration facilitates circular practices. These practices can ultimately contribute to improved resource

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efficiency, regulatory performance, operational effectiveness, corporate environmental responsibility, and and organizational sustainability. The framework therefore provides a business-management foundation for examining variations in awareness, compliance, stakeholder participation, and e-waste management practices in Tamil Nadu.

3. Methodology

3.1 Research Design

This study uses mixed-methods research design which combines quantitative and qualitative approach to get a comprehensive understanding of e-waste management from the business, organizational, and stakeholder's perspectives. The quantitative part was used to measure the patterns of e-waste awareness, e-waste disposal behaviours, compliance of organizations and the difference between the respondent groups. The qualitative part of the research was used to add to the statistical analysis by gathering the stakeholders' viewpoints regarding: the situation of regulating the sector, the occurrence of the informal sector, recycling practices, and institutional issues. Thus, the mixed method design is suitable for the study to explore the measurable behavioural and organisational pattern and to understand the contextual factors in the e-waste management practices in Tamil Nadu.

3.2 Study Area

The study was accomplished in the city of Chennai, Tamilnadu. The city of Chennai was chosen for its high urbanisation, usage of electronics, commercial activities and presence of businesses and IT companies. The city is also relevant in the context of understanding e-waste management from organisational, regulatory and circular economy perspectives as the presence of formal recyclers, informal e-waste collectors, regulatory institutions and other stakeholders make for diverse context for e-waste management. Thus, the geographical focus offers a suitable context for assessing awareness, compliance, disposal behaviour and stakeholder practices, to identify differences.

3.3 Study Population and Sample

The quantitative survey included three key respondent groups 150 households, 30 small electronics companies and 20 IT companies in Chennai. The quantitative sample respondents, therefore, comprised 200 household and organizational respondents. The semi-structured interviews were conducted with 5 officials of Tamil Nadu Pollution Control Board (TNPCB), 5 certified e-waste recyclers, 10 informal-sector (kabadiwalas and scrap dealers) and 5 representatives of NGOs involved in waste management. The multi-stakeholder nature allowed for the study to be rich in the consumer, organizational, regulatory, formal recycling, informal-sector and civil-society voice. The manuscript doesn't mention the sampling technique, the respondent recruitment procedure, the inclusion criteria or the response rate. All the methodological details should be reported in the final manuscript in the way they were performed in the actual process of data collection.

3.4 Data Collection

A structured questionnaire was used for collecting primary quantitative data from the households, small electronics companies and the IT companies. The questionnaire provided data on e-waste awareness, e-waste disposal, household characteristics, occupational differences, awareness of EPR and compliance of the organization. These were later analysed using descriptive and inferential statistical methods. Semi structured interviews were directed with participants from the regulatory bodies, certified recyclers, the informal sector and NGO representatives to gather qualitative information. The interviews yielded contextual evidence on regulatory implementation, recycling practices, stakeholder coordination, infrastructure constraints, the existence of the informal sector, and potential for sustainable management of e-waste. Secondary information was sourced from policy documents, reports by TNPCB, CPCB and MoEFCC, academic literature, case studies and select media reports.

3.5 Measurement of Variables

The awareness of e waste was analysed by having two categories of respondents; conscious of e-waste hazards and not aware of e-waste hazards. Four disposal practices—disposal in municipal bins, sale to kabaddi Walas, disposal using authorized recyclers, and storage at home of obsolete electronic products—were reported to assess the disposal behaviour among households. Household size and e-waste generation were studied to find the differences in the amount of e-waste created in each household size category; occupation was studied to find the differences in e-waste awareness in each occupation category. At the organisational level, EPR

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awareness and e-waste compliance were explored by analysing the compliance score of business groups with varying levels of EPR awareness. The construction, number of items, scoring procedure and the response scale of the e-waste compliance score are not given in the existing manuscript. The methodology should include these details related to the original questionnaire, so that the organizational compliance measure can easily be understood and replicated.

3.6 Reliability and Validity

Reliability and validity are crucial in determining the consistency and suitability of measurements using questionnaires. But pretest of questionnaires, pilot test, expert validation, internal-consistency reliability and construct-validity procedures are not reported in the current manuscript. So, it is important to never introduce an indication of numerical reliability or validity without data. When such procedures were performed in the original study, the development process of the questionnaire, pilot testing/expert assessment, and appropriate reliability measures (for multi-item constructs) should be reported in the final manuscript.

3.7 Data Analysis

Descriptive statistics, frequency distributions, cross-tabulations and inferential statistical tests were used for the analysis of quantitative data using SPSS. Chi-square analysis was employed to test the association between awareness and disposal behaviour, and the association between occupation and awareness of e-waste. One-way ANOVA was used to analyse intergroup difference in e-waste generated by different household size categories; and independent-samples t-test was conducted to analyse intergroup difference in e-waste compliance in relation to different level of e-awareness in business groups. Reported hypothesis testing was done with a .05 significance level. Thematic coding and content analysis were used to analyse qualitative data gathered via the interviews with the stakeholders. This was done to find regularities in terms of regulatory issues, involvement of stakeholders, informal sector integration, recycling infrastructure, and opportunities to create a circular economy-oriented e-waste management process.

3.8 Data Consistency and Analytical Transparency

This quantitative analysis needs to be clarified and be submitted. The study mentions a household sample of 150 respondents but shows only 15 observations in the household-size analysis (five observations per household-size group). The final manuscript should indicate if these observations are for a subsample or another analysis. Where full household level observations are made, the analysis should use all the eligible cases. Another consistency issue has to do with how households dispose of waste. One of the descriptive results reports that 43.3% of households dispose of e-waste in the municipal bins, while later on, it is said that 62% dispose of e-waste with the municipal garbage. These numbers should be checked against the original set and corrected or distinguished if they are two different measures. Several of these must be addressed to achieve consistency in methodology, statistical analysis and results reported.

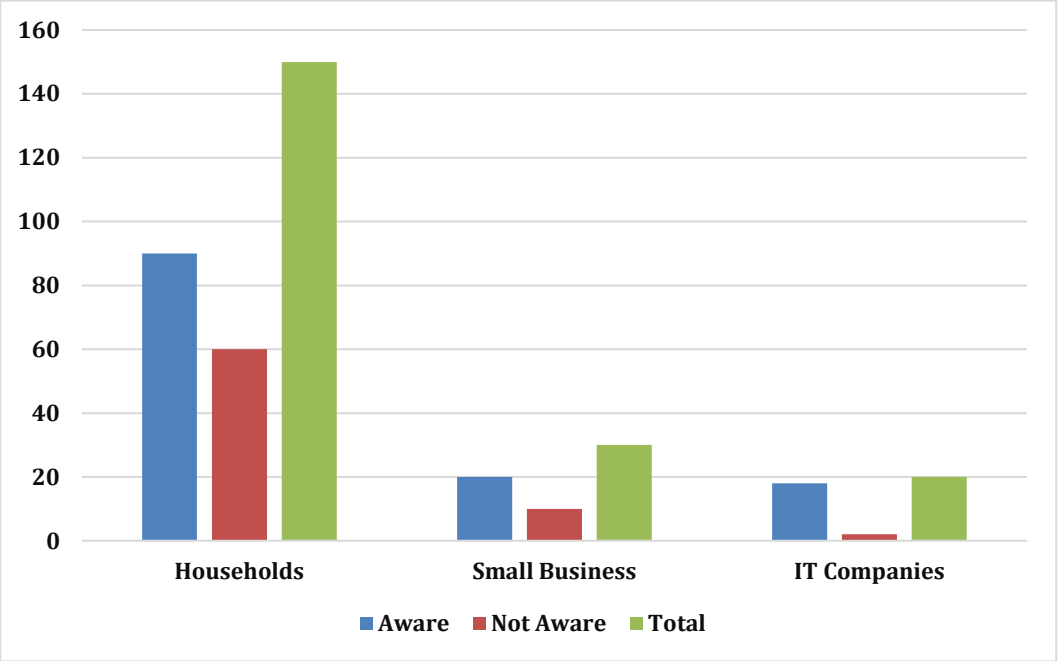
4. Results

4.1 Awareness of E-Waste Hazards Among Stakeholders

The level of cognizance about the hazards of e-waste was examined across three key stakeholder groups: households, small businesses, and IT companies.

Key Groups	Aware	Not Aware	Total
Households	90	60	150
Small Business	20	10	30
IT Companies	18	2	20

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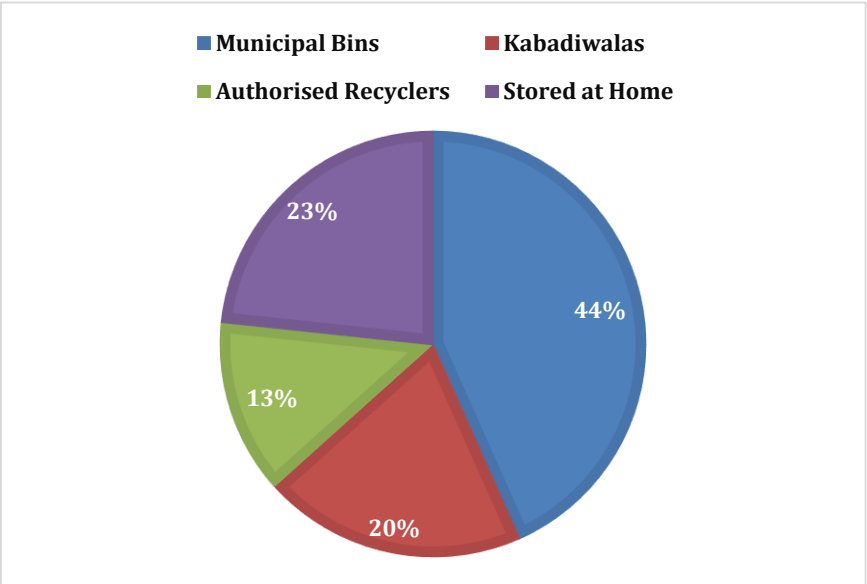


The results show that 90 out of 150 households were aware of e-waste hazards. Among small businesses, 20 out of 30 respondents were aware, while 18 out of 20 IT companies reported awareness.

4.2 E-Waste Disposal Methods Among Households

The disposal methods adopted by households are presented below.

Disposal Methods	% of Households
Municipal Bins	43.3%
Kabadiwalas	20%
Authorised Recyclers	13.3%
Stored at Home	23.3%



The findings indicate that 43.3% of households dispose of e-waste in municipal bins, 20% sell e-waste to kabadiwalas, 13.3% use authorised recyclers, and 23.3% store obsolete electronic products at home.

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4.3 Cross-Tabulation of Awareness and E-Waste Disposal Method

Disposal Method	Aware	Not Aware
Municipal Bin	35	30
Kabadiwala	20	10
Authorized Recycler	15	5
Storage at Home	20	15

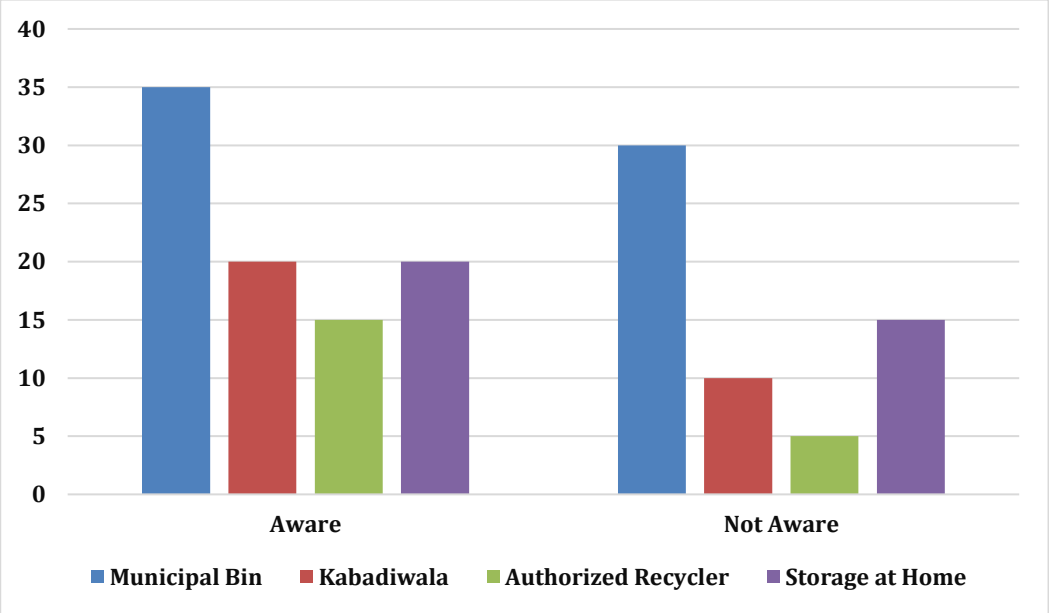


Chart: Awareness vs Disposal Method

Households aware of e-waste hazards were more likely to use authorized recyclers or kabadiwalas. Those who were not aware were more likely to place of e-waste through municipal bins or store obsolete electronic products at home.

4.4 Hypothesis 1: Awareness and Disposal Method

H_0: There is no significant relationship between awareness and disposal method.
H_1: There is a significant relationship between awareness and disposal method.

Statistic	Value
Chi-Square Statistic	3.575
Degrees of Freedom (df)	3
P-value	0.3111
Significance Level (α)	0.05
Hypothesis Conclusion	Fail to reject H_0

Since the p-value of 0.3111 is greater than the significance level of 0.05, the null hypothesis is not rejected. The results therefore indicate that there is no statistically substantial relationship between awareness level and e-waste disposal method in the sampled population.

4.5 Hypothesis 2: Household Size and E-Waste Generation

H_0: Household size has no significant effect on the volume of e-waste generated.
H_1: Household size significantly affects the volume of e-waste generated.

Household Size	E-Waste Volume (kg/year)
1–2 Members	2, 3, 2.5, 3.1, 2.7
3–4 Members	4, 4.5, 5, 4.8, 5.2
5+ Members	6.5, 6.8, 7.1, 7.5, 7

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A one-way ANOVA was managed to examine whether significant differences existed in e-waste volume across the household-size groups.

Statistic	Value
F-Statistic	24.21
P-Value	0.00002
Significance Level	0.05
Conclusion	Reject H_0

The results indicate a statistically substantial difference in e-waste generation across household-size groups. Larger households were found to generate greater volumes of e-waste.

4.6 Hypothesis 3: Occupation and E-Waste Awareness

H_0: There is no significant relationship between occupation and e-waste awareness.
H_1: There is a significant relationship between occupation and e-waste awareness.

Statistic	Value
Chi-Square Value (χ^2)	23.763
Degrees of Freedom (df)	3
P-Value	0.0000
Significance Level (α)	0.05
Conclusion	Reject H_0

The results indicate a statistically significant relationship between occupation and awareness of e-waste. Certain occupational groups, particularly IT professionals, demonstrated higher levels of awareness compared with other groups.

4.7 Hypothesis 4: Business Type and E-Waste Compliance Score

H_0: There is no significant difference in e-waste compliance scores between high and low EPR-aware businesstypes.
H_1: There is a significant difference in e-waste compliance scores between the two groups.

Statistic	Value
T-Statistic	12.840
P-Value	0.0000
Significance Level (α)	0.05
Conclusion	Reject H_0

The results indicate a significant difference in e-waste compliance scores between the two groups. Businesses with higher EPR awareness, such as IT firms and recyclers, showed higher e-waste compliance scores compared with businesses with lower awareness, such as retail and small-scale manufacturers.

4.8 Challenges Identified

The results revealed there are many challenges to be addressed for e-waste management. However, a lack of source separation was still a major concern with 62% of households saying that they disposed of e-waste in municipal waste. The informal sector was also, to a large extent, the dominant one, with 75% of the scrap dealers surveyed saying they dealt with e-waste without any personal protective equipment, and lack of awareness of the toxic risks involved. Poor formal infrastructure was also a significant problem, as out of the 26 formal recycling units that were reportedly operating in Tamil Nadu, the majority were in the urban areas. Small electronics businesses were also found to be less aware of Extended Producer Responsibility, with 18% claiming to be aware of their responsibilities under the E-Waste Rules. Policy issues included lack of coordination between urban local bodies, and slow implementation of the regulatory framework of 2022. However, the economic viability was also seen as a concern, as recycling low value materials was reported to be unprofitable.

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4.9 Opportunities and Innovations

The findings also pinpointed several e-waste management improvement opportunities. One of the potential ways to formalize the informal sector was identified as being through cooperatives, certification, training and other digital traceability systems. It was also emphasised that Public Awareness Programmes such as School- and community-based programmes are to be promoted. Another opportunity for improving collection and monitoring is smart waste-management infrastructure – smart-bin facilities and RFID-based tracking. Circular-economy solutions like refurbishment centres, product-life extension, reuse and resource recovery were also recognized as potential strategies to achieve sustainability benefits and job creation.

5. Discussion

The results reveal that stakeholder awareness, disposal practices, organizational compliance, regulatory measures, and availability of formal e-waste recycling infrastructure are crucial factors influencing e-waste organisation in Tamil Nadu. From a business-management point of view, it suggests the need for more responsibility and coordination between businesses, consumers, recyclers, informal actors and institutions from a regulatory perspective.

The awareness level was not the same among the different stakeholder groups, IT companies having the highest awareness, followed by small businesses and households. The chi-square analysis, however, revealed that there was no statistically substantial relationship between household awareness and disposal method ($\chi^2 = 3.575$, $p = .3111$). Therefore, raising awareness might not be enough to ensure responsible disposal behavior. Practical issues like accessibility of authorised collection centres, convenience, financial considerations and existing rapport with informal collectors may also affect disposal decision-making. This aligns with Sivagami and Ram (2020) who looked at consumer awareness towards the e-waste management in Chennai and said that it is important to understand the awareness in the wider context of consumer practices.

Occupation also revealed a significant relationship with e-waste awareness ($\chi^2 = 23.763$, $p < .001$) thus indicating that the occupation of the stakeholders is a factor that affects awareness about responsible e-waste management. The greater awareness of IT-related respondents could be a consequence of their professional exposure to electronic equipment and technology-based working environment. Research on e-waste disposal and management in Chennai has also revealed significant issues related to the management of e-waste in the urban context (Cundill et al., 2012). Community-based initiatives can thus be used to support organizational interventions to enhance participation of stakeholders and responsible disposal practices (Leknoi et al., 2024).

An interesting business-management result is that compliance scores differed significantly between those businesses with high and low EPR awareness ($t = 12.840$, $p < .001$). Compliance was higher among businesses that were more aware of EPR, specifically IT businesses and recyclers. This discovery indicates that regulatory expertise can be a significant organizational capability that can assist in responsible e-waste practices. More generally, in the Indian context, implementation, governance and institutional shortcomings are reported to be ongoing obstacles to effective e-waste management (Biswas et al., 2020). From an institutional point of view, the communication of the regulations, monitoring of compliance and training of the organization might therefore help to ensure better business response to the EPR requirements.

The conclusions about the informal sector participation are also crucial. Established collection networks exist; however they may lack safety practices and/or be informally run. Stakeholder-approaches to management strategies might include certification, training, formal collaboration with recyclers and digital traceability, instead of excluding actors. Further technological advancements could enhance collection efficiency and coordination, especially when digital tools are effectively integrated into e-waste collection systems (Gnanasekaran et al., 2024).

The challenges of identified infrastructure and recycling also have an impact on circular business models. While technological limitations can hinder effective recovery and processing of e-waste (Sakhuja et al., 2022), better recycling can provide opportunities to recover economically valuable from e-waste via urban mining (Mudali et al., 2021). Therefore, the e-waste management can contribute to business opportunities related to the collection, refurbishment, recycling, and resource recovery (Prasath et al., 2020). Recent Indian frameworks also underscore the importance of structured and institution-specific solutions for sustainable e-waste management, such as the National Strategy on e-Waste Management 2023 (Valai Ganesh et al., 2025) and the E-Waste Management Rules, 2021 (Shinde et al., 2023).

The results indicate that the management of e-waste needs to shift from an uncoordinated approach at individual levels to an organized approach at various stakeholders. The Sri Lankan experience also highlights that

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developing countries face regulatory, infrastructural and operational challenges in e-waste management which are all interdependent (Ranasinghe & Athapattu, 2020). Strategic actions that integrate EPR, the inclusion of stakeholders, technological innovation, formal recycling and resource recovery, then, can help reinforce the implementation of the circular economy while at the same time provide organizational and economic opportunities.

6. Conclusion

The present study shows that e-waste management in Tamil Nadu is not a problem just of environmental nature, but is an important business-management, regulatory and organizational challenge. The results suggest that there are differences between the awareness of different stakeholder groups and that occupation has a significant relationship with awareness while household awareness has no significant relationship with the disposal. Finally, companies that are more aware of their EPR show noticeably better e-waste compliance, underscoring the role of knowledge of the regulations and company commitment in fostering e-waste compliance. Theoretically, the results validate the importance of the Stakeholder Theory, Institutional Theory and principles of Circular Economy since a proper e-waste management requires regulatory pressures, awareness inside the organizations, coordination between stakeholders and circular practices. Managers should increase awareness of EPR, implement internal compliance systems, train employees, develop reverse logistics, establish recycling partnerships and promote digital traceability. These organisational efforts need to be supported by policymakers with greater enforcement, coordination with stakeholders, and formalisation of informal collectors. The limitations of the study are its geographical scope of Chennai, and the nature of the stakeholder groups surveyed, which may limit generalizations. Future studies should use larger multi-state samples, and investigate the impacts of EPR awareness, stakeholder integration, and circular-economy practices on quantifiable organizational and sustainability performance. In conclusion, it is crucial to have coordinated action by the management, regulation and stakeholders to create a more efficient and circular e-waste ecosystem in Tamil Nadu.

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