



AWARENESS OF CONSUMERS ON E-WASTE

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Abstract:

21st-century technology is advancing quickly and cheaply. It became a movement to buy novel electronic products to use the latest availability of technology. Mobiles and laptops are the most common products which are bought frequently instead of to upgrade. We sense very uncomfortable without these products. Expanding usage of the mobiles, computers/laptops, and LCD/LED in all the sectors inflicting dramatically increase in generation of e-waste. The term "e-waste" refers to all types of electrical and electronic equipment that is disposed of by the end user. So, usage of novel electronic products increased but nobody concentrates on dispatch of these. Thereby e-waste increased a lot. E-waste reusing serves a ton for the safeguarding of environment and human well beings. This paper concentrated Portable device e-waste care of individual consumer, in this review; Authorities must coordinate programs and raise public awareness about e-waste. The purpose of the study is to find out how individual consumers behave in relation to electrical waste. Awareness level of the individual consumers also checked & selected to conduct a study to check the awareness level of individual consumers. In this paper consumer awareness was analyzed with the help of questionnaire. These discoveries might contend to light the benefit of laying out an e-waste assortment framework and fortifying waste activity strategies.

Keywords: E-waste, consumers, Government legislations, Awareness, etc.

I. Introduction

Current electronic goods laptops, PCs, TVs, mobiles, etc. are our basic necessity. Today, generally every consumer has mobile phone, Television, etc. We felt very sore without these products. 21st century Technology advancing speedily and cheaply. It is popular to purchase new gadgets, electronics to use newest availability of technology. Upgrade of old product consumer desire to procure new products. India produces too a vast quantity waste of electronics i.e., electronic-waste consistently. Tragically, waste of electronics' is something that doesn't receive media attention. Subsequently, individuals' mindfulness regarding e-wastes is very low.

Global economic and technological developments are increasing demand for innovative electrical and electronic equipment. As a result, the consumption of such equipment has increased, resulting in a rapid increase in waste electrical and electronic equipment (WEEE) generation over the past five years Forti, et al [1]. Apart from the excessive consumption of electrical and electronic equipment, the short life span with limited repair options is also the reason for the high rate of e-waste generation [2]. The accessible e-waste disposal procedures India are deplorably shocking and posing problem. However, the managerial structure was setup a couple of years back to work on framework, the absence of legitimate execution stays a vital bottleneck. The ongoing examples of India's waste electronic management experience evil impacts of different hardships and detriments. The potential of environmental harm is increased since 90% above of this harmful the waste stream is managed and processed by unorganized sector. To decrease the unfriendly result of environment and safety in light of contaminating advancements and origin of improper treatment has seen of e-waste.

Indian metropolitan cities are biggest user electronic equipment's future production will include lot of electronic waste, so that our whole country may ground up in trouble. For this reason, sample survey Vizag was conducted to determine the quantity of (electronic) e-waste generated. Vizag is one of India's five pristine cities. It is also a prominent exports and imports, software hub. In Vizag

city, IT industry was rapidly growing. In this city, add up to elite educational institutions and throughout the last 20 years, there have more colleges, along with industrial growth. E-waste was increasing may which causes human wellbeing and hazardous of Environment. It concerned to show in need of attention required to curb risk to improve the situation.

1.1 E-Waste Definitions:

The term "e-waste" refers to all types of (electrical and electronic equipment) EEE that is disposed of by the end user.

E-waste refers to all electrical and electronic equipment (EEE) and its parts that have been discarded by its owner as waste without the intent of reuse [3].

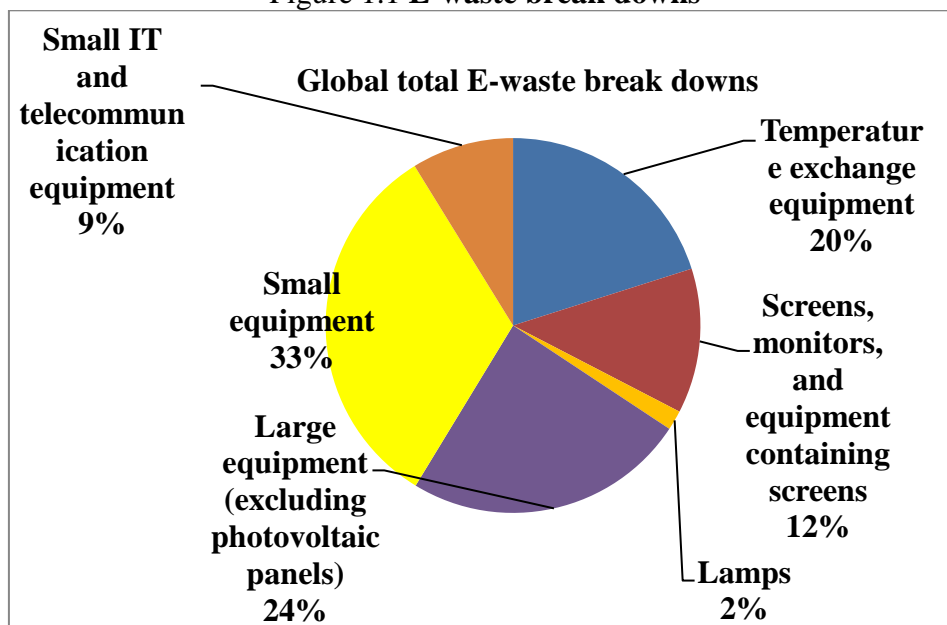
The electronic devices turned for a modification, translating, resale, recycling by recovery of an object or the delivery is "e-waste" [4].

“Electronic appliances like PCs, workstations, TVs, blue ray players, cell phones, and soon, Counting their gathering, subassembly, parts and consumables, which have been put away or undesirable by their unique clients” [5].

Table 1.1 Global total E-waste break downs

Categories	Full name	Percentage
1	Temperature exchange equipment	20.10%
2	Screens, monitors, and equipment containing screens	12.50%
3	Lamps	1.70%
4a &4b	Large equipment (excluding photovoltaic panels)	24.40%
5	Small equipment	32.50%
6	Small IT and telecommunication equipment	8.80%
	Total	100.00%

Figure 1.1 E-waste break downs



Source: Global E-waste monitor- 2019

II. Review of Literature

Islam, M. et al [6] the study found that consumers are aware of electronic waste but lack knowledge about collection points and recycling programmes like the National Television and Computer Recycling Scheme (NTCRS). Education programmes are necessary to avoid incorrect WEEE disposal. Reasons for disposal and product purchases are positively related to household income.



Forti, et al. [7] reported that in 2019, 53.6 million tonnes of e-waste were produced worldwide, with Asia generating the most (2.9 million tonnes). Only 17 of the total electrical and electronic waste was proved and reclaimed, and the fate of the remaining 82.6 percent is unknown [1]. As per the (WWEM) World Wide E-waste Monitor, 53.6 million metric tons (Mt) of WEEE were created in 2019. This figure expanded by 21% in the five years following 2014, with 74 MT of electronic waste expected by 2030.

Bhat, et al. [8] conducted a review in Pune, India, finding that buyer awareness of e-waste is high, but there is a lack of e-waste, limitations, and wasteful e-waste removal practices. It is suggested that buyers be aware of the issue and adopt a reuse, repair, and reuse strategy to manage e-waste securely while protecting health and the environment.

Jadhav S. [9] highlighted the importance of proper management of electronic waste due to its toxic and hazardous substances. He suggested adopting sustainability practices from different countries to standardise E-waste management processes.

Adediran and Abdulkarim [10] examine the e-waste problem in Nigeria, identify sources, components, and hazards, and discuss alternative approaches and recommendations for safe environmental disposal. Her NSREA intervention in Nigeria is a welcome development because everyone is involved in e-waste generation.

Borthakur A. and Singh P. [11] highlight India's challenges in managing E-waste generation and management, highlighting poor practices and potential risks to human health and the environment. Policy-level initiatives are inadequate, emphasizing the urgent need to address these issues to prevent future negative consequences.

Rode S. [12] finds that the use of electronic devices is growing rapidly due to technological innovation, low prices, and easy-to-use facilities. Mumbai City Corporation generates a lot of e-waste in the Mumbai metropolitan area, and Thane City Corporation generates a large amount of e-waste in Thane district.

Meenakshi Sundaram S. and Sinha S. [13] propose a sustainable model to bridge knowledge gaps between E-waste consumers and recycling industries. They use channels like the Electronic Dealer Network, Awareness SMS, pamphlets, and Community Collection centers to spread awareness.

2.1 Awareness of E-Waste Regulations

Sivathanu [14] study highlights the significant role of consumer awareness in e-waste management, with education and income levels significantly influencing consumer awareness.

The majority of respondents in Ghana were knowledgeable and aware of e-waste and its health risks, based on their qualification level. However, most institutions were unaware of the country's e-waste regulations, comparable to Bhat & Patil and Okoye & Odoh [15, 16]. According to Oteng-Ababio [17] people are being forced to choose between “poverty and poison” when it comes to working at recycling facilities and being exposed to health concerns.

According to a study conducted by Huang et al., [18] e-waste linked pollutants have reached Ghana's waterways through water and sediment samples. According to Akhtar, Masud, and Afroz [19], three factors—awareness, knowledge, and risk perception of e-waste management—have a favourable and substantial impact on Kuala Lumpur households' attitudes towards e-waste management. Additionally, attitudes towards managing e-waste have a significant effect on recycling behaviour.

Tarawnah & Saidan [20] revealed that approximately half of the survey sample showed awareness and knowledge about the E-waste though the majority showed acceptance for having E-waste management policy but without incurring any levy.

KAM-GTZ study [21] found that the obsolescence rate of e-waste of the lower income group i.e. SEC C of Kolkata was higher as compared to two higher income groups- SEC A & B. The two most often used strategies for e-waste disposal were sales on secondhand markets and swaps for new goods. The respondents' level of knowledge on the secure disposal of e-waste is quite poor.



2.2 Consumer Behaviour on E-waste

The desire of customers to participate in e-waste management is influenced by their behaviour. Along with attitudes and knowledge, behaviour is seen as one of the key elements that influence whether or not financing for e-waste management is increased [22].

In the eastern region hub Kolkata, according to Toxic Link (2016) [23], the word "e-waste" is rarely ever used. Over 60% of city residents say they prefer to dispose of their electronic garbage with a kawadiwala, and 84% don't know the consequences of doing so improperly. In the opinion of a sizable portion of the population in Kolkata, only the government should be held accountable and liable for the effective handling of e-waste.

In order to build management solutions and awareness-raising efforts, it is crucial to recognise how consumers care of their electronics in a given nation in order to identify relevant systemic deficiencies Perez Belis et al [24]. Without knowledge of free e-waste practices and willingness to participate, the e-waste management system will be difficult to implement as consumers mix e-waste with solid waste and do not dispose of it in an environmentally friendly manner [25].

Hanafi et al. [26] a survey conducted in Indonesia found that 77% of respondents know about e-waste, while 58% and 12% of respondents may be interested in participating in e-waste recycling.

2.3 Why e-waste is a problem?

E-waste, which is not recyclable, can release toxic metals like mercury, pb, cd, and cr (iv), as well as flame retardants like pbdes, pcbs, and ocps. These toxic metals and organic compounds have potential environmental and health effects. Electronic products, like cell phones, significantly burden important metal assets like copper, tin, cobalt, indium, antimony, silver, gold, and palladium. E-waste contaminates trash and negatively impacts wellbeing, horticulture, and the environment.

2.3.1 E-waste & its negative effects on the environment

Moletsane and venter assessed the negative effects of e-waste on human health and the environment. They found that there is no single perfect technique to dispose of e-waste, and that awareness and proper education are the most important factors affecting proper management. Improper disposal of e-waste in landfills poses a serious threat to public health and may contaminate future generations. Improper disposal of electronic devices releases toxic chemicals that affect the earth's atmosphere, soil, water, and ultimately human health [27].

2.3.2 The negative effects on air

Air pollution occurs when electronic waste is released informally through demolition, crushing or melting of materials, releasing dust particles or toxins such as dioxins into the environment. Low-value electrical waste is often incinerated, while more valuable metals are often removed using acids, leaching and other chemicals. The adverse air effects of informal e-waste recycling are most dangerous when this waste is treated, but pollution can extend thousands of kilometers from recycling sites. Air pollution from e-waste affects some group more than others, which can threaten the species and biodiversity of some areas that have not been polluted for a long time. Over time, air pollution can damage the quality of water, soil and plant species, and cause untold damage to ecosystems.

2.3.3 Negative effects on soil

E-waste can leach heavy metals and flame retardants into the ground, contaminating groundwater or plants that may be planted. This can cause diseases and prevent farmland from being productive. Large particles released during the burning, crushing or dismantling of electrical waste can also pollute the soil. The amount of contaminated soil depends on factors such as temperature, soil type, ph level and soil composition. Animals and wildlife that depend on nature for survival can also consume diseased plants and cause internal health problems [28].

2.3.4 Negative effects on water

Electronic equipments containing heavy metals such as lead, barium, mercury, and lithium are disposed improperly, leading to the leaching of these metals into groundwater channels. This can



lead to the death of plants and animals in the water, as well as lead poisoning and carcinogenicity. Local communities often depend on these bodies of water and the groundwater [27, 28].

2.3.5 Negative effects on humans

Toxic substances contained by e-waste will have an effect on human health, such as mercury (Hg), lead (Pb), cadmium (Cd), polybrominated flame retardants, barium (Ba) and lithium (Li).

TABLE-2.1 the negative effects of humans

Source of e-wastes	Constituent	Health effects
Glass panels and gaskets in computer monitors, Solder in PC boards	Lead(PB)	It Damage to central and peripheral nervous systems, blood systems and kidney damage. 2. Affects brain development of children.
Semiconductors and chip resistors	Cadmium(CD)	Toxic irreversible effects on human health. Teratogenic. Accumulates in kidney and liver and Causes neural damage.
Relays and switches, printed circuit boards	Mercury(Hg)	Chronic damage to the brain, Respiratory and skin disorders due to bioaccumulation in fishes.
Corrosion protection of untreated and galvanized steel plates, decorator or hardeners for steel housings	Hexavalent chromium(Cr) VI	Asthmatic bronchitis; DNA damage.
Computer housing & Cabling system	Plastics including PVC	After Burning, it produces dioxin Reproductive and developmental problems; Immune system damage; Interfere with regulatory hormones
Plastic housing of electronic equipment and circuit boards.	Brominated flame retardants (BFR)	Disrupts endocrine system functions
Front panel of CRT's	Barium(Ba)	Short term exposure causes: Muscle weakness; Damage to heart, liver and spleen.
Motherboard	Beryllium(Be)	Carcinogenic (lung cancer) ; Inhalation of fumes and dust. Causes unceasing beryllium disease, Skin diseases such as warts.

***Source: Kiddee, Naidu, & Wong**

2.4 Status of e-waste management Legislative in India

The E-waste (handling and management) Rules, 2018, have established the EPR model for ensuring responsible E-waste management practises in India. However, due to the novel nature of E-waste trading in India, the legal rule of EPR has remained a critical test. In India, it is believed that it is smarter to offer old and broken hardware to local sellers for a specific price rather than following EPR standards. In other countries, the behaviour has been the opposite, where the two customers and manufacturers are equal partners in this cycle regarding payment. Certain reusing expenses are charged from them, which is a duty or an expense used for the treatment of E-waste, according to the authoritative specialists. As of October 2019, national e-waste policies, laws, or regulations applied to 71% of the world's population. This is due to China and India having national legal instruments in place. However, only 78 of the 193 countries are currently covered by a policy, legislation, or regulation, representing less than half of all countries.

Table 2.2

Legislative progress on e-waste management	
Pre-1989	No Rules, legislation, policy, or regulation to address e-waste management.
1989-2003	E-waste was bought under the ambit of hazardous wastes (management and handling) rules (1989, 2000, and 2003) indirectly. Schedule- 1 of the HWM Rules covered hazardous materials in e-waste
2008	E-waste addressed a separate challenge. CPCB issued guidelines to all SPCBs in April 2008 to manage e-waste in an environmentally sound manner. It applies to all stakeholders, generators, transporters, collectors, dismantlers,
2011	E-waste (Management and Handling) Rules were introduced. It was enforced from 1 st , May 2012 It Conforms environment friendly handling, transportation, recycling, and storing
2016	E-waste (Management) Rules were introduced in 2016. Forced From 1 October 2016 The concept of Producer Responsibility Organization (PRO) introduced Buyback,
2018	E-waste (Management) Rules 2016 amended in March 2018. Compulsory from 22 March 2018. Target revision is done for the new players in
2020	E-waste (management) Rules 2016 amended in 2018. The collection target of e-waste is fixed for the year 2024. 10% increases every year up to 2024. 2021target is 50%. 2022 target is 60% and 2023 is 70%.
2021	E-waste (management) Rules2016 amended in 2018. The collection target of e-waste is fixed for the year 2024. 10% increases every year up to 2024, 2021target is 50%, 2022 target is 60% and 2023 is 70%.

III.Methodology

This is an exploratory research study to understand the consumer’s awareness of e-waste in Vizag City. The primary survey was done using a structured questionnaire with closed-ended questions using a five-point Likert scale ranging from "Extremely aware" to "Not at all aware".

3.1 Objectives of the study:

1. To identify the current electronic and electrical equipment’s usage of consumers.
2. To understand consumer E-waste awareness level and practices.
3. To find out the knowledge of consumer about the present E-waste management policies enforced in India.

3.2 Hypothesis

- H0₁: Awareness of consumers on e-waste is low
- H1₁: Awareness of consumers on e-waste is high
- H0₂: The impact of e-waste on the environment is low
- H1₂: The impact of e-waste on the environment is high
- H0₃: Awareness of laws and government legislation on e-waste is low
- H1₃: Awareness of laws and government legislation on e-waste is high

3.2 Data collection

Data from surveys is mostly quantitative primary & secondary data obtained through interviews. Closed-ended questionnaires were grouped into various sections. These are demographic,



socioeconomic, and E-waste awareness, current electronic device habits, and practises for disposing of unused electronic devices. The data were processed and analysed using descriptive and inferential statistics. The collected data was coded and entered for statistical analysis using SPSS software. First, a demographic profile of the respondents was prepared by applying frequency distribution. Later, the data obtained for the study were analysed using awareness antecedents contributing to the consumer's preference towards the proper disposal, and e-waste management in Vizag City. Factor analysis was conducted as a data reduction technique to minimise the number of variables while simultaneously maximising the amount of information in the analysis.

3.3 Sample size and sampling method

A study was conducted through a survey of consumers in Vizag. With a sample size of 200, responses were received 160, and data was collected using the convenience sampling method.

IV. Analysis

4.1 Respondents Demographic profile

Table 4.1 Demographic and socio-economic characteristics

Characteristics	Category	Frequency	Percentage
Gender	Male	100	62.5
	Female	60	37.5
	Total	160	100.0
Age	18-27 years	61	38.1
	28-37 years	65	40.6
	38-47 years	15	9.4
	48-57 years	11	6.9
	More Than 57 years	8	5.0
	Total	160	100.0
Educational Qualification	SSC	8	5.0
	Inter	6	3.8
	Graduate	30	18.8
	Postgraduate	100	62.5
	Doctorate	6	3.8
	Others	10	6.3
	Total	160	100.0
Occupation	Government	10	6.3
	Business	18	11.3
	Private	80	50.0
	Private professional	2	1.3
	Other	50	31.3
	Total	160	100.0
Marital Status	Married	90	56.3
	Unmarried	70	43.7
	Total	160	100.0

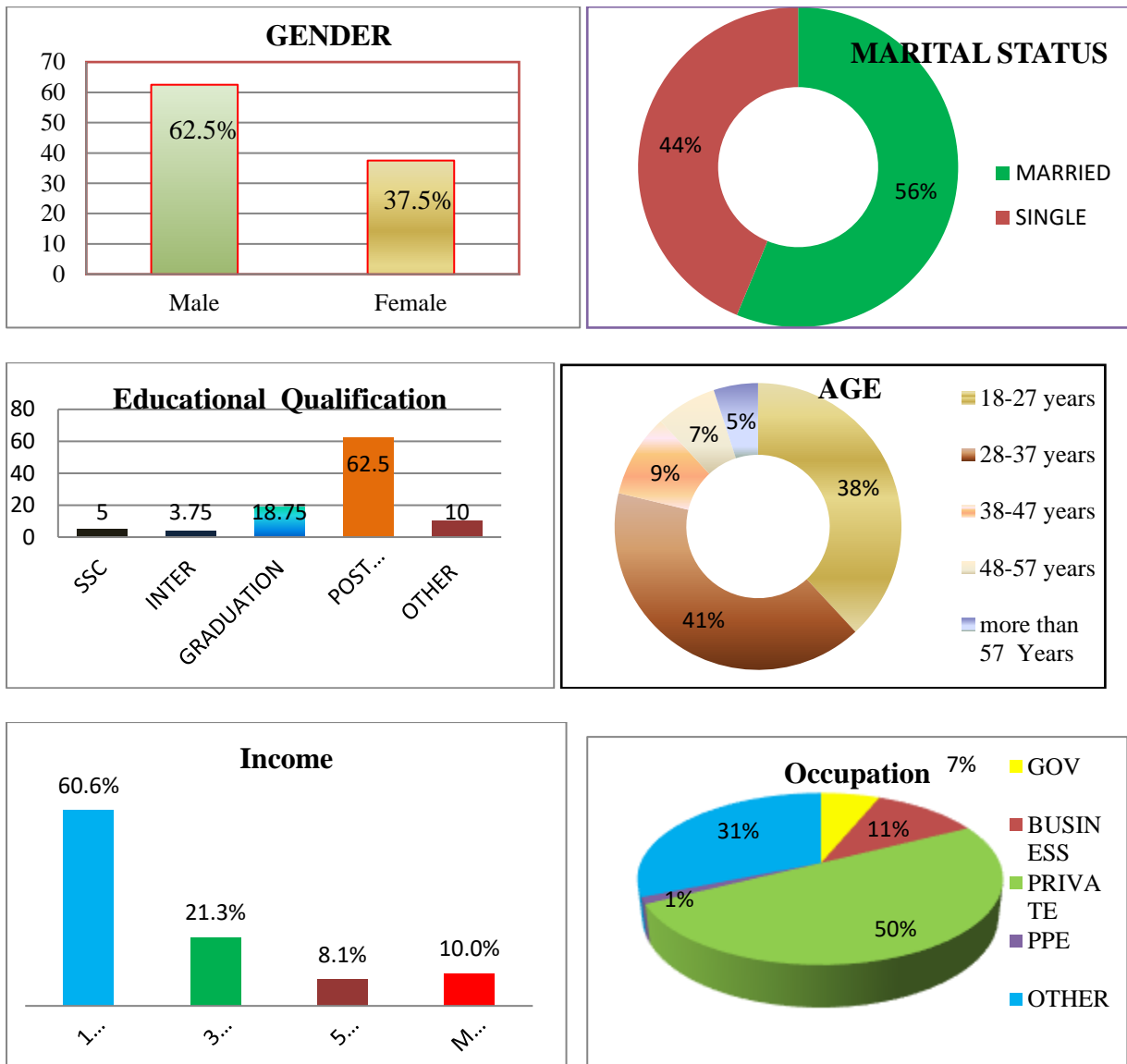


Figure-4.1 Demographic profile of respondents

Figure 4.1 interprets the demographic data of the respondents. Out of 160 respondents, 62.5% were men and 37.5% were women. Age of the consumer's highest percentage 41% of respondents were between the ages of 28 and 37, 38% were between the ages of 18 and 27, 9% were between the ages of 38 and 47, 7% were between the ages of 48 and 57, and 5% were older than 57. Most of the respondents had attained their post-graduation qualifications. 62.5% and 18.75% completed their graduation, and fewer respondents (10%) had other educational qualifications. In terms of marital status, most respondents (56%) were married, whereas 44% are individuals. In terms of income status, Out of 160 respondents, the highest percentage of respondents have 10000–30000Rs of income, which is 60.6%; 21.3% have 30001–50000Rs of income; 10% of the respondents have more than 70000Rs; and 8.1% have 50001–70000Rs of income. Whereas in terms of occupation, 50% of respondents are private employees, 31% of members have other occupations, and 11% of the respondents are government employees.

4.2 Present Electronics Usage of consumers

Table 4.2 Present usages of electronic devices

Electronic Gadgets	No of Households Using	(%)
Personal computer	98	69%
Laptop	110	75%
Mobile Phone	150	95%
Tab	40	44%
Television	152	94%
Refrigerator	130	82%
Air conditioner	90	57%
Washing Machine	95	60%

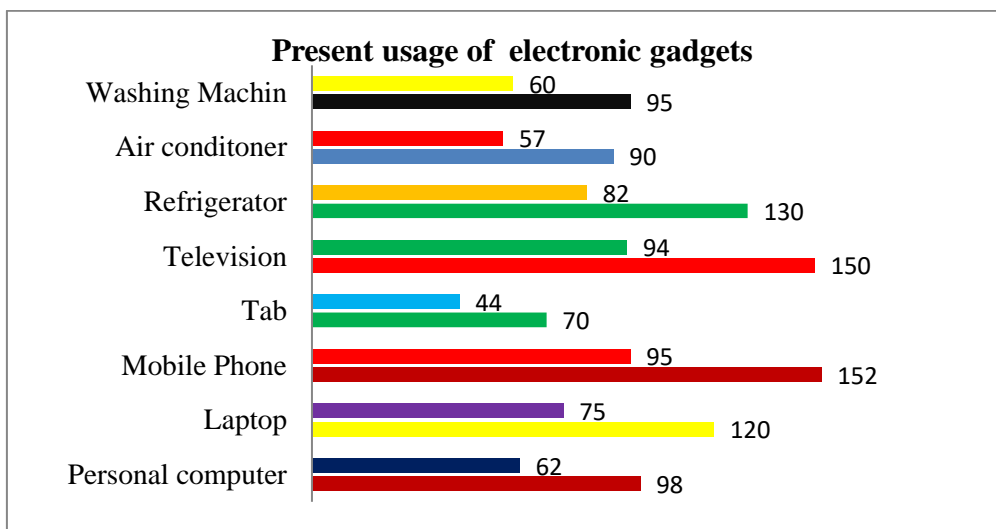


Figure -4.2 Present usages of electronic devices

Figure 4.2 interprets the data. Out of 160 household respondents, the highest 95% percentage of respondents were using mobile phones, whereas 94% of respondents were using televisions, 82% of respondents were using refrigerators, 75% of respondents were using laptops, and 44% of respondents were using tabs.

4.3 Awareness of consumers regarding e-waste

Table 4.3 what is e-waste? And source of awareness

	Responses	Frequency	Percentage
According to you what is E-waste?	Everyday household waste	29	18.1
	Industrial waste	6	3.8
	Electronic waste	112	70.0
	Don't know	13	8.1
	Total	160	100.0
What is the source of awareness for disposing of gadgets?	Internet	107	66.9%
	TV	14	9.8%
	Friends	27	16.8%
	User manuals	12	7.5%
	Total	160	100.0

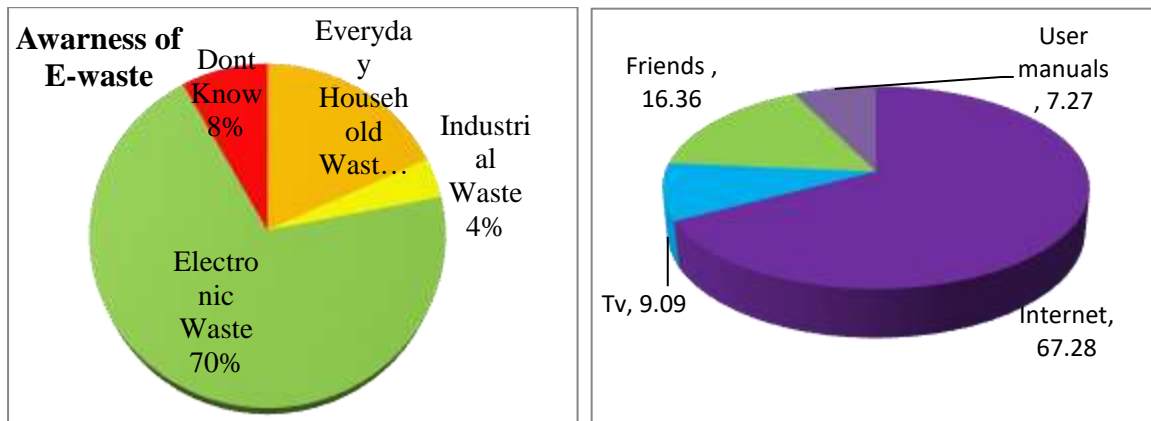


Figure-4.3 what is e-waste? And source of awareness.

Figure-4.3 Respondents were asked to respond to the questions about general awareness about what is e-waste, is. The results indicate that the respondents have prior knowledge about e-waste: 70% of respondents know about electronic waste, 18% feel e-waste is an everyday household waste, and 8% don't know about e-waste. The least number of respondents, 4%, and felt e-waste was industrial waste.

Source of respondent's prior knowledge regarding e-waste: over 71% of the consumers heard about this type of waste through the Internet, and 17% of respondent's friends and 9% of respondents from TVs are among the major sources of information about e-waste.

4.4 Options adopted disposing the gadgets

Responses	Frequency	Percentage
Stores it in home	48	30.0
Through it in dustbins along with other wastes	6	3.8
Donate to others	26	16.3
Return to the seller for exchange	37	23.1
Scrap dealers	4	2.5
Others	13	8.1
Not applicable	26	16.3
Total	160	100.0

Figure 4.4 e-waste disposal practises of consumers

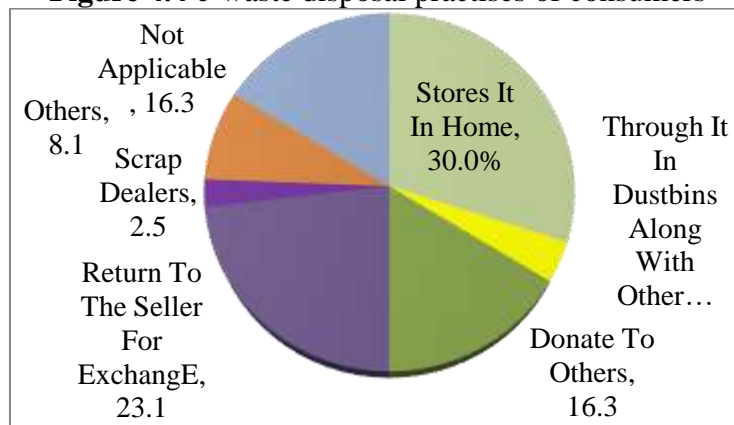


Figure 4.4 interprets the e-waste disposal practises of consumers. 30% of respondents have stored e-waste in their homes; 23% of the respondents have given it back to exchange; 16.3% of the members have donated it to friends; 8% have disposed of e-waste from other sources; and 2.5% of the respondents have given it to scrap dealers.

4.5 Awareness of government legislation and policies on E-Waste Management

Table 4.5 Awareness of Government Legislations and Policies on E-waste management

Responses		Frequency	Percentage
Do you aware on e-waste management legislations policies of the government?	Not at all Aware	59	36.9
	Slightly aware	23	14.4
	Somewhat aware	37	23.1
	Moderately aware	13	8.1
	Extremely aware	28	17.5
	Total	160	100.0
Do you aware e-waste guidelines of the state government?	Not at all aware	30	18.8
	Slightly aware	19	11.9
	Somewhat aware	27	16.9
	Moderately aware	43	26.9
	Extremely Aware	41	25.6
	Total	160	100.0

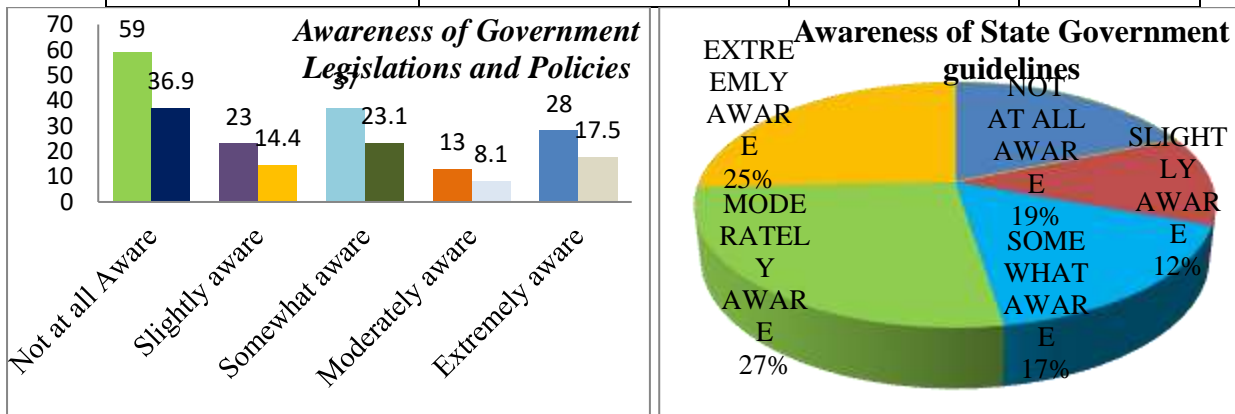


Figure 4.5 Government policies and regulations

Figure 4.5 Respondents were asked to answer questions about their general knowledge of government policies and regulations, including whether they were aware of the Indian government's policy on e-waste. 17.5% of respondents were extremely aware, 8.1% of respondents moderately aware, 23% of the respondents were moderately aware, and 36.9% of respondents were not at all aware of the Government of India's Policy of e-Waste Management.

Awareness of State Government guidelines on E-waste management

The respondents were asked to respond about their general awareness of state government e-waste management policies. 25% of respondents were extremely aware about state government guidelines, 27% were moderately aware, 17% were somewhat aware, 19% were not all aware, and 12% were slightly aware about state government guidelines.

4.6 Health & environmental risks posed by electronic wastes

Table 4.6 Health & environmental risks posed by electronic waste

Responses		Frequency	Percentage
Do you aware the health & environmental risks posed by electronic wastes?	Not at all aware	30	18.8
	Slightly aware	19	11.9
	Somewhat aware	27	16.9
	Moderately aware	43	26.9
	Extremely aware	41	25.6
	Total	160	100.0

Figure 4.6

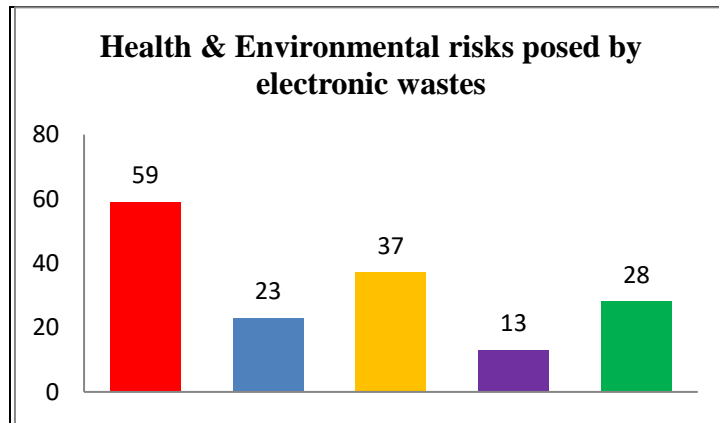


Figure 4.6 Respondents were asked to respond to the questions of general awareness about the harmful nature of e-waste: 25.6% were extremely aware, 26.9% were moderately aware, 17% are moderately aware, and 11.9% have slightly aware of the health and environmental risks posed by electronic waste, whereas 19% were not at all aware of the hazardous nature of e-waste.

V. Findings

The demographic data of respondents Male respondents account for 62.5% of the 160 total respondents. 37.5% of respondents are female. Education is one of the essential tools for raising awareness, especially in developing countries (Justice Kofi et al., 2021). According to the results, Most of the respondent consumers have completed their post-graduation, are married, and live with four family members in their houses.

Usage of electronic equipments

The use of electrical or electronic equipment by the respondents was summarised for them to select various equipments. Consumers 94% are using mobile phones. There are about eight amenities listed: television, personal computer, computer, tablet, mobile phone, washing machine, air conditioner and refrigerator. This type of resource has been grouped for options such as "At least 1", "At least 3", "At least 5" and "All". As it can be seen in Figure 3.2, a relatively high proportion of 69% of the respondents use at least five of the aforementioned pieces of equipment, while a low proportion of about 40% use all of them. A score of 0.5% for at least 1, while at least 3 got 0%.

The Source of information about e-waste summarises to show that prior knowledge and, as addressed in the research, the Internet, friends, TVs, and user manuals are the main sources of references to being aware of e-waste. Only 25% of the consumers dispose of their e-waste in a proper manner, with 16.3% donating it to friends and relatives. In addition, there was a high rate of consumers storing it at home. Majorities (34%) of the consumers are storing the e-waste in their houses only, and some of the respondents are throwing the e-waste along with household waste. 48% of consumers have no idea of the e-waste management policies presently enforced in India. Most people take into account that a lack of awareness about the hazardous effects of e-waste is the main obstacle to proper e-waste management.

VI. Suggestions

Most of the respondents are graduates and postgraduates. If awareness campaigns are provided, they may change to dispose of e-waste properly. Consumers feel that facilities are not available to discard e-waste, but if local authoritative bodies provide those resources, they are willing to dispose of them properly. People should be educated, and there should be an increase in recycling centres; otherwise, after some days due to e-waste, our future generation will suffer. Waste minimization is a key principle that must be researched, tested, and implemented in terms of sustainability. These are not only options for solving local problems but are also suitable for solving global e-waste problems.



People are replacing electronic products quickly due to higher incomes, standards of living, and professional requirements. Authorities provide collection, shipping, and handling, storage and disposal services for E-waste and set the goal of an e-waste-free city to reduce E-waste. Based on previous studies, the incentive system will promote consumers' participation, which is an important factor in e-waste management (Zeng et al). Therefore, customer behaviour regarding e-waste disposal and return-to-manufacturer systems needs to be explored.

VII .Conclusion

The analysis of the study leads to the conclusion that, based on the collected data, consumers basic awareness and practises in relation to e-waste are still inadequate. Separation of e-waste is a critical step, particularly in terms of reducing the environmental impact of improper disposal. More regulations, guidelines, and awareness programmes were conducted by the Government to manage e-waste. Operational assessment and analysis studies may be needed. However, more awareness programmes are also expected to help combat the problem caused by e-waste. These findings may highlight the need for a collection infrastructure and better management practises for e-waste. It constitutes a sizable supply of useful resources that commercially capture the recycling perspective of this waste. The survey data and the information the examination give a wide picture that overall consumer awareness is very good, but when it comes to disposal practises, they are not aware of the collection centres, the rules, or the correct disposal practises, which results in mixing it up with the solid waste and failing to dispose of it, in an environmentally friendly way. In the free e-waste system, knowing the consumers is very important to help develop reusing, repair and recycling ideas, which will contribute to the proper management of e-waste to protect the environment, health, environment and sustainability.

VIII. Scope for Further Research:

This article outlines the beginnings of awareness contributing to consumer interest in the proper disposal and management of e-waste. Future researchers can examine the relationship between the history of consumers and the management of e-waste. Demographic characteristics (such as age, income, gender, and education) play an important role in consumer awareness and preference for waste and e-waste management. Future research may test the effects of these demographic characteristics on e-waste management. This research was carried out only in the city of Vizag. It would be important to test these measures in other cities and parts of India to improve the reliability and validity of the study.

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