E-Waste Management Behaviour Of Bulk Consumers: A Study In Tamil Nadu

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ABSTRACT

Bulk Consumer means a consumer such as the Departments of Central Government like Railways, Defense, Telecom, Posts and Telegraph, the Department of State Government, the Undertakings, Boards and other agencies or companies who purchase hundred or more than hundred E & EE per annum. Being a bulk consumer of E & EE, they have to discharge certain duties and responsibilities viz., maintaining records of e-wastes generated and filing of annual returns as per the e-WM Rules to ensure e-WM in the country effectively and hence it is a felt need to conduct an empirical study on e-WM behaviour of bulk consumers and the present paper is an outcome of one such modest attempt to elicit the e-WM behaviour of bulk consumers of E & EE with special reference to Tamil Nadu.

INTRODUCTION

The electronic waste industry is booming at a very rapidly in India which is expected to increase at a rate of 20% annually. With increasing per capita income, changing life styles and revolutions in information and communication technologies, India is the second largest electronic waste generator in Asia. The major impediment in management of e-waste is about collection of such waste and unauthorized recyclers in informal sector.

Current e-waste management (e-WM) practices in India are beset with numerous weaknesses, such as the difficulty in inventorisation of generated e-waste, unhealthy conditions of informal recycling, inadequate capacities, lack of information among generators of e-waste. Only 3% of total E-

waste generated is recycled properly in India. The situation is alarming as India generates about 2 lakh tones of e-waste annually and almost all of it finds its way into the informal sector as there is no organized alternative available at present. It is true that the e-waste spectrum is broad, but IT companies are the single largest contributors to the growing mountains of it. This is because one-third of their equipments are rendered obsolete every year. Reason being is that the life cycle of some electronic goods as short as about 15-20 months.

The ICT revolution is adding a new stream of waste - e-waste - electrical and electronic equipment that has ceased to be of value to its owners. The recyclability of e-waste together with the presence of pollutants poses a waste management challenge. Indeed, most developed countries have their own systems to combat the challenges caused by e-waste the developing countries have recently recognised that it is the need of the hour.

CONCEPTUALISING e-WASTE

Electronic waste (e-waste) or Waste Electrical and Electronic Equipment (WEEE) comprises of a wide range of electronic appliances such as refrigerators, air-conditioners, stereo systems, computers, cell phones discarded by their users. However, e-waste has been defined as “any electronic and electrical equipment that has lost value to its owner” and has become obsolete for any functioning. Innovations in the technological sector take place at a very high rate and it also translates into fast technological obsolesce. This leads to an alarming rate of the production of e-waste. This gives rise to both waste management issues and also throws up business opportunity for general public. In fact, e-waste include metals to the tune of approximately 60 percent like iron, copper, aluminum, gold; and plastic material accounts for about 30 percent and the hazardous pollutants about 10 percent of the total e-waste.

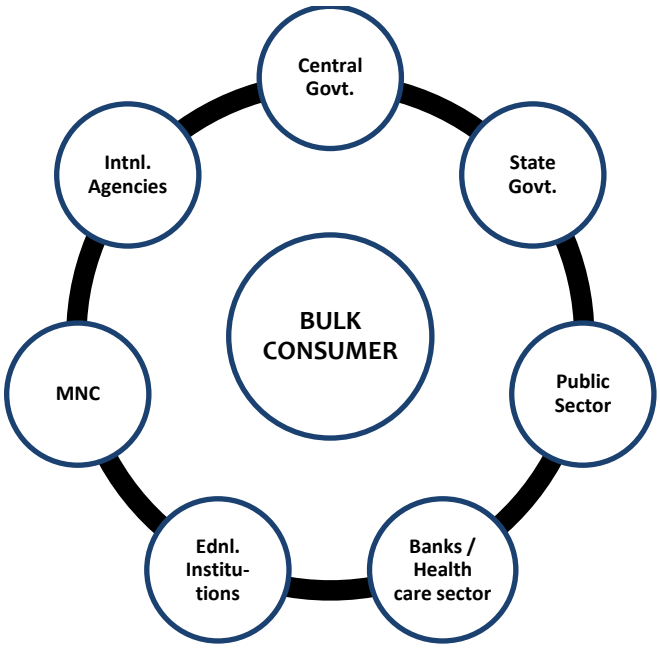
The global level estimates report that 50 million tons of e-wastes are produced annually leading to a growing tsunami of e-waste pollution. Further, electronic industry is the world’s largest innovative industry and tons of electronic items are produced annually, however, after their usage, they soon become a complex waste matter. The e-waste consists of 1000 different substances that can be categorized into hazardous and non-hazardous categories. This includes many hazardous heavy metals, acids, toxic chemicals and non-degradable plastics consequently creating serious environmental

problems. Much of it is dumped, burnt or exported to recycler which produces smoke and dust particle containing carcinogens and other hazardous chemicals leading to severe inflammations and lesions including many respiratory and skin diseases. Moreover, these electronic circuits are burnt to extract the valuable metals such as gold, platinum, cadmium. In addition, the wire coat of the electronic product consists of polyvinyl chloride (PVC) and Polychlorinated biphenyls (PCB), produces smoke, and carbon particles which are highly carcinogenic and may lead to severe lung, skin and other health diseases

BULK CONSUMER

Bulk consumers - including central and state government departments, public sector undertakings, banks, educational institutions, public and private companies - of electrical and electronic equipment as listed in Schedule-I of said e-WM 2016 Rules shall ensure that e-waste generated by them is channelised through collection centre or dealer of authorised producer or dismantler or recycler or through the designated take back service provider of the producer to authorized dismantler or recycler.The Rules further define a 'bulk consumer'[2] as the bulk users of electrical and electronic equipment as shown in Figure 1.

Figure – 1: Categories of Bulk Consumer



RESPONSIBILITIES OF BULK CONSUMERS

The Rules lay down that the consumers or bulk consumers of electrical and electronic equipment listed in Schedule I of the Rules shall ensure the following:

- that the e-waste generated is channelised through collection centre or dealer of authorised producer or dismantler or recycler or through the designated take back service provider of the producer to authorised dismantler or recycler; and
- that end-of-life electrical and electronic equipment are not admixed with e-waste containing radioactive materials as covered under the provisions of the Atomic Energy Act, 1962 (33 of 1962) and rules made there under

Apart from the above, the Rules lay down the following additional responsibilities for the bulk consumers

- to maintain records of e-waste generated in Form-2 and make such records available for scrutiny by the concerned State Pollution Control Board; and
- to file annual returns in Form-3, to the concerned State Pollution Control Board on or before the 30th day of June following the financial year to which that return relates.

The Rules have also specified that in case of the bulk consumer with multiple offices in a State, one annual return combining information from all the offices shall be filed to the concerned State Pollution Control Board on or before the 30th day of June following the financial year to which that return relates. Bulk consumers may store the e-waste for a period not exceeding 180 days and shall maintain a record of collection, sale, transfer and storage of wastes and make these records available for inspection. However, the Rules also provide that such period of storage of e-waste may be extended by the concerned State Pollution Control Board for a period up to 365 days in case the waste needs to be specifically stored for development of a process for its recycling or reuse.Therefore, it is a felt need to conduct an empirical study to evaluate the present status of e-waste management and hence the present study is one such attempt to evaluate e-waste management behaviours of bulk consumers of E & EE with special reference to Tamil Nadu.

OBJECTIVES OF THE STUDY

The present evaluative study on e-waste management among bulk consumers in Tamil Nadu was carried out with the following objectives:

- To elicit the bulk consumers' perception and attitude on e-waste management;
- To explain bulk consumers' awareness on e-waste management rules;
- To understand the e-waste handling behaviour of bulk consumers; and
- To suggest ways and means to manage e-waste to influence management policies.

METHODOLOGY

To achieve the objectives of the present study narrative research design was used. The required primary data were obtained through field survey by using a structured questionnaire from a total of 17bulk consumers who were selected randomly**.** The collected data are processed properly for discussion and interpreted by applying descriptive means of analysis. To support the discussion diagrams are also prepared and presented wherever the data necessitates. The findings achieved through data analysis are presented hereunder in summary form along with important findings.

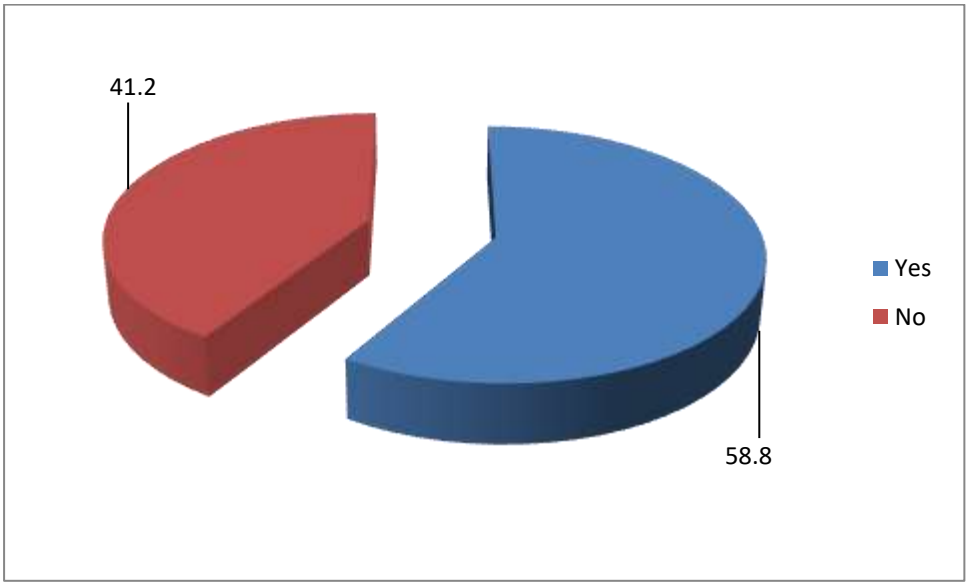
SUMMARY OF THE STUDY

For effective e-WM it is important to understand the awareness, perception and attitude of the bulk consumers too. Hence, an attempt is made through the present study to understand their awareness, perception and attitude with specific reference to international conventions, updates related to e-waste regulations, inventorization of EEE, conduct of on-site inspections, ensuring EPRA with manufacturer during procurement, practices related to filing annual returns, practice of adhering environmental protocols / addressing e-waste in work environment, receipt of information regarding the method of disposing e-waste**,** type of e-wastes generated and method of managing e-wastes, as well, e-waste disposal method and e-waste management practices adapted in the organization. are collected from a total of 17 organisations - CPCB, SPCB, State Government offices, Departments, Nationalised Banks, Educational Institutions, Multi-national Companies, Private Company and Health Care Sector thereby generalisations are achieved. The attempt to understand the bulk consumers' awareness of International Conventions andupdatede-waste regulations shows a fact that of the total

only 47.1% of them have stated that they are aware of them whereas the remaining majority (52.9%) are not.

Inventorization Exercise:It is heart worthy to note here that nearly three-fifth (58.8%) the bulk consumers have agreed that they keeping data through inventorization exercise of electronic items while the remaining 41.2% are not. However, 29.4% in the total do the practice of compiling data on e-waste, if required, during inventorization exercise (Figure 2).

Figure – 2: Practice of Keeping Data on E & EE through Inventorisation Exercise



The reason for not compiling data on e-waste during inventorization exercise is ranged from for convincing the public/people by saying that soon it will be repaired, Waiting for the end of guarantee & warranty span, Not interested to inform publicly that it is not functioning, To avoid questions from management, Waiting for optimum utilization, Expecting the availability of spare parts, to just show-off that the equipment is available with us.

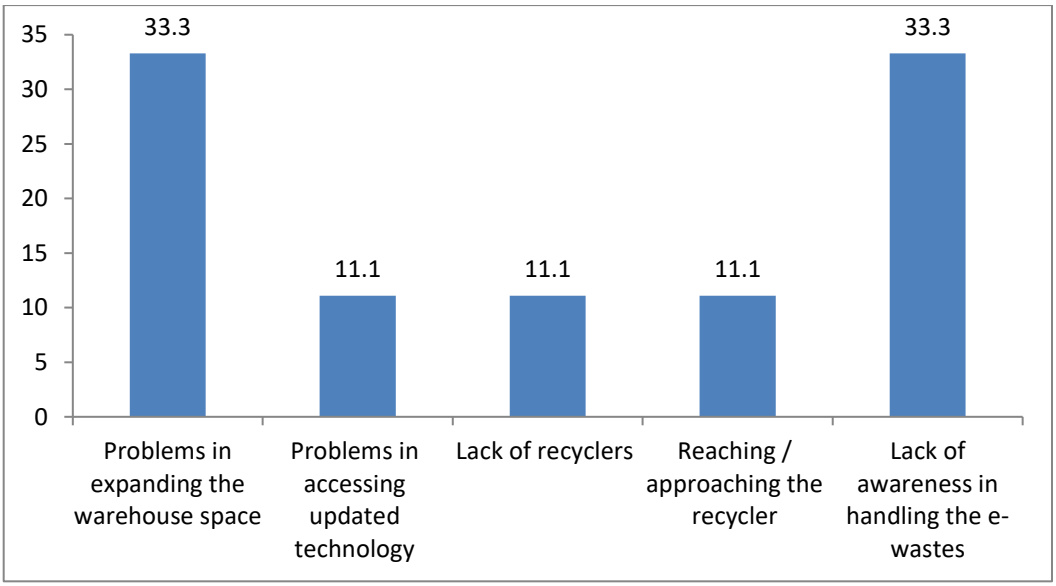
Dispose-off WEEE in an Environmentally-sound Manner: It is found that only 41.2% of the total organizations regularly encourage their Employees to Dispose-off WEEE in an Environmentally-sound Manner while another 53 per cent do it occasionally whereas never by the remaining (5.9%) in the total. Absence of facilities/infrastructure and complicated procedures were the reasons for not encouraging employees to dispose-off WEEE in an environmentally-sound manner.

Conduct onsite inspections with suppliers and recyclers for ensuring efficient environmental management systems is only by 23.4%, if they felt it and all have stated that there is no particular reason for not conducting onsite inspections with suppliers and recyclers.

Ensuring EPRA: It is to be noted that only 29.4% of the total organizations ensuring EPRA with the manufacturer during procurement whereas the large majority are not. Practice of selling to crap dealers while became obsolete, easy means of replacement, guarantee & warranty to the product is enough is the major reasons for not ensuring EPRA with the manufacturer during procurement as cited by 33.5%, 25.0%, and 8.3% of the total organisations, respectively.

Observance of Environmental Protocols: About 53 per cent of the total organizations found with the practice of adhering environmental protocols while addressing e-waste in work environment whereas the remaining 47.1% are not due to lack of awareness in handling the e-wastes, problems in expanding the warehouse space, difficulties in reaching / approaching the recyclers, problems in accessing updated technology, and lack of recyclers. It is important to note here that all the bulk consumers, irrespective of the type, have expressed their wish to avail EPRA to manage e-wastes. Figure 3 depicts the problems experienced by the bulk consumers while practicing environmental protocols in handling e-wastes.

Figure – 3: Problems Experienced in Practicing Environmental Protocols



e-Waste Disposal Means: It is noteworthy to mention here that a huge majority (88.2%) of the organizations have been informed regarding the method of disposing e-waste by either by PRIs, SPCB, CPCB, CBOs or other Government Departments. About 53 per cent of the total organizations have made arrangements - transport, toolkit, and health care facilities - to manage e-waste in the organisation while the remaining 47.1% are not. According to them management, administrative wing, human resource, and IT department is responsible for managing e-waste in the organization. To dispose e-waste 41.3% of them go for formal tender, 23.5% have made annual contract, 17.6% dispose periodically, while the means of approach is open to the rest 17.6% in the total bulk consumers. While probing the organization's method to deal with their e-waste it is found that more than three-fourth (76.5%) of them sell as scrap whereas another 17.6% sell them to recyclers and try to repair them (5.6%).

Practice of Filing Annual Returns: Of the total organizations about 47.0% of file annual returns while the majority (52.9% are not. While asked them that is there any problem in filing annual returns a huge majority (88.2%) of them have stated 'yes' and the problems in stock verification, lack of manpower/technical support, and difficulties in getting approval at different level are important amongst them. It is found that 64.7% and 58.8% of the organizations file annual returns of e-waste on time to the pollution control authorities concerned and maintain records of e-waste generated 58.8% and 70.6% of them have no interaction with E & E producers and not aware about the implications of formal and informal recycling of electronic waste. While asked the reason for their non-interaction with producers of EEE they have stated that the required EEE can be procured from the any one of the authorised bulk dealers.

Suggestions for more Economically/Environmentally Viable Solution to E-WM: Replacement of old one with the advanced one, if any by the manufactures as replacement at waived cost, Creation of core data system regarding purchase, service and end of life with item-wise procurement details, Ensuring of take back system at local level, Servicing arrangements without reminders, and Ensuring manufacturers' responsibility to take back of obsolete E & EE immediately at the end of life were suggested by bulk consumers as possible means for more

economically / environmentally viable solution to manage e-wastes.

Suggestions to further Streamline and Strengthen E-WM Practices: The bulk consumers' suggestion towards further streamline and strengthen of e-WM practices revealed asPeriodical technical support / extension of services for proper maintenance of procured E & EE, Ensuring EPR in term of take back of e-wastes, Suggesting suitable sustainable means to increase the lifespan of E & EE, and Imparting voluntarism in manufactures to replace the obsolete one with advanced one at the end of life.

FURTHER RESEARCH

It is to be noted that the present study is an attempt to elicit the bulk consumers' perception, attitude and awareness in relation to e-waste management. A comparative study can be conducted on all dimensions of e-waste management practice by having update e-WM Act/Rulesat regional level, if possible covering all the districts of the State in order to bring out the difficulties in existing e-WM practices and hence solutions can be provided to solve them. Similarly, inter-state level studies also can be planned and conducted in future. Here, the attempts were made by the researcher to test the significance of selected socio-economic and demographic variables. Therefore, a macro level study can be planned both to include and test all the possible independent variables' influence on the level of awareness, perception and attitude on e-waste management by including all the sections of the society.

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