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An Analytical study of Selling and Buying behavior of Consumers in E-Waste trade in India with reference to Mumbai Region

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QR Code



1) Introduction and literature review:

India is a country of huge technological potential. Technology is the key driving force in banking, production, marketing, service sector, IT / ITES, business and house hold. Consumer electronics and computers, laptops, mobile sets, electronic gadgets and other house hold electronics becomes obsolete soon as electronics product life cycle is short, also switching to newer and latest gadgets and devices is a trend. This out of life product contains hazardous waste like lead, mercury, cadmium, arsenic etc which has an very bad impact on human health in particular also on the environment in general. Therefore a global concern is raised over systematic e-waste management.

Keyword: E-Waste Trade, Mumbai, MPCB, CPCB, Sustainability, Environment.

Definition: Waste generated from end of life electronic products like Microprocessor, Microcontroller, Motherboards, Printed Circuit Boards, batteries, CD, DVD, TV, LCD display units etc.

As per the authorized producers list of electronics waste as on 10/01/2018 with the central pollution control board(CPCB) only 64 producers are registered.

Figure 1: Authorized Producers of Electronic Waste registered as on 10/01/2018 with CPCB

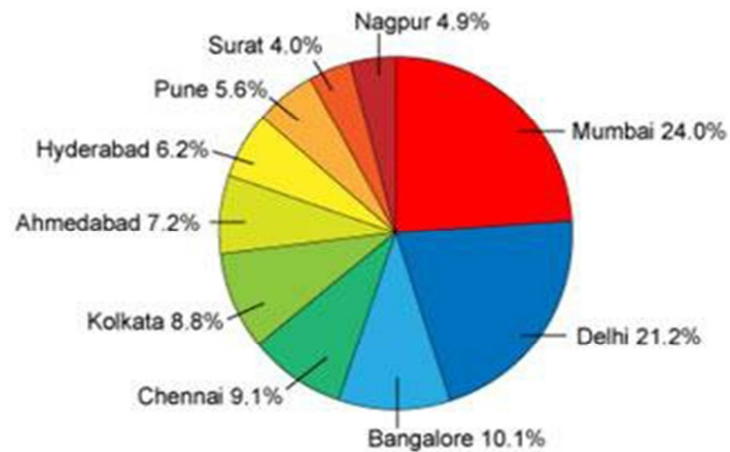
Sr. No	City	No
1	Delhi	36
2	Gurgoan	17
3	Noida	4
4	Mumbai	3
5	Chennai	1
6	Hyderabad	1
7	Goa	1
8	Gautam Buddh Nagar(UP)	1
	Total	64

Source: survey conducted

Electronic devices and largely imported from China. According to industry source 20% to 25% of the total import in India is from china during 2010 – 2015. This import percentage increased to 30% in next five year. The import from china will grow up to 40% in 2020.

Mumbai is the financial capital of India. Mumbai along with Pune is not only the largest manufacturing and import hub but also a large base of electronic consumers. This has not only given a base for IT & ITES but also gave a new business of collection, dismantle, transport and export of E-Waste. Mumbai is the largest generator or E-Waste in India.

Figure 2: City wise e-waste generation in India.



Source: Department of IT

The total e-waste generated in Mumbai shares 24% to the total e-waste generated in the country as shown in fig. 2. As per country level e-waste assessment study, Mumbai generates largest wastes among all the cities in India. Total electrical and electronic waste generation in Maharashtra is 20270.6 tonnes, out of which Navi Mumbai contributes 646.48 tonnes, Greater Mumbai 11017.06 tonnes, Pune 2584.21 tonnes and Pimpri-Chinchwad 1032.37 tonnes [3].

The increasing consumption rate of electronics and higher obsolescence rate is the major reason in generation of junk electronics and has also made solid waste management system complex in Mumbai.

2) Statement of the problem:

- I. To identify impact of unorganized E-Waste Collector/Dismantler on Environment.

II. To identify the means of regularization for unorganized E-Waste Collector/Dismantler.

3) Objective of study:

The aim is to study the impact of unorganized E-Waste Collector/Dismantler on environment & analysis for strategic and tactical planning in E-Waste management.

4) Scope of the study:

The scope of study is restricted to unorganized sector in India; also the study

5) Sample size and Methodology

The study has been conducted as a case study of the unorganized scrap collectors and suppliers. A sample of 210 unorganized scrap dealers/suppliers selected from *Do Taki, LBS & CST Road Kurla, Tilak Nagar Sakinaka, Sion Dharavi & Govandi* in Mumbai. The study focuses only on unorganized collector/assembler/dismantler in order to establish their impact trends. Also sample of 30 SME was studied to understand the generation and supply of e-waste from SME sector. The cumulative average of each parameter was also computed and correlated with different activities like safety measures during collection and dismantle hazards, Government policies, regularization rules, Environmental concern. The study used a structured questionnaire to collect the required data. Microsoft excel sheet was used

to analyze the collected data with the aid of Statistical formulas.

The data was also collected from secondary sources through the reports, research work, charts, index, journals, and annual reports from various government, non government, and private agencies.

6) Data analysis and findings of the study:

6.1 Scenario of E-Waste in Mumbai.

Waste collection and export market exists in a major way in Mumbai. This market is spread over different areas. These traders are spread in many parts of Mumbai like *Do Taki, Kurla, Saki Naka, Sion Dharavi, Govandi, Jogeshwari and some part of Malad*. This informal section in Mumbai of e-waste business collects, dismantles and transports e-waste which is ungoverned by stringent health and environmental regulations. This free trade often uses unskilled workers on daily wages without protection mask and gloves. Majority of these business areas are densely populated lower middle class localities, hence this ungoverned business sector is exposing these families and environment to dangerous toxins. Maharashtra has only 46 collectors or dismantlers authorized by the Central Pollution control Board (CPCB) and the Maharashtra Pollution Control

Board (MPCB) as shown in table 1, but more than 300 at Do Taki, more than 500 at Kurla and more than 1000 scrap dealers at Sion Dharavi,

Govandi, Jogeshvari and Malad are collecting, dismantling and transporting e-waste in Mumbai only.

Table 1: Number of registered E-Waste Collector/dismantlers in India

Authorized Collectors / dismantler of Electronic Waste Registered as on 27-11-2017 with CPCB			Authorized Collectors / dismantler of Electronic Waste Registered As on 30 th Nov 2017 with MPCB		
Sr. No	State	No	Sr. No	City	No
1	Karnataka	52	1	Mumbai	13
2	Delhi	26	2	Thane	11
3	Maharashtra	22	3	Pune	10
4	Tamil Nadu	14	4	Nagpur	5
5	Haryana	13	5	Aurangabad	4
6	UP	11	6	Buldhana	1
7	Rajasthan	9	7	Ratnagiri	1
8	Gujarat	7	Total		45
9	Uttarakhand	4			
10	MP	2			
11	Andhra Pradesh	2			
12	West Bengal	1			
13	Chhattisgarh	1			
Total		164			

Source: Survey conducted

Many times these unorganized sectors employ child-labour to manually break electronic components causing severe danger due to release of phosphorus, lead etc. This unorganized sector applies informal process to handle e-waste e.g. manual breaking of components, heating, applying acid ect. This costs them ₹ 200 - ₹ 300 per piece compared to formal process which is highly organized heating chamber at 1200^o C, shredder machines followed by electro-refining, Workers are highly skilled with proper protective environment. The investment of organized e-waste recycler or dismantler is minimum about ₹ 50 Lacks to ₹ 20 Billion (approx.).

6.2 E-Waste handling by unorganized sector in Mumbai.

To have a better understanding of all the responses received; raw data was converted into numerical results and presented them in tables and charts as illustrated below. A total of 210 shops were surveyed to collect data from shop owners, workers and transporters of e-waste in Mumbai.

As per the study conducted, it was found that the unorganized sector workers are highly unskilled and unaware about the adverse effect on their own health and environment. Out of 210 respondents 150 amounting to 71% were unaware of the legal procedures while

60 were aware but were casual due to lack of action and detection system from the authorities.

Table 2: Respondents Profile

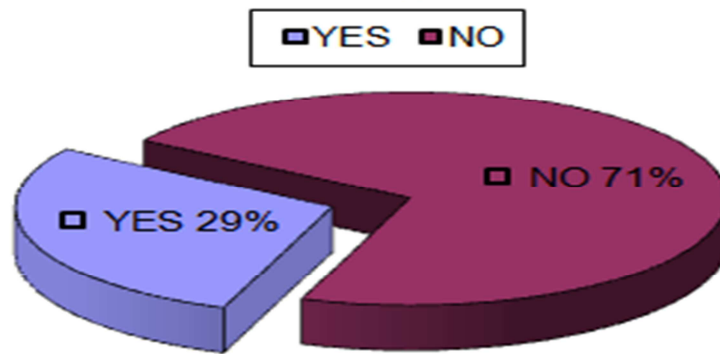
Sr. No	Respondents Type	Total Sample	240	Educational Background
1	SME	30	12.50%	Graduate - 20
				Post Graduate - 10
2	Labour	127	52.92%	Below 5 th : 87
				5 th – 7 th : 23
				8 th – 10 th :10
3	Owner / Transporter	83	34.58%	Below SSC: 47, HSC : 24 & Graduate :12

Source: Survey Conducted

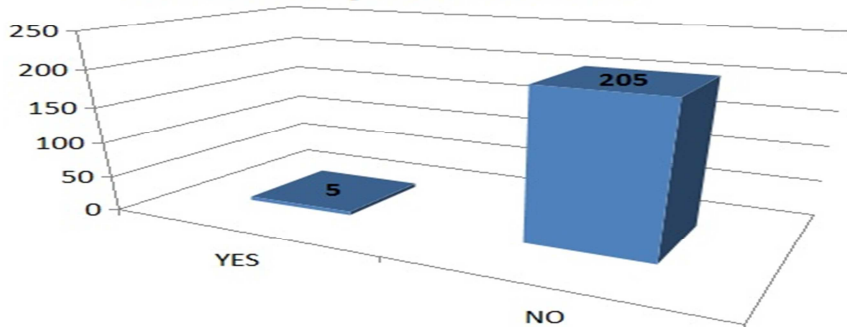
Worker in such informal sector has very low literacy rate as per the survey data 87 attended village school maximum up to 5th standard, while 57 respondents could make up to SSC (10th Standard), while 24 were HSC (12th standard) and only 12 could have attend or complete their graduation.

Figure 3: Safety measures and legalization awareness.

Awareness of Safety Rules & protective equipment in handling E-Waste



E-Waste Handled to Registered Collector/Dismantler



Source: survey conducted

As per chapter II of Environment (Protection) Act 1986, (29 of 1986) called as e-waste (Management and Handling) rules 2011 w. e. f. 1st May 2012, every collection center should obtain authorization, should sort e-waste in secure manner and ensure that no damage is caused to environment during storage and transport till it is sent to registered recycler or dismantler. Also maintain records of collection and file annual return in form – 3 to state pollution control board on or before 30th day of June following every financial year. But the study found that only 5 out of 210 workers / shop owners and surprisingly none of the SME owners are aware of the registered collector/dismantler in the state. The rule also says not to process any e-waste for recovery or refining of material without prior permission in the prescribed format from the Board.

FIGURE 4: IMPACT OF E-WASTE ON ENVIRONMENT AND HEALTH.

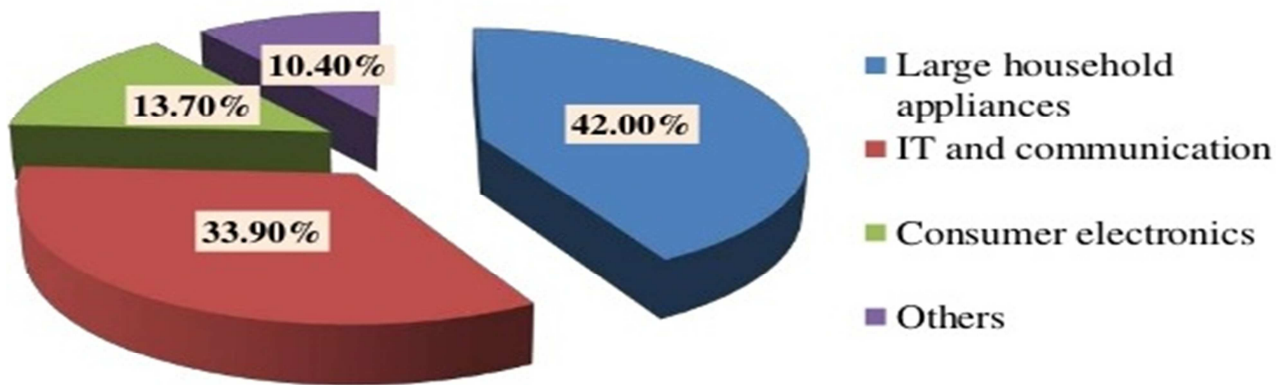
EFFECT OF E-WASTE ON ENVIRONMENT	
Element	Effect on environment
Lead	Damage to central and peripheral nervous systems, blood systems and kidney damage. Affects brain development of children
Chromium	Asthmatic bronchitis. DNA damage
Cadmium	Toxic irreversible effects on human health. Accumulates in kidney and liver. Causes neural damage. Teratogenic
Mercury	Chronic damage to the brain. Respiratory and
Plastics including PVC	Burning produces dioxin. It causes Reproductive and developmental problems; Immune system damage; Interfere with regulatory hormones

Source: e-waste effect on environment and its management

6.3 Sources of e-waste in Mumbai

According to Central Pollution Control Board the large household appliances make the major portion of e-waste in India it is up to 42%, IT and Communication devices 33.90%, followed by consumer electronics and other devices as shown in figure below.

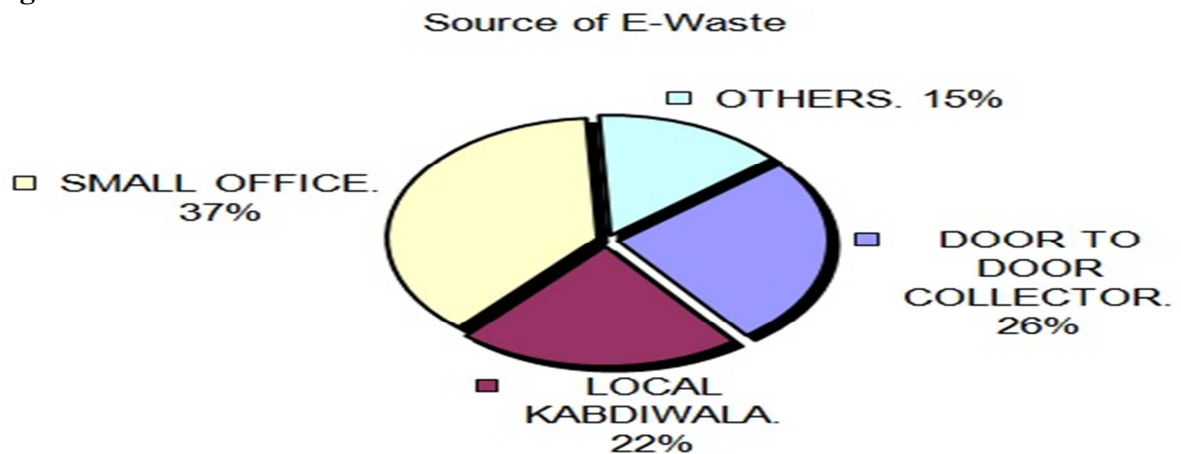
Contribution to e-waste PERCENTAGE



source: Central Pollution Control Board

The survey reveals that household electronic appliances, consumer electronics and other devices are collected door to door by small collectors some are sold to local kabadiwalas. Also small offices where Computers, LED TV, printers and other devices are in the range between 30 to 50 units' contact these scrap dealers for complete office interior dismantling in 2 to 3 years.

Figure 5: Source of E-Waste in Mumbai

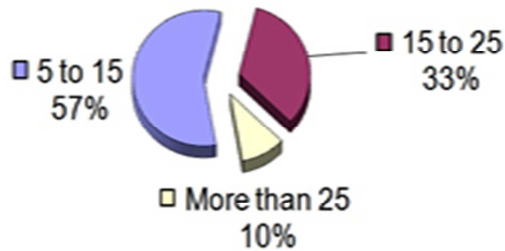


Source: Survey Conducted

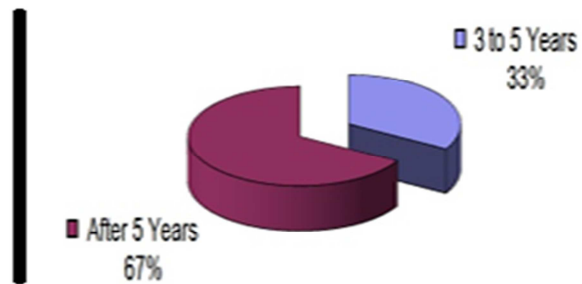
The journey of e-waste from consumer/end user to recycler is long and complex. It moves zigzag between formal and informal sector. Because of the increasing demand of automation in business processes and computerization offices makes heavy use of electronics. As reported by SME firms, a business process is focused on its business product or service, many of the SME doesn't bother about the proper disposal of e-waste. They usually try to find the easiest possible way. This leads the local collector/dealer to enter the formal way of e-waste into informal zigzag. The number of electronic devices and the replacement policy by SME is shown below in figure 6.

Figure 6: Contribution of SME in E-Waste

No of electronic devices used in SME



Replacement Policy by SME

**Source: Survey Conducted.****7) recommendations based of study:**

Chapter II, Rule 17 of the E-waste (Management and Handling) Rules, 2010, the Central Pollution Control Board (CPCB), New Delhi is termed as an authority. In addition to co-ordination with state local boards like the Maharashtra Pollution Control Board for registration and renewal of license, preparing guideline, yearly assessment of e-waste the CPCB and MPCB is also assigned the duty to conduct training and awareness programs. Therefore such informal and unorganized sector needs urgent attention. These highly sensitive areas has to take care by the Pollution Control Board regularly till every of these collectors/dismantlers and transporters understands the importance of managed and organized e-waste treatment. Also encouraging and motivating the workers involved to use safety measures and train them with new technologies.

The state pollution control board should strictly stop the unauthorized transportation of waste electronic goods in and out with the

help of local administration at Navi Mumbai, Thane, and Mumbai.

8) Conclusion:

“Prevention is better than cure”, should be the policy. Electronic waste is covered under the broad regulatory frame work of hazardous waste in India. The government is also moving to enact legislation and additional incentives for industries to comply with environmental provision and bring out market forces into environmental friendly business. Therefore the authorities have to track the material flow, the import and export quality of electronics goods, reuse policy and the most important, track the flow of e-waste from formal to informal zigzag to put a complete control on effective e-waste management in Mumbai.

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