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Satvir Kaur
Research Scholar
School of Management Studies
Punjabi University, Patiala,
Punjab, India

Mobile phones user's awareness about e-waste management and their disposal behaviour

Satvir Kaur

Abstract

Increasing population, expansion in urbanisation, growth in consumers purchasing power, rapidly advancing technology and a high rate of product obsolescence create a new type of waste known as E-waste. The mobile industry is a fastest growing industry in the world. Nowadays E-waste becomes a big problem all over the world. It has a great impact on humans beings and the environment if not recycled properly. E-waste considers all electronic goods that have no value for their owners and they discard them. India is the fifth biggest producer of e-waste in the world, discarding 1.7 million tons of electronic and electrical equipment and the volume of global e-waste is likely to rise sharply by 21% in the next three year. (UN'THINK TANK UNITED NATION UNIVERSITY 2015). So it is a time when everybody realised that e-waste can not be treated as other waste. Now the government and corporate world feel that it has their responsibility to recycle old gadgets. Govt makes a law that defines that it is mandatory to recycle and proper manage e-waste. Now organisation focus on the policy of reverse logistics that take an old product from consumers and bring back to supply chain. For proper implementation of reverse logistics policy, the study of consumer behaviour is important. The study will focus on awareness about e-waste and their disposal practices for mobiles. It will be based on primary and secondary data with sample size more than 100.

Keywords: E-waste, reverse logistics, consumer awareness, post-consumption behaviour, mobile industry

Introduction

"We live in a world of limited resources. Humanity is overshooting Earth's ecological limits, consuming resources and generating waste at an unsustainable rate. If everyone on earth lives a lifestyle of an average American, It would require five Planets more."

Global Footprint Network

Since the past decades, a large number of issues that pose a major threat to the environment and human lives have been identified. We are facing major man-made disasters like environment degradation, rising sea level, depletion of the ozone layer and global warming etc. As a result, survival of all living organism is becoming very difficult. With the start of scientific inventions, it has appeared that man has got the right to exploit the nature and its resources. But the real cause of environmental degradation is the rapid growth of industries and over-consumption of natural resources by human beings. To attain the goal of sustainable development, it is important to conserve the resources, keeps waste material under control and to preserve this material for re-use. Environmental pollution, due to the highest consumption of natural resources along with unrestricted and unregulated disposal of wastes, has reached to alarming proportions in the world. The tendency to consume is changing along with rapidly advancing technology and it is leading to a new type of waste material. One of these new types of wastes is known as electrical or electronic waste.

Electronic Waste

A boom in technological innovation has made the electronics industry to become the largest manufacturing industry in the world. With the massive development in India in this field, it has been observed that, in the past 25 years, the electronic manufacturing industries have made remarkable growth. But at the same time growth in demand coupled with the excessive use of electronic and electrical equipment has created a new but very dangerous stream of

Correspondence
Satvir Kaur
Research Scholar
School of Management Studies
Punjabi University, Patiala,
Punjab, India

waste called electronic waste. Electronic waste is popularly known as E-waste. E-waste is a term used to cover items of all types of electrical and electronic equipment (EEE) and its parts have been discarded by the owner as waste without the intention of re-use. These products can connect with the help of power plug and run on batteries which have become obsolete due to advancement in technology, change in fashion, style and status. So any products which are reached at the end of their useful life and owners are not willing to use it further considered as E-waste.

"E-waste is a generic term encompassing various forms of electrical and electronic equipment that are old, end of life electronic appliances and have ceased to be any value to their owners". (UNEP REPORT)

Electronic waste is also known as WEEE i.e. Waste electrical and electronic equipment. These are electronic devices like Computers, Monitors, TV and other display devices, telecommunication devices such as Cellular phones, Pagers, Calculators, Audio and Video devices, Printers, Scanners, fax machines, Refrigerators, Air conditioners, Washing machines and Microwave ovens etc which have been disposed off or unwanted by their original user.

A 2015 reports by UNDP estimated that 41.8 million tons of e-waste were generated in 2014, almost 25% more than 2010.

E -Waste Management-Indian Market

The electronic industries are largest and fastest growing industries in India. The rapidly advanced technology, competition among firms and up gradation of technology have forced the firms to launch new products frequently in the market and high purchasing power of consumers have encouraged them to replace their old gadgets and buy new products often. But this easy replacement may create a new type of waste, that is E-waste. It has become a serious issue because of its adverse effects on health and environment. The quantification of e-waste is very difficult in India and there is also no proper policy to check the flow of e waste and recycling of e-waste. It is also important to note that a large amount of e-waste is imported from developed countries into India. India is the fifth biggest producer of e-waste in the world, discarding 1.7 million tons of electronic and electrical equipment and the volume of global e-waste is likely to rise sharply by 21% in the next three year. (UN'THINK TANK UNITED NATION UNIVERSITY 2015)

India is expected to generate about 1.5 lakh tons of e-waste by 2020 - Manufacturers Association for Information Technology.

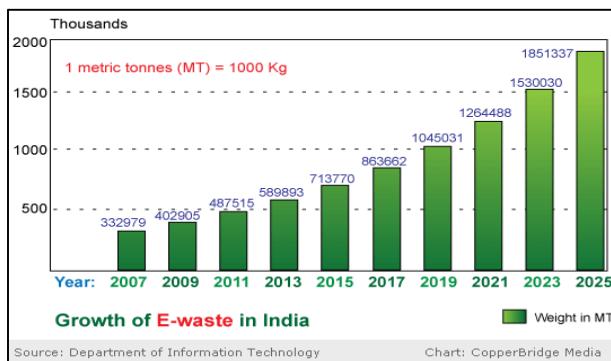


Fig 1: Growth of e-waste in India

E-Waste Management Initiative

E-waste has become a serious problem in the world. Several initiatives have been taken for the management of e-waste across the world. In India, government, as well as business firms, have also taken the initiative to control this problem. The Ministry of the environment, forest and climate are the nodal agency for making policy, planning and coordinating the environment program including electronic waste in India.

Government have formulated the law on E-waste Management. This law is known as E-waste (Management and Handling) Rule, 2011 on Extended Producer Responsibility principle. The EPR is an environment protection strategy that makes producer responsible for the entire lifecycle of the product especially to take back, recycle and disposal of products. This rule makes environmentally sound management and disposal of electronic wastes mandatory. Now, many electronic companies have started taking back scheme. Some telecommunication companies like Nokia, Acer, Motorola, Wipro, HP provide take back scheme and establish collection centers so that they can collect discarded goods. Wipro and HCL have best take back practices in India. Nokia has 354 collection centers that take back discarded products at free of cost.

Mobile Phone as Source of Waste

India is world's second largest telecommunication market and has 3rd largest smartphone market. There were 185 million smartphone connection in India as of mid 2015. In 2014, the mobile industry was contributed 6.1% of India's GDP and it will grow at a faster rate and will generating 8.2% of India's GDP by 2020. India had 453 million subscriber in India at end of 2014. Telephone subscriber has been expanded at a CAGR of 19.22 per cent to 1,002 million over fy07–15 while teledensity has been increased from 18.3 in FY2007 to 79.67 in FY 2015nbsp.

A report of the United Nations predicted that E-waste from discarded mobile phones would be about seven times higher than 2007 levels in India, and 18 times higher by 2020.

The above statistics showed that Indian Mobile Industry is growing at every sphere and ensure better communication for boosting the economic activity but at same time it will leading the gigantic challenges for waste management. The large amount of discarded mobile sets has contained toxic element which has ill effect on health and environment.

In Indian context, Mobile phone discard rate is quite high as compare to other nation and million of handsets are replaced with new sets with attractive features as the result of upgradation in technology, high income and changing life style, but this easy replacement create immense e-waste and it become serious issues.

Review of Literature

Usher P Oomman (2014) [19] did the research on *A survey of consumer behaviour towards e-waste management in the city of the Mumbai*. The Sample size was 200. The Sample consisted of persons in the age group of 18 to 50 years. The study was conducted with regards to the use of waste of computers and mobile phones. The study revealed the different factors that influenced the purchase of electronic gadgets like a necessity or new features etc. The study revealed that only mobile phones were replaced on a regular basis. The option adopted in disposing of the gadgets was

donating to other, exchanging old gadgets at retails and giving it to a scrap dealer in return for monetary gains. Only 30.5% respondents were aware of the effect of discarding gadgets while 69.5% respondents were unaware.

Mandira Sikdar and Sohini Vaniya (2014) [20] conducted the research on The new millennium and emerging concerns. The Sample size of 258 was taken. There were school students selected randomly from Gujarat. 80.23% students were aware of e-waste and harmful components of electronic gadgets. 37.6% students were in favor of discarding or disposing of old electronic gadgets and 47.29% students were not ready to discard. 67.13% knew that electronic goods were recycled. 20.93% were not sure about that electronic gadgets should be recycled.

Need For Study

The Mobile industry is the fastest and largest growing industry across the world. With growth in consumers purchasing power, rapidly advancing technology and high rate of product obsolescence, have resulted in the production of more and more electronic waste and to handle this waste has become a big Environmental challenge. It evolves one of the major concerns. India is the fifth biggest producer of e-waste in the world, discarding 1.7 million tons of electronic and electrical equipment and the volume of global e-waste is likely to rise sharply by 21% in the next three years. (UN'THINK TANK UNITED NATION UNIVERSITY 2015)

This is a time when everybody realizes that e-waste should not be treated as any other solid waste and it can be dangerous and cause harmful effects on the human health and on the environment. Govt. have formulated the policies that mandated e-waste management properly and given only to authorised recyclers. So now firms focused on extended producer responsibility policy and Manufacturing firms take this emerging problem as the significant business opportunity and focus on reverse flow also. Firms take responsibility for proper disposal of waste resulting from their manufactured products and introduce formal methods of disposal for such product. For effective implementation of reverse logistics and Recycling facility, there is intense need to create awareness and study their post-consumption behaviour.

Objective

The main purpose of this study is to know the consumers awareness level regarding E-waste and its management and their post-consumption behaviour towards Mobile Phones.

1. To assess the awareness level of the consumers regarding e-waste and its management.
2. To study post-consumption behaviour for Mobile Phone.

Scope of Study

The focus of the study is to know the level of awareness of consumers and their post consumption behaviour for mobile phone. Under this study, students of Punjabi University Patiala had been undertaken.

This study will help in formulating awareness programs for addressing this major problem more effectively. The study will help to the business firms to frame different policies to target a different segment of consumers and encourage them to return product timely to firms for recycling. It will also help in the proper establishment and implementation of firm policies like EPR, reverse logistics, recycling facilities.

Research Methodology

Study Design

This study is based on descriptive research design which describes the behavior of subjects without influencing them in any way.

Sample Design

In this study convenience sampling design is used to know level of awareness about E-waste and their post consumption behaviour towards waste of mobile phone. For convenience, Punjabi University from Patiala is selected for study. 120 students are selected from different departments of Punjabi university Patiala with age group 18 to 35 and education level from 12th to Ph.D.

Survey Instrument

This study is based on primary data and questionnaire is used to know the response from respondents. Only yes or no scale is used as measurement scale for example if we know then mark Yes otherwise No.

Data Analysis Tools and Results

In this study only percentage analysis is used for data analysis.

Total Number of Respondents = 120

Gender	Frequency	Percentage	Age	Qualification
Male	48	40	21-35	Bsc-Ph.D
Female	72	60	18-33	Bsc-Ph.D

Survey has been conducted in Punjabi University Patiala. Student of different age group with different educational background has been taken.

To assess the awareness level of the mobile user regarding E-waste and its Management.

Table 1: Mobile User's Awareness

Awareness Elements	Responses%	
	Yes	No
E waste and its Management	66	34
E-waste Management and Handling Rule,2011	29	71
Extended Producer Responsibility	46	54
Illegal imports of E-waste to India	39	61
Mobile as Major contributors in E-waste	77	23
Presence of toxic elements in Mobile e- waste	75	25
Ill effects of improper of mobiles E- waste	65	35
Recycling policy of Mobile phone	54	46
Have you given any phone for recycling	12.5	87.5
Recycling of mobile phone for Precious Metal retrieval as well as get money	10	90
Knowledge about Collection Centre of Companies	30	70

The above figure indicate that 66% respondents are aware about e-waste but 77% respondents are unaware about e-waste management and handling rules 2011. About Extended Producers Responsibility Principal only 46% are aware. Majority of respondents that are 77% are aware about e-waste generated by mobile phones and 75% aware about toxic elements in Mobile phones. About recycling policy, 54% are aware but very few respondents give their phone for recycling. About collection centre of mobile companies, very few people are aware.

To Study post-consumption behaviour for Mobile Phone

Frequency of changing Mobile phone

Bi yearly	6%
yearly	6%
Depends on the requirement	84%

Reasons to replace mobile phone

Keep up with latest technology	50%
Technology become obsolete	16%
Replaced devices due to technical failure	34%
For eco friendly reasons	0

Mobile user disposal trends

Disposal Method	Responses in %
Discard together with the other wastes for municipal waste collection	10
Storage	27
Paid to the dealers	10
Gave/Sold to friends or relatives	25
Disposed at the recycle center / station	13
Donate	2.5
On line Sale	12.5

The above table indicate that 27% people stored their old phone at home and 25% give them to their friends or relatives. Only 10% people discard with other waste and 10% give to dealers. 13% has been given to recycler centre.

Overall Findings from the Primary and Secondary Data Analysis

The following are over all finding.

- E-waste has become a serious issues nowadays.
- Several initiative have been taken by government as well private sectors.
- The Majority of respondents are aware about the e-waste and its management
- The study revealed that majority of respondents are knowing about mobile phone waste and toxic elements in its.
- The study revealed that respondents are not aware very much about recycling policy and collection centre.
- The most common reasons to buy the new phone is to update with latest technology.
- The most common disposal method for mobile phone is to store at home otherwise they give their close relatives and friends.
- There are very few respondents who give their phone for recycling.

Limitation and Recommendation for Future Research

The study has been undertaken in Punjabi University Patiala Premises. It is based on primary data but very small sample size has been taken due to shortage of time. Only students are targeted under study but for future research, different age group person with large sample size can be taken. Under this study, only mobile phone disposal behaviour has been study but for future, different electronic gadgets disposal practices can be study.

Conclusion

E-waste has become serious issues worldwide. Several initiative has been taken worldwide to curbing this problem.

It is dire need to make policies by firms for proper disposal and also make a mandatory to recycle old gadgets. It is important to aware consumers because without consumers participation, sustainable development can not be achieved. From paper analysis, it has been found that majority of consumers are aware about e-waste but they do not participate in management of e-waste.

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