iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** VII **Month of publication:** July 2020

DOI: http://doi.org/10.22214/ijraset.2020.7049

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue VII July 2020- Available at www.ijraset.com

E-Waste Management in India: Current Practices and Challenges

Umer Raza Hafizullah Khan Rizvee
M.Tech., G.H. Rasioni University, Amravati, India

Abstract: ***Electronic waste or e-squander alludes to undesirable, out of date or unusable advanced and electrical product. Consistently expanding use of gadgets and electrical gear all has prompted accumulating of e-squander. The cutting edge practices of e-squander control in India experiences numerous difficulties like the trouble in inventorisation, futile rules, despicable and dangerous states of easygoing reusing, awful acknowledgment of purchasers and averseness on the a piece of the partners to address the issues. India is moreover managing the difficulty of e-squander control because of absence of expertise among individuals about hazardous aftereffects of e-squander at the environmental factors and individual through easygoing e-squander assortment and nonattendance of execution of rules for the way of e-squander in environmental factors inviting way. The paper talks about the situation of e-squander in India, the issue identified with it and approach utilized for e-squander the board in India.***

Keywords: E-Waste, Environment, Toxic Hazardous, Regulations and Environmentally Sound Management.

I. INTRODUCTION

E-squander contains squander produced from utilized electronic gadgets and family unit machines which are not fit for their unique future use and are proposed for recuperation, reusing or removal. Such squanders envelops wide scope of electrical and electronic gadgets, for example, PCs, hand held phones, individual sound systems, including enormous family machines, for example, fridges, climate control systems and so on. E-squander contain more than 1000 distinct substances a significant number of which are poisonous and conceivably dangerous to condition and human wellbeing.

The most recent decade has seen an enormous development in the assembling and utilization of electronic and electrical gear everywhere throughout the world. As an outcome of this, joined with fast item out of date quality, and lower costs, disposed of electronic and electrical hardware or 'E-squander' is currently the most quickly developing waste issue on the planet. Most organizations today structure their items for arranged or saw out of date quality. This is fortified through showcasing and retailing practices, and reasonableness and accommodation have taken over from item solidness as essential drivers (Jennifer, 2005). E-squander is a rising issue just as a business chance of expanding essentialness, given the volumes of E-squander being created and the substance of both harmful and significant materials in them. The part including iron, copper, aluminum, gold and different metals in E-squander is over 60%, while poisons involve 2.70% (Widmer et al., 2005). In this manner, reusing of E-squander is a significant subject from the purpose of waste treatment as well as from the recuperation part of important materials. Anyway the procedure of reclaim and removal of E-squander is extremely intricate, which includes different sorts of items, numerous individuals and endeavors, broad zones, and long time range (now and then is much more than ten years), it is a tremendous and entangled framework. Electronic waste particularly PC squander is developing exponentially in volume due to expanding request of data innovation and its application in the national development process. Different government division, open just as private segments are quick taking care of old gadgets apparatuses, for example, PCs, phones, and so forth., into the waste stream.

A. Sources of e waste in India

E-squander is being delivered by different sources in the nation like Govt. parts, business foundations, institutional areas, exploration and advancements, family unit and assembling divisions of the nation.

Singular family and private venture the extent that PCs radiating from singular families are concerned; it is hard to know the specific amount. Singular family units are not significant supporters in India. They represent 22% of absolute PCs in India. The remainder of offer, that is 78%, originates from the business area. Enormous business, establishments, government house and remote international safe havens were the soonest clients of electronic items; today they represent 78 percent of all out introduced PCs. Consequently, they are the significant makers of outdated innovation in India. It is seen that the complete number of old PCs exuding from business just as from singular family units will be around 1.38 million.

©IJRASET: All Rights are Reserved

PC producers and retailers are following up of supporters of the e-squander fragment in India. The waste structure this area involves imperfect IC chips, motherboards, cathode beam tubes and other fringe things created during the creation procedure. It additionally incorporates damaged PCs under assurance obtained from buyer as substitution things. It is assessed that around 1050 tons for each time of waste originates from this division.

E squander from imports has been greatest wellsprings of PC scrap are imports. Gigantic amounts of e-waste, for example, screens, printers, consoles, CPU's, projectors, cell phones, PVC wires, and so forth are imported. The PCs subsequently imported are all things considered, models and measures, and useful just as garbage materials.

Optional market squander incorporates TV, PCs, mobiles, electric sheets and so forth.

B. Research Methodology

This paper follows an exploratory strategy dependent on a subjective audit of the ecological and social angles in the zone of e-squander area. An exploratory technique was received due to non-accessibility of adequate data on e-squander. Information gathered through exhaustive investigation of subjective information identified with the theme that have been distributed in different Government and NGOs' reports, research papers, news stories, sites and so on.

C. Waste Management in India

India is the fifth biggest producer of e-waste in the world; discarding 1.7 million tonnes (Mt) of electronic and electrical equipment in 2014 (Economic Times, 2015). In India e-waste collection, transportation, segregation, dismantling, recycling and disposal is done manually by untrained labors in informal sector. Due to low awareness and sensitization, e-waste is terrified along with garbage which is collected and segregated by rag pickers. E-waste contains reusable and precious material. Rag pickers sell this e-waste to scrap dealers and run their livelihood.

The scrap dealers supply the e-waste to recycling industries. The recyclers use old and hazardous technologies and equipment, to recycle/treat the e-waste (Gupta & Kumar, 2014). India produces nearly 12.5 lakh MTs of e-waste every year, (ASSOCHAM, 2014). India ranks 155 out of 178 nations in environmental performance index. It also ranks poorly in various indicators like 127 in health hazards, 174 in air quality, 124 in water and sanitization (EPI, 2014). environmentally sound management (ESM) of e-waste will also improve ranking of India in these areas.

India is being used as dumping ground of e-waste by many developed nations.

Looking at the country-wise share in India’s e-waste imports, US has a maximum share of around 42%, China at around 30% followed by Europe at around 18% and rest 10% is from other countries like Taiwan, South Korea, Japan etc.

top ten states and cities producing e-waste in India.

The 70% e-waste produced in the country is being produced by ten states only and 60% by 65 cities (Rajya Sabha, 2011). The growth rate of discarded electronic waste is high in India since it has emerged as an Information Technology giant and due to modernization of using electronic products for last 60 years; however, there is no proper disposal system followed in our country that has led to an enormous amount of e-waste.

As there is no separate collection of e-waste, no reliable figures are available as yet to quantify the e-waste generation. In India, most of the operations related to e- waste such collections, segregation, dismantling, recycling, and disposals are performed manually.

In the absence of the adequate technologies and equipment, most of the techniques used for the recycling/treatments of e-waste are very raw and dangerous.

D. Waste collection Estimation of e waste in India

As per the report of UNEP, by 2020, the e-squander from old PC would develop by up to 500% from 2007 levels in India while South Africa and China will observer a 200-400% ascent in PC related waste. The e-squander from disposed of telephone in India will develop by multiple times from 2007 levels, though in China it is evaluated to see a seven time ascend in electronic waste from cell phones.

An evaluation directed by the Manufacturers Association of Information Technology (MAIT) Indian equipment exchange association express that India delivers just about 4, 00,000 tons of e-squander every year. Out of the nation's absolute e-squander just 5 percent is reused and around 40 percent of old and unused PCs and electronic items rot in homes and distribution centers. Due to quicker pace of fresher model of electronic entering in the market, the e-squander is developing in Indian market at a disturbing rate.

©IJRASET: All Rights are Reserved

E. Challenges of E-squander Concern.

1) Low level of mindfulness among makers and shoppers of the perils of wrong e-squander removal.
2) No exact evaluations of the amount of e-squander produced and reused accessible in India.
3) Major segment of e-squander is handled by the casual (sloppy) area utilizing simple procedures, for example, corrosive filtering and outdoors consuming, which brings about serious ecological harm.
4) E-squander laborers have practically no information on poisons in e-squander and are presented to wellbeing dangers.
5) High-chance terrace reusing activities sway helpless social gatherings like ladies, youngsters and migrant workers.
6) Inefficient reusing forms bring about significant misfortunes of material worth and assets.
7) Cherry-picking by recyclers who recoup valuable metals (gold, platinum, silver, copper, and so on) and inappropriately discard the rest, presenting natural risks.
8) No explicit enactment for managing e-squander the executives.

F. Guidelines for Environmentally Sound Management of E-Waste, according to E-Waste Management Rules, 2016.

E-squander (Management and Handling) Rules, 2011 was informed in 2011 and had come into power since first May, 2012. These guidelines are material to each maker, purchaser or mass customer, assortment focus, dismantler and recycler of e-squander engaged with the assembling, deal, buy and preparing of electrical and electronic gear or parts determined in plan – I of these Rules. Two classifications of end of the existence electrical and electronic gear specifically

1) IT and media transmission gear and
2) Consumer electricals and hardware, for example, TVs, clothes washers, fridges forced air systems and fluorescent and other mercury containing lights are secured under these standards. The fundamental element, of these standards, is broadened maker duty (EPR). So as to guarantee successful execution of EPR by makers and to build their job, in powerful administration of e-squander, GoI has informed the e-squander (Management) Rules, 2016 vide G.S.R. 338(E) dated 23.03.2016 which will be successful from 01-10-2016. Target based methodology for execution of EPR has been received in the e-squander (Management) Rules, 2016. Stage savvy assortment target has been fixed for makers for the assortment of e-squander, which can be either in number or weight and will be 30% of the amount of waste age as showed in EPR plan during initial multiyear of usage of rules followed by 40% during third and fourth years, half during fifth and 6th years and 70% during seventh year onwards. Under the e-squander (Management) rules, 2016 CPCB has been ordered to plan rules on broadened maker duty, ecologically solid destroying and reusing, assortment focuses, capacity, repair, channelization, transportation and arbitrary examining for RoHS (Reduction of Hazardous Substances) testing. In this archive all the above rules have been incorporated aside from rules on restoring and irregular testing for RoHS (Reduction of Hazardous Substances) boundaries. This report, appropriateness of rules, definitions, duty of makers, assortment focus, dismantler and recyclers are given in annexures.

G. Guidelines for Extended Producer Responsibility

1) Extended maker duty (EPR) is the obligation of any maker of electrical and electronic hardware (EEE) for assortment and channelisation of e-squander from end of life item to an approved dismantler/recycler.
2) A maker can execute its EPR either through reclaim framework as well as by setting up assortment focuses or both for channelisation of e-squander from end of life items to approved dismantlers/recyclers.
3) The makers are required to have game plans with approved dismantlers/recyclers either separately or by and large or through a maker duty association spelt out by the maker in its EPR plan which is appropriately affirmed by Central Pollution Control Board (CPCB) in maker's EPR authorisation.
4) EPR authorisation is compulsory and must be acquired by all the makers including shippers, e-retailers/on line venders/e-straight and so on in regard of EEE as recorded in plan – I of e-squander (Management) rules, 2016.
5) Selling or setting of EEE in the market by any maker without EPR authorisation will be considered as making harm nature. Activity as conceived under condition protuction Act, 1986 will be taken against the makers who work without EPR authorisation.

H. Guidelines for Collection and Storage of E-Waste.

1) After evaluating their assortment prerequisite of e-squander makers may gadget an assortment component which may incorporate reclaim through vendors, assortment focuses or legitimately through approved dismantlers/recyclers.
2) For assortment of e-squander maker may take help of any expert office like maker duty association (PRO).

©IJRASET: All Rights are Reserved

3) Producer may deal with a framework legitimately or with an assistance of any expert office like PRO for his sake for assortment of e-squander by including applicable partners, for example, buyer, mass shopper, casual segment, inhabitant affiliations, retailers and vendors, and so on.
4) Producer may likewise have a course of action of assortment of e-squander from individual and mass customers too.
5) The maker may expose their assortment framework which may incorporate subtleties of their assortment focuses, canisters and assortment vans connected to assortment focuses or reclaim framework, store discount conspire, e-squander trade, retailers/vendors and PRO and so forth for making assortment framework powerful and functional.
6) If reclaim framework is being given then it ought to be available to any resident found anyplace in the nation.
7) The reclaim framework so gave might be through their retailers/vendors or through help places and may have assortment focuses or canisters or drop-off focuses connected to their approved assortment communities.

I. Guidelines for Collection Center of E-Waste

Assortment focus may gather and store e-squander, for the benefit of maker/dismantler/recycler/revamps, and sent such waste to approved dismantlers/recyclers/distinguished by the maker if there should be an occurrence of assortment for makers.

1) Only those assortment habitats may work which are a piece of EPR-authorization of the makers or set up by dismantlers/recyclers/refurbishes.
2) Collection focuses working for the benefit of numerous makers then all such makers give this data in their EPR application.
3) Collection focuses needs to gather e-squander either in the interest of maker or dismantler or recycler or refurbisher including those emerging from stranded items. Assortment focuses built up by makers/PRO can likewise gather e-squander in the interest of dismantler, renovates and recycler including those emerging from stranded items.
4) The assortment focuses/containers can be assigned spots where e-waste can be gathered through local locations, office buildings, business edifices, retail outlets, client care stores, instructive and research establishments, inhabitant government assistance affiliations (RWAs). These assortment focuses must be a piece of maker's assortment places or PRO's assortment communities or makers reclaim framework, dismantlers/recyclers/restores assortment focuses.
5) Mobile assortment vans can be utilized for entryway to entryway assortment of e-squander or from foundations/people/little endeavors and such vans will be connected to assortment focuses and whenever gave by makers will be a piece of their EPR plan.

J. Guidelines for Earth Sound Destroying of e-squander.

1) Any individual or association or enrolled society or an assigned organization or an organization or an affiliation can take part in destroying of e-squander into their segments by getting authorisation from the separate SPCBs/PCCs. Dismantlers may set up their assortment community subtleties of which will be entered in their authorisation. These assortment places will not require separate authorisation.
2) A dismantler can be a piece of makers/PRO reclaim/channelisation framework.

Destroying activity is basically manual activity for isolating different segments/parts and sending them to separate clients/recyclers. Straightforwardly usable segments can be sent to be utilized as extra. Different parts can be sent to recyclers/approved recyclers relying on the idea of the part. For instance, steel or aluminum part which contains no perilous constituents can be sent to particular recyclers. Different parts which may contain perilous constituents must be sent to approved recyclers.

K. Guidelines for Ecologically Stable Reusing of E-squander

As per these principles any individual who is occupied with reusing, reprocessing and recuperation of waste electrical and electronic gear or congregations or their segment is a recycler. Recyclers may set up their assortment communities, subtleties of which will be entered in their auth

II. CONCLUSION

It is reality that the e-squander age is expanding quick because of out of date quality of the electrical and electronic hardware (EEE). Individuals either store the out of date hardware in their home or offer it to the nearby authorities for financial advantages. By and by there is no administrative restricting system for e-squander the executives. Taking into account that there is no e-squander assortment system at places. E-squander assortment, transportation, isolation, destroying, reusing and removal is done physically by undeveloped works in casual segment because of low mindfulness and affectability. So as to connect the computerized separate, there is exponential development in the utilization of electrical and electronic gear (EEE) thus there is a disturbing impact on nature

©IJRASET: All Rights are Reserved

and human wellbeing when the ICT squanders are not discarded deductively. The authoritative work with respect to e-burn through had been doing recently in time and isn't performing great. Along these lines the attention to individuals about e-squander should be expanded and the guidelines ought to be appropriately executed to control the ascent in e-squander in future. There is a developing need to have an appropriate data framework through normalized components and existing strategies, rules in accordance with the global gauges and practices for a solid e-squander the board framework.

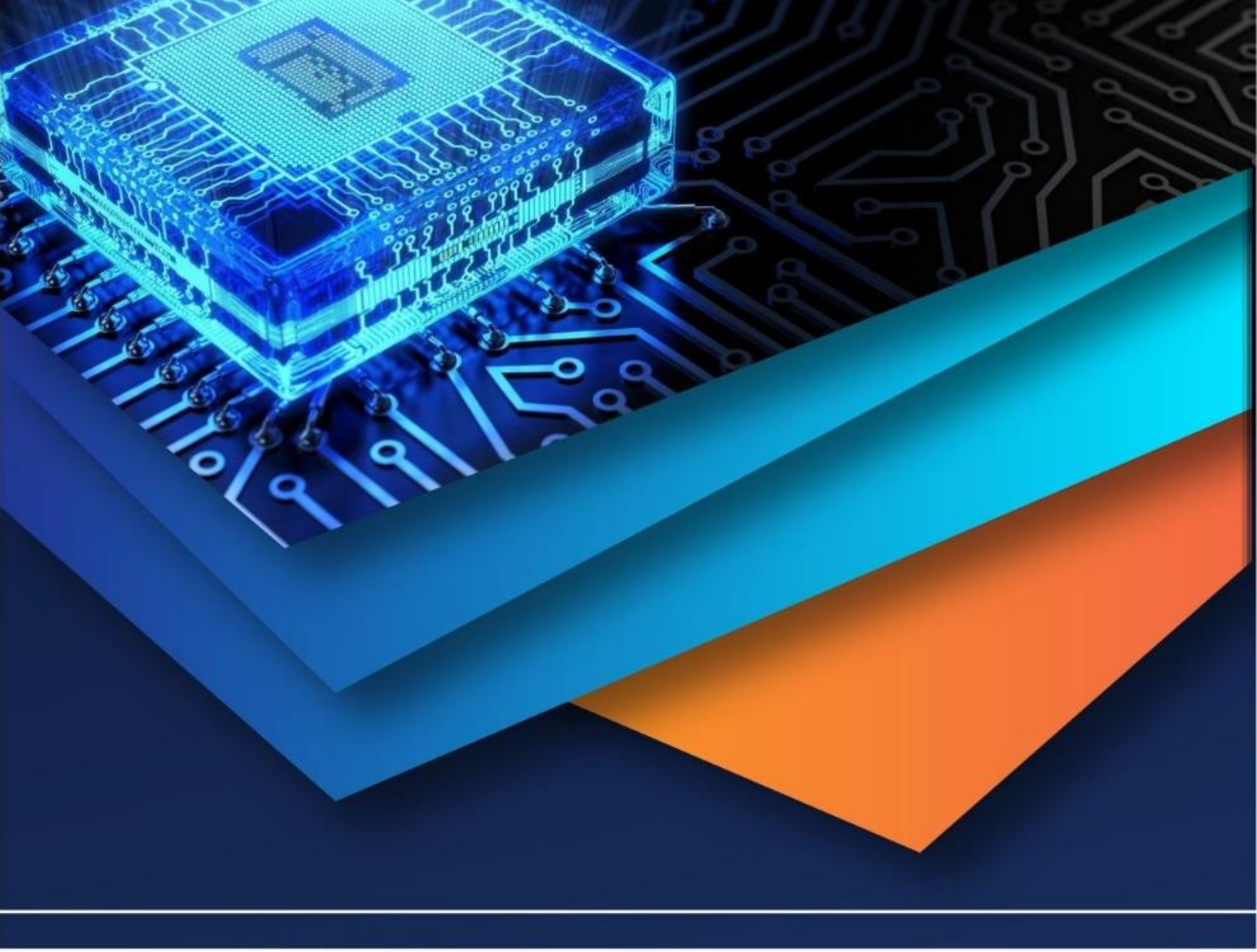
III. ACKNOWLEDGMENT

I would wish to pay special thankfulness, warmth, and appreciation to the persons below who made my research successful and assisted me at every point to cherish my goal: My Supervisor, Mr. Dahake, head of a department, G.H. Raisoni University, Amravati for his vital support and assistance. His encouragement made it possible to realize the goal. My Assistant professor, Bharti Changhode whose help and sympathetic attitude at every point during my research helped me to figure in time. Professor Dahake whose reminders and constant motivation encouraged me to satisfy the deadlines. All the University, staff members and lab technicians of the department of chemistry, whose services turned my research a hit.

REFERENCES

[1] Anwesha Borthakur, Pardeep Singh, “Electronic waste in India: Problem and Policies”, International Journal of Environment Science, Volume 3, 2012, pp 354-362.
[2] ASSOCHAM.(2014, April 21). Retrieved September 21, 2014, from www.assocham.org: http://www.assocham.org/newsdetail.
[3] Deepali Sinha-Khetriwal, P. K. (2005). A comparision of electronic waste recycling in Switzerland and in India. Environment Impact Assessment Review 25 , 492-504.
[4] Environmental Performance Index. (2014). Retrieved from epi.yale.edu:
[5] G. Gaidajis, K. Angelakoglou and D. Aktsoglou, “E-waste Environmental Problem and Current Management”, Journal of Engineering Science and Technology, Review 3(1), 2010, pp 193-199.
[6] Guidelines for environmentally sound management of E-Waste (As per E-Waste Management Rules, 2016) Central Pollution Control Board, Delhi.
[7] Jennifer, C. (2005). Distancing the waste: Overconsumption in a global economy.
[8] Retrieved september 30, 2014, from htt://www.learningace.com.
[9] Joseph, K. (2007). Electronic Waste Management In India :Issues and Strategies. Eleventh International Waste Management and Landfill Symposium. Italy: CISA, Environmental Sanitary Engineering Centre, Italy.
[10] Kumar Rajesh, (2016). Current Scenario of e-waste management in India:issues and strategies. International Journal of Scientific and Research Publications, Volume 6, Issue 1, January 2016 430 ISSN 2250-3153.
[11] Lundgren, K. (2012). The global impact of e-waste:addressing the challenge. Geneva: International Labour Organization.
[12] Report on “E-waste in India”, Research Unit (LARRDIS), Rajya Sabha Scretariat, New Delhi, June 2011, rejyasabha.nic.in
[13] UNFCCC. (2013, September 18). Validatio Report- Greenhouse Gas emissions reduction by recovering metals and materials through Electronic Waste collection and recycling process performed at Attero Recycling Pvt Ltd plant located in Roorkee, Uttarakhand, India. Retrieved 1 15, 2015.
[14] Widmer R.,Heidi O.K.,Deepali S.M. Heimz B. _Global perspective on e-waste‘. Environ. Impact Assess. 25, 436, 2005.

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)