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E-Waste Management and Its Business Opportunities at Tamilnadu

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Abstract

The usage of electronic devices is increasing day by day.Developed and developing countries, both are equally responsible for generating E-waste. Technology has short span of life. It has no shelf life. Change in technology takes place quite often; therefore the older one becomes redundant and turns into waste when new version of technology is emerged. This leads to generation of EWaste on a massive scale. In the technical era, every day companies are finding new electronic items and accordingly satisfy consumer needs. Consumers also express their interest in buying the electronic goods immediately after the electronic goods are introduced in the market. To examine the various ways to solve E-Waste problems. To assess the impact of E-Waste management to the local communities. The determination of sample size is a very important issue, because samples that are too large may waste time, resources and money. Descriptive analysis is an important tool used to assess the socio economic implications of E-Waste management and its business opportunities in Tamilnadu. The opinion regarding Control, Dismantling and Reuse, Refurbishment and reuse and Segregation of ferrous metal, non-ferrous metal and plastic are not equal to average level. Based on mean score, the opinion regarding all these statements of Treatment and Disposal Options are above average level. Authorized E-waste recycler must upgrade their processes and make sure they adhere to best quality standards. They must be transparent and accountable for their functioning and have to upgrade their systems.

Keywords: Human rights • Reduced Pollution • Local Communities • Socio-economic opportunities • Employment Opportunities and Contribution to National Income

Introduction

In the 21st Century, the information and communication revolution has brought remarkable changes in the way we organize our lives. The development in communication and technology in India has a great impact on our economy, industries and life style of people. Initially, we dealt with record players, radios, VCRs and black-and-white televisions; followed by CD and DVD. Air conditioners, air coolers, cellular phones, refrigerators, computers, laptops, power bank and many other gadgets arrived in the Indian market and in the hands of common man. Electronics have become part of the throw away culture of developed countries. This is not an exception even in the developing countries. Electronic gadgets are meant to make our lives comfortable, happier and simpler, but they contain poisonous toxic substances, their disposal and recycling becomes a health nightmare. These have led to various problems including the problem of huge amount of hazardous waste and other wastes generated from electric products. Over the past two decades, the global market of Electrical and Electronic Equipment (EEE) continues to grow exponentially, while the life span of those products becomes shorter and shorter. Due to Rapid economic growth, urbanization and industrialization, demand for consumer goods, has been increased for both the consumption and the production of EEE. Any improperly disposed electronics can be classified as E-waste. E-waste basically comprises electronic goods that are not fit for their original use.

Need for the Study

The usage of electronic devices is increasing day by day.Developed and developing countries, both are equally responsible for generating E-waste. Technology has short span of life. It has no shelf life. Change in technology takes place quite often; therefore the older one becomes redundant and turns into waste when new version of technology is emerged. This leads to generation of EWaste on a massive scale. The existing management practices related to E-waste in India are poorly managedand have the potential to riskboth human health as well as environment. Moreover, the policy level initiatives are not being implemented in an appropriate way. The study on this subject will definitely help in forming solid base for future research and detailed study on the subject. This material will also serve as the source of data for future study. As this is a relatively new research subject, the study conducted on this subject will help in better understanding of this subject and will also play a major role in developing the interest of concerned persons. This study will thus help in formulating appropriate measures for minimizing E-waste volume.

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Statement of the Problem

In the technical era, every day companies are finding new electronic items and accordingly satisfy consumer needs. Consumers also express their interest in buying the electronic goods immediately after the electronic goods are introduced in the market. Due to the innovation in electrical and electronic companies, consumers frequently replace their existing equipment with new one. It creates lot of impact to the society in the name of E-waste. The consequences of E-waste are shocking. The nation now dumps between 300 million to 400 million electronic items per year, and less than 20 percent of that E-waste is recycled. The extreme amount of lead in electronics alone causes damage in the central and peripheral nervous systems, the blood and the kidneys. E waste related to computers end up in landfills. Only about two percent of PCs ever find their way to a second user. About 60 million cell phones are replaced worldwide a month and only 10percent are recycled. Flat panel computer monitors and notebooks often contain small amounts of mercury in the bulbs used to light them. Cathode ray tubes in older TVs. All this toxic elements are harmful to human health and environment.

Large volume of E-waste has been sent to countries such as China, India and Kenya, due to lower environmental standards and working conditions makes processing E-waste more profitable. Just 24 States have passed or proposed take-back laws. India is not an exception to E-waste issues. Developed countries are exporting their E-waste to developing countries like India and China. In India, Maharashtra state is leading in E-waste generation and Mumbai city of Maharashtra is the leading city among all the cities of India in E-waste generation.

Scope of the Study

The prime focus of the present study is the Consequences of E-Waste

on human health and environment. It has further provided information regarding conceptual framework of E-waste. This study also revealed the impact of E-Waste on mankind and providing awareness to companies, its consequences and the suggestions of the public regarding disposal of E-waste in Tamilnadu.

Objectives of the Study

The confined objectives of the present study are:

1. To examine the various ways to solve E-Waste problems.
2. To assess the impact of E-Waste management to the local communities.
3. To offer suggestions for improving the E-Waste management and its business opportunities on the basis of findings of the study.

Research Methodology

Research methodology is a scientific and systematic way to solve research problems. The research methodology deals with research methods and taken into consideration the logic behind the methods. In total, the research methodology of the study includes research design, sampling framework, data collection, framework of analysis and limitations.

Research Design of the Study

Research design is the conceptual structure within which the research is conducted. It is a blue print for the collection, management and analysis of the data. The research design in the present study is descriptive in nature since it describes the phenomena of socio economic implications of E-Waste Management and its Business Opportunities at tamilnadu. Apart from this, the present study has its own objectives and pre-determined methodology. It is purely descriptive in nature.

Sampling Framework of the Study

The sampling framework of the study consists of determination of sample size and sampling procedure of the study.

Determination of Sample Size (For unknown population)

The determination of sample size is a very important issue, because samples that are too large may waste time, resources and money. While samples that are too small may lead to inaccurate results. According to researchers normally work to a 95 percent level of certainty. This means that if sample are selected 100 times, at least 95 of these samples would be certain to represent the characteristics of the population. The margin of errors describes the precision of the estimation of the population. For most business and management researches, a researcher estimates the population's characteristics by plus or minus 3 to 5 percent of its true values.

The researcher has applied the following formula to determine the sample size.

Sample size $n = (ZS/E)^2$

where

Z = Standardized value corresponding to a confidence level of 95% = 1.96

S = Sample SD from Pilot study of 100 samples

E = Acceptable Error =5% = 0.05

$n = (1.96^* 0.6123/0.05)^2$

Sample size = 576.10

In this study, the researcher took 576 samples from the population.

Sources of Data

The present study is completely based on the primary data. The primary data was collected personally with the help of structured questionnaire. The secondary data collected from the books, journals, magazines and websites were used to form the theoretical framework of the study and the review of literature.

Framework of Analysis

The analysis of data in a research plays a pivotal role in the sense that it interprets, justifies and proves the hypothesis and the proposals. The judicious blend of analytical tools used has its own impact on the findings of the research, thereby making it highly objective and scientific. In this context, the tools for analysis have been rightly chosen as follows.

Descriptive Analysis

Descriptive analysis is an important tool used to assess the socio economic implications of E-Waste management and its business opportunities in Tamilnadu. As it is expressed in percentage, it facilitates comparison. This analysis is carried out socio economic implications of E-Waste management and its business opportunities in Tamilnadu separately and suitable charts were also drawn for selected tables to facilitate the understanding of the reader.

T-Test

The 't' test is used to find out the significant difference among the two group of samples regarding any intention variable which is internal scale. The 't' statistics is calculated by

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{(n_1 - 1)\sigma s_1^2 + (n_2 - 1)\sigma s_2^2}{n_1 + n_2 - 2}} x \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Degree of freedom of $(n_1 + n_2 - 2)$

Whereas t – 't' statistics

X_1 – Mean of the first sample

X_2 – Mean of the second sample

σ_1^2 – Variance in the first sample

σ_2^2 – Variance in the second sample

n_1 – Number of samples in first group

n_2 – Number of samples in second group

In the study, the't' test has been used to find out the significant difference between general public gender, marital status and family type with respect to harmful E-Waste for the environment, reasons of increasing E-Waste, useful method of disposal of E-Waste, ways to solve E-Waste problems, and Impact of E-Waste Management to the Local Communities among the socio economic implications of E-Waste management and its business opportunities Tamilnadu.

To find out the significant difference between E-Waste Companies educational Qualification with respect to problems in handling the E-Waste, treatment and disposal options and Impact of E-Waste Management to the Local Communities among the socio economic implications of E-Waste management and its business opportunities in Tamilnadu.

Analysis of Variance (ANOVA)

Analysis of variance is used for examining the differences in the mean values of the dependent variable associated with the effect of the controlled independent variables, after taking into account the influence of the uncontrolled independent variables. One-way analysis of variance involves only one dependent variable or a single factor. The null hypothesis may be tested by the F statistic based on the ratio between these two estimates:

$$F = \frac{SS_x / (c - 1)}{SS_{error} / (N - c)} = \frac{MS_x}{MS_{error}}$$

$$\text{Where } SS_x = \sum_{j=1}^{c} n (\overline{Y}_j - \overline{Y})^2$$

$$\text{Where } SS_{error} = \sum_{j=1}^{c}\sum_{i=1}^{n} (\overline{Y}_j - \overline{Y})^2$$

Y_i = Individual observation

Y_j = Mean for category (j)

Y = Mean over the whole sample, or grand mean

Y_{ij} = i^{th} observation in the j^{th} category

C = Number of independent variables or groups

N = Total sample size (nxc)

The 'F' statistic follows the F distribution, with (c-1) and (N-c) degree of freedom. The ANOVA tool has been deployed to find the difference among demographic profile of respondents age, educational qualification, family size, occupation and monthly income with respect to harmful E-Waste for the environment, reasons of increasing E-Waste, useful method of disposal of E-Waste, ways to solve E-Waste problems, and Impact of E-Waste Management to the Local Communities among the socio economic implications of E-Waste management and its business opportunities in Tamilnadu.

To find the difference among age with respect to problems in handling the E-Waste, treatment and disposal options and Impact of E-Waste Management to the Local Communities among the socio economic implications of E-Waste management and its business opportunities in Tamilnadu.

Limitations of the Study

The answers given by the respondents towards measurement of socio economic implications of E-Waste management and its business opportunities may be affected by the personal value judgment.

Review of Literature

Victor SP. Kumar SS and Sanjeev S [1] explained that growth in the electronics sector and rapid changes in technology mean that more consumers are generating growing volumes of waste electrical and electronic equipment, much of which is still operational. Faced with a limited and fragmented recycling and reuse infrastructure, many consumers are storing old equipment in their homes or discarding it with their regular trash as part of municipal waste. Consumer Union has drawn from its own tests of electronics products, consumer survey data, research and analysis of existing E-waste recycling programs to assess the need for changes that will enable consumers to reduce, reuse and recycle greater volumes of this growing category of waste. Found that more workable solutions are needed at every stage of the product life cycle to protect consumers, public health and the environment.

Verma DS and Agrawal S [2] referred that developing countries are facing the problem of E-waste management enormously which is either internally generated or are imported from other countries. India is also facing the problem of E-waste management due to lack of awareness among people about dangerous effect of E-waste on environment and human being through informal E-waste collection and absence of implementation of rules for the process of E-waste in environment friendly manner. They discusses the condition of E-waste in India, the problem associated with E-waste, the method used for used for E-waste management and focuses light on the legislation work done regarding E-waste in India. They found that there is an instant need to address the issue related to E-waste in India in order to avoid its ill effect in future.

Shelton R [3] aimed of study was to improve understanding of electronic waste (E-waste) and the effect on health and the environment on a global scale, documenting the need for change, and suggesting an alternative to the present poor disposal procedures. Performing research on E-waste has provided the means to reflect on the consequences of the lack of proper recycling efforts. If a change is not made on a multi-national scale, pollution rates will increase [4]. The environment will suffer from additional amounts of chemical and hazardous material disposal. What happens to the environment will also affect the health of numerous individuals who use primitive methods to reclaim components from electronic devices and also those that live near the abundant discard piles. Nations and individuals will continue to seek the easiest and most cost effective way of dealing with E-waste. Unfortunately, that method all too often means passing the problem off to someone else. Shipping E-waste to third-world countries is seen as less trouble than creating an environmentally conscious solution. With the popularity of new, more advanced, or cheaper electronics, the problem of what to do with the unwanted devices causes the waste issue to escalate. They included the large range of data. The 29 years of recycling information assists in increasing the accuracy of the results and allows for trends in recycling being examined [5]. Weaknesses in this study include the wide variety of organizations that contributed recycling data. No single source of recycling statistics was publicly available to cover a large time span. Industry-wide electronics manufacturers and recyclers data were only available for purchase instead of readily available for public review. There were insufficient data reported from each state on a timely basis. The majority of states have no laws or policies and those that do have no ramifications for not meeting these regulations. The federal agency, the EPA, does not even provide its own data on a regular yearly basis [6].

Difference among Demographic Profile of the Respondents With Respect To Socio Economic Implications of E-Waste Management Companies

Difference among Age with respect to Problems in Handling the E-Waste

In this study,Problems in Handling the E-Waste consists of nine factors that measure Financial Problem, Legal Problems, Technical Problems, Lack of research, No scientific Process, Social Problems, No skilled workers, No awareness and No Strong Policy. Age is classified into four, Below 25, 26 to 35, 36 to 45 and Above 45. One way ANOVA is used to test the difference among Age with respect to Problems in Handling the E-Waste. The Table 1 shows the Mean, Standard Deviation and One way ANOVA results.

H_o: There is no significant difference among Age with respect to Problems in Handling the E-Waste.

Table 1. Difference among Age with respect to Problems in Handling the E-Waste.

Problems in Handling the E-Waste	Below 25		26 to 35		36 to 45		Above 45		F value	P value
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Financial Problem	4.33	.816	4.56	.527	4.75	.500	4.60	.894	.318	0.813
Legal Problems	4.00	.632	4.00	.707	4.50	.577	3.60	.548	1.463	0.255
Technical Problems	3.67	1.366	3.44	.726	4.50	.577	3.40	.548	1.514	0.242
Lack of research	3.00	1.095	3.78	.833	4.25	.500	3.40	1.140	1.648	0.210
No scientific Process	3.17	1.472	3.44	1.014	3.00	1.414	4.00	1.225	.596	0.625
Social Problems	3.50	1.517	3.56	1.014	3.00	.816	3.60	1.140	.257	0.856
No skilled workers	3.17	1.169	3.56	.882	2.75	.500	3.80	.837	1.212	0.331
No awareness	3.17	1.602	3.56	1.236	3.00	.000	3.60	.894	.323	0.809
No Strong Policy	3.50	1.049	3.56	.882	3.00	.000	4.00	.707	1.086	0.378

There is no significant difference among Agewith regard to the dimension of Financial Problem, Legal Problems, Technical Problems, Lack of research, No scientific Process, Social Problems, No skilled workers, No awareness and No Strong Policy. Since P value is greater than 0.05. Hence the null hypothesis is accepted with regard to the dimension of Financial Problem, Legal Problems, Technical Problems, Lack of research, No scientific Process, Social Problems, No skilled workers, No awareness and No Strong Policy.

Difference among Age with respect to Treatment and Disposal Options

In this study,Treatment and Disposal Options consists of nine factors that measure Control, Dismantling, Dumping in the landfills, Incineration / burning the products, Recovery valuable materials, Recycling, Refurbishment and reuse, Reuse and Segregation of ferrous metal, non-ferrous metal and plastic. Age is classified into four, Below 25, 26 to 35, 36 to 45 and Above 45. One way ANOVA is used to test the difference among Age with respect to Treatment and Disposal Options. The Table 2 shows the Mean, Standard Deviation and One way ANOVA results.

H_0: There is no significant difference among Age with respect to Treatment and Disposal Options.

There is no significant difference among Agewith regard to the dimension of Control, Dismantling, Dumping in the landfills, Incineration / burning the products, Recovery valuable materials, Recycling, Refurbishment and reuse, Reuse and Segregation of ferrous metal, non-ferrous metal and plastic. Since P value is greater than 0.05. Hence the null hypothesis is accepted with regard to the dimension of Control, Dismantling, Dumping in the landfills, Incineration / burning the products, Recovery valuable materials, Recycling, Refurbishment and reuse, Reuse and Segregation of ferrous metal, non-ferrous metal and plastic.

Difference among Age with respect to Impact of E-Waste management on Local Communities / Societies

In this study,Impact of E-Wastemanagement on Local Communities / Societiesconsists of eight factors that measure Community engagement, Protection of Indigenous rights, Protection of Human rights, Reduced Pollution, Safe and healthy living conditions, Socio-economic opportunities, Employment Opportunities and Contribution to National Income. Age is classified into four, Below 25, 26 to 35, 36 to 45 and Above 45. One way ANOVA is used to test the difference among Age with respect to Impact of E-Waste management on Local Communities / Societies. The Table 3 shows the Mean, Standard Deviation and One way ANOVA results.

H_0: There is no significant difference among Age with respect to Impact of E-Waste management on Local Communities / Societies.

There is no significant difference among Agewith regard to the dimension of Community engagement, Protection of Indigenous rights, Protection of Human rights, Reduced Pollution, Safe and healthy living conditions, Socio-economic opportunities, Employment Opportunities and Contribution to National Income. Since P value is greater than 0.05. Hence the null hypothesis is accepted with regard to the dimension of Community engagement, Protection of Indigenous rights, Protection of Human rights, Reduced Pollution, Safe and healthy living conditions, Socio-economic opportunities, Employment Opportunities and Contribution to National Income.

Test Whether Opinion Regarding Various Dimensions of E-Waste Management Companies Are Above Average Level

Problemsin Handling the E-Waste

In this study, Problems in handling the E-Waste consist of nine factors that measure Financial Problem, Legal Problems, Technical Problems, Lack of research, No scientific Process, Social Problems, No skilled workers, No awareness and No Strong Policy. The Table 4 shows the mean, Standard

Table 2. Difference among Age with respect to Treatment and Disposal Options.

Treatment and Disposal Options	Below 25		26 to 35		36 to 45		Above 45		F value	P value
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Control	3.33	1.366	3.67	.866	3.25	.500	4.40	.548	1.562	0.230
Dismantling	3.33	1.033	3.78	1.093	3.00	.816	4.60	.548	2.532	0.086
Dumping in the landfills	2.67	1.033	3.67	1.118	3.50	1.291	4.00	1.000	1.541	0.235
Incineration / burning the products	3.17	1.472	3.44	1.236	4.50	.577	3.60	1.342	.976	0.424
Recovery valuable materials	3.00	1.414	2.89	1.269	4.25	.500	3.80	1.304	1.510	0.243
Recycling	3.33	1.506	3.22	1.481	3.25	.957	4.20	.837	.681	0.574
Refurbishment and reuse	3.67	1.211	3.11	1.453	3.50	.577	4.40	.894	1.269	0.312
Reuse	3.67	.816	3.56	1.014	3.50	.577	4.20	1.304	.552	0.653
Segregation of ferrous metal, non-ferrous metal and plastic	3.17	1.169	3.67	1.323	3.75	.957	3.80	1.304	.318	0.812

Table 3. Difference among Age with respect to Impact of E-Waste management on Local Communities / Societies.

Impact of E-Waste management on Local Communities / Societies	Below 25		26 to 35		36 to 45		Above 45		F value	P value
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Community engagement	3.67	1.033	3.33	1.323	3.75	.957	4.20	.837	.656	0.588
Protection of Indigenous rights	3.67	.816	3.22	1.093	4.00	.816	3.80	.837	.808	0.504
Protection of Human rights	4.50	.548	3.33	1.225	4.25	.957	3.40	1.517	1.705	0.198
Reduced Pollution	4.50	.548	3.56	.882	3.50	1.291	3.40	1.517	1.392	0.274
Safe and healthy living conditions	4.17	1.169	3.44	1.014	4.00	.816	3.60	1.140	.672	0.579
Socio-economic opportunities	3.50	1.225	3.56	1.130	4.00	.816	4.20	1.304	.497	0.688
Employment Opportunities	3.33	1.633	3.78	1.394	4.00	.816	3.60	1.517	.207	0.890
Contribution to National Income	3.33	1.506	3.56	1.509	3.75	.500	3.00	1.414	.266	0.849

Table 4. Opinion regarding Problems in handling the E-Waste.

Problems in handling the E-waste	Mean	Std. Deviation	t value	P value
Financial Problem	4.54	.658	11.478	0.000**
Legal Problems	4.00	.659	7.430	0.000**
Technical Problems	3.67	.917	3.562	0.002**
Lack of research	3.58	.974	2.933	0.007**
No scientific Process	3.42	1.213	1.683	0.106
Social Problems	3.46	1.103	2.037	0.053
No skilled workers	3.38	.924	1.989	0.059
No awareness	3.38	1.135	1.619	0.119
No Strong Policy	3.54	.833	3.186	0.004**

Note: ** denotes significant at 1% level.

Table 5. Opinion regarding Treatment and Disposal Options.

Treatment and Disposal Options	Mean	Std. Deviation	t value	P value
Control	3.67	.963	3.391	0.003**
Dismantling	3.71	1.042	3.331	0.003**
Dumping in the landfills	3.46	1.141	1.967	0.061
Incineration / burning the products	3.58	1.248	2.290	0.032
Recovery valuable materials	3.33	1.274	1.282	0.213
Recycling	3.46	1.285	1.748	0.094
Refurbishment and reuse	3.58	1.213	2.356	0.027*
Reuse	3.71	.955	3.635	0.001**
Segregation of ferrous metal, non-ferrous metal and plastic	3.58	1.176	2.429	0.023*

Note: ** denotes significant at 1% level.
* denotes significant at 5% level.

Deviation and't' values for Problems in handling the E-Waste.

H_o: Opinion regarding Problemsin handling the E-Wasteis equal to average level.

Since P value is less than 0.01, the null hypothesis is rejected at 1% level with regard to Financial Problem, Legal Problems, Technical Problems, and Lack of research and No Strong Policy. Hence the opinion regarding Financial Problem, Legal Problems, Technical Problems, and Lack of research and No Strong Policy are not equal to average level.

Based on mean score, the opinion regarding all these statements of Problems in handling the E-waste are above average level.

Treatment and Disposal Options

In this study, Treatment and Disposal Options consist of nine factors that measure Control, Dismantling, Dumping in the landfills, Incineration / burning the products, Recovery valuable materials, Recycling, Refurbishment and reuse, Reuse and Segregation of ferrous metal, non-ferrous metal and plastic. The table 5 shows the mean, Standard Deviation and 't' values for Innovativeness.

H_o: Opinion regarding Treatment and Disposal Options are equal to average level.

Since P value is less than 0.01, the null hypothesis is rejected at 1% level with regard to Control, Dismantling and Reuse. Hence the opinion regarding Control, Dismantling and Reuse are not equal to average level.

Since P value is less than 0.05, the null hypothesis is rejected at 5% level with regard to Refurbishment and reuse and Segregation of ferrous metal, non-ferrous metal and plastic. Hence the opinion regarding Refurbishment and reuse and Segregation of ferrous metal, non-ferrous metal and plastic are not equal to average level.

Based on mean score, the opinion regarding all these statements of Treatment and Disposal Options are above average level.

Impact of E-Waste Management on Local Communities / Societies

In this study, Impact of E-Waste managementon Local Communities / Societies options consist of eight factors that measure Community engagement, Protection of Indigenous rights, Protection of Human rights, Reduced Pollution, Safe and healthy living conditions, Socio-economic opportunities, Employment Opportunities and Contribution to National Income. The table 6 shows the mean, Standard Deviation and't' values for Impact of E-Waste managementon Local Communities / Societies.

H_o: Opinion regarding Impact of E-Waste managementon Local Communities / Societiesare equal to average level.

Since P value is less than 0.01, the null hypothesis is rejected at 1% level with regard to Community engagement, Protection of Indigenous rights, Protection of Human rights, Reduced Pollution, Safe and healthy living conditions and Socio-economic opportunities. Hence the opinion regarding Community engagement, Protection of Indigenous rights, Protection of Human rights, Reduced Pollution, Safe and healthy living conditions and Socio-economic opportunities are not equal to average level.

Since P value is less than 0.05, the null hypothesis is rejected at 5% level with regard to Employment Opportunities. Hence the opinion regarding Employment Opportunities is not equal to average level.

Based on mean score, the opinion regarding all these statements of Impact of E-Waste management on Local Communities / Societies are above average level.

Findings

i. The opinion regarding Control, Dismantling, and Reuse, Refurbishment and reuse and Segregation of ferrous metal, non-ferrous metal and plastic are not equal to average level. Based on mean score, the opinion regarding all these statements of Treatment and Disposal Options are above average level.

Table 6. Opinion regarding Impact of E-Waste management on Local Communities / Societies.

Impact of E-Waste management on Local Communities / Societies	Mean	Std. Deviation	t value	P value
Community engagement	3.67	1.090	2.996	0.006**
Protection of Indigenous rights	3.58	.929	3.077	0.005**
Protection of Human rights	3.79	1.179	3.290	0.003**
Reduced Pollution	3.75	1.073	3.423	0.002**
Safe and healthy living conditions	3.75	1.032	3.560	0.002**
Socio-economic opportunities	3.75	1.113	3.301	0.003**
Employment Opportunities	3.67	1.341	2.436	0.023*
Contribution to National Income	3.42	1.316	1.551	0.135

Note: ** denotes significant at 1% level.
* denotes significant at 5% level.

ii. The opinion regarding Community engagement, Protection of Indigenous rights, Protection of Human rights, Reduced Pollution, Safe and healthy living conditions, Socio-economic opportunities and Employment Opportunities are not equal to average level. Based on mean score, the opinion regarding all these statements of Impact of E-Waste management on Local Communities / Societies are above average level.

Suggestions

1. E waste is still not a known concept for many. Efforts are to be made to create awareness programs on E- waste and its management. NGO's should start campaign aimed to protecting human health and limiting environmental effects where electronics are being produced, used and discarded.

2. All Citizens should be prompted notto indulge in rat race to acquire very new piece of technology and discarding previous equipment after a short usage period, so as to save the environment. While buying electronic products, they should opt for those that are made with fewer toxic constituents, are designed for upgrading, offer take back options and have been certified by regulatory authorities.

3. Authorized E-waste recycler must upgrade their processes and make sure they adhere to best quality standards. They must be transparent and accountable for their functioning and have to upgrade their systems.

Conclusion

E-waste or Waste Electrical and Electronic Equipment (WEEE) are loosely discarded, surplus, obsolete, broken, electrical or electronic devices. The flow of E-waste is very rapid causing threats to the human health, environment due to its toxic and hazardous attributes. E-waste is being produced by various sources in the country like Govt. sectors, commercial establishments, institutional sectors, research and developments, household and manufacturing sectors of the country. The above mentioned sectors are free to handover the waste who is going to bid more for it, that may be formal recyclers or informal recyclers or any local E-waste collectors

Scope for Further Research

The present study was confined only to the consumers and E-Waste management companies in Tamilnadu. An extended research work can be followed to study the marketing problems of e-waste management companies' employees only. There is a scope of detailed study on scientific and technical aspect of E-waste arising from electrical and electronic products. A Future study can be on functioning of all E waste management companies of India. There is a scope of a comparative study of effective E-Waste practices followed by India and other countries.

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