Report E-waste management: generation; collection and recycling

Submitted to the Hon'ble High Court in W.P. (C) 8917/2015

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On March 14, 2018 the Hon'ble High Court had directed Sunita Narain, DG, Centre for Science and Environment to submit a report on e-waste management. This report is in compliance with the order of the Hon'ble Court. It reviews the current status of e-waste in the country and based on this, recommends urgent actions that need to be taken and directions for the consideration of the Hon'ble High Court.

1.Do we have an estimation of how much e-waste is generated?

India does not have an updated inventory of e-waste generation, which makes it difficult to say how much waste is recycled and how much is disposed off and how. The Central Pollution Control Board (CPCB) had done the last comprehensive inventory in 2005 – over a decade ago and in that report future projections of e-waste generation were provided. It is these projections that are currently being used in the country.

This 2005 report had projected that by 2010, the country would generate some 0.8 million tonnes of e-waste. By 2018, this projection could well be way off the mark, given the explosive growth of the electronic sector in the country. In its submissions to the Rajya Sabha the Union Ministry of Environment, Forests and Climate Change (MoEF&CC) has accepted that there is no 'comprehensive inventorisation of e-waste generation in India'[1].

However, a few independent studies do suggest that the generation of e-waste could be much higher. The *Global E-Waste Monitor, 2017* published by the United Nations University says that India generates about 2 million metric tonnes of e-waste (2016) annually and is ranked 5th in the world among top e-waste producing countries — USA, China, Japan and Germany. The gravity of the problem can be understood by the fact that this report says, "The large increase (in total e-waste generation of the world) was mainly attributed to India." Computer equipment account for almost 70 per cent of e-waste, followed by telecommunication equipment – phones (12 per cent), electrical equipment (8 per cent) and medical equipment (7 per cent) with remaining 4 per cent coming from household e-waste.

This increase quantity of e-waste is because of increased consumption but also obsolesce. People are discarding old computers, mobiles and other equipment

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[1] Rajya Sabha reply, March 23, 2017

much faster than before. According to a May 2017 study[2] the volume of waste is growing at an estimated 21 per cent annually. This report predicts that by 2020, e-waste from old computers in India will increase by 500%; from discarded mobile phones will be about 18 times higher; from televisions will be 1.5 to 2 times higher; from discarded refrigerators will double or triple; than their respective 2007 levels. So, the problem of e-waste is clearly much bigger than what is estimated by government today.

2. **Are we importing e-waste?**

What adds to e-waste challenge is just not the fact that India generates massive domestic e-waste for which it has no inventory; but also that it may just be importing vast quantities of e-waste – both legally and illegally.

Officially, Indian government says it has banned the import of e-waste for disposal into the country as per Hazardous and Other Wastes (Management and Trans boundary) Rules, 2016. But there are many ways the same rule can be flouted – both legally and illegally.

What is prohibited for import is not clear
Schedule VI lists the hazardous and other wastes prohibited for import.
Under this Schedule (A 1180) includes:
"Waste electrical and electronic assemblies or scrap (does not include scrap assemblies from electric power generation) containing components such as accumulators and other batteries included in Part A of Schedule III, mercury-switches, glass from cathode-ray tubes or other activated glass and PCB capacitors or contaminated with Schedule II constituents (e.g. cadmium, mercury, lead, PCB) to an extent that they exhibit hazardous characteristics indicated in Part C of Schedule III."

Part C of Schedule III has a list of hazardous characteristics – substances that are explosive, to poisonous or toxic. But it is not clear how the definition will be used in practice.

In other words, there is sufficient ambiguity in the definition of how contaminated or hazardous will be measured. This is particularly important as the country lacks both testing and monitoring facilities to ascertain the nature of toxicity of the product.

On the other hand, import is allowed but "regulated"

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[2] Pankaj Pathak, Rajiv Ranjan Srivastava and Ojasvi 2017, Assessment of legislation and practices for sustainable management of waste electric and electronic equipment in India, published in Renewable and Sustainable Energy Reviews 78 (2017) 220-243

The Schedule III (Part A and Part B) includes list of hazardous waste, which can be imported but with prior informed consent. In other words, it is regulated and requires permission from MoEF&CC.

Under Part B (B1110) it lists the following:
Electrical and electronic assemblies <u>other than those listed in Part D</u>
Electronic assemblies consisting of metals or alloys
Waste electrical and electronic assemblies or scrap <u>not </u>containing components such as accumulators and other batteries included in Part A of Schedule III, mercury-switches, glass from cathode-ray tubes or other activated glass and PCB capacitors or contaminated with Schedule II constituents (e.g. cadmium, mercury, lead, PCB) or <u>from which these have been removed, to an extent that they do not possess characteristics contained in Part C of Schedule III</u>."

Therefore, technically e-waste is not banned for import. It is regulated. Under this provision, parties requiring permission to import have to apply to MoEF&CC.

MoEF&CC gives permission and records this in minutes of the meeting. However, there is no compilation or database available to track what has been permitted import and where has it been used or disposed off.

This is important as the Rules allow the import of hazardous waste and other waste from any country only for recycling, recovery, reuse and utilization including co-processing. Therefore, it is critical that there information on such regulated imports is compiled and recycling can be regulated as well.

Import is permitted legally if material is "used" and will be "re-exported"
But what is even more worrying is that the Rules explicitly allow for import and export of certain waste <u>without any permission</u> from the MoEF&CC (see table). This provision is technically meant for used goods that will be imported for refurbishment and re-export. But because of lack of data and monitoring it could well be used to dump large quantities of e-waste into India.

Table: What is 'permitted' to be imported without prior permission in e-waste (Part D of Schedule III of Hazardous and Other Waste Rules (B1110)

B1110	Electrical and electronic assemblies (including printed circuit boards, electronic components and wires) destined for direct reuse and not for recycling or final disposal
	- Used electrical and electronic assemblies imported for repair and to be re-exported back after repair within one year of import
	- Used electrical and electronic assemblies imported for rental purpose and re-exported back within one year of import
	- Used electrical and electronic assemblies exported for repair and to be re-import after repair

	- Used electrical and electronic assemblies imported for testing, research and development, project work purposes and to be re-exported back within a period of three years from the date of import
	- Spares imported for warranty replacements provided equal number of defective or non functional parts are exported back within one year of the import
	- Used electrical and electronic assemblies imported by Ministry of Defence, Department of Space and Department of Atomic Entergy
	- Used electrical and electronic assemblies (not in bulk; quantity less than or equal to three) imported by the individuals for their personal uses
	- Used Laptops, Personal Computers, Mobile, Tablet upto 01 number each imported by organisations in a year
	- Used electrical and electronic assemblies owned by individuals and imported on transfer of residence
	- Used multi functional print and copying machines (MFDs)
	- Used electrical and electronic assemblies imported by Airlines for aircraft maintenance and remaining either on board or under the custodianship of the respective airlines warehouse located on the airside of the custom bonded areas.

Under this provision, parties <u>do not require prior permission for import</u>. However, the import of these goods requires custom authorities to verify documents specified in Schedule VIII. Under this, customs has to check if there is an undertaking for export; and the copy of the annual return filed with SPCB for import in the last financial year.

But again, there is no database available about what has customs cleared for import. It is also clear that SPCB's have no information about what they have permitted. Therefore, the current Rules, without adequate monitoring and enforcement allow sufficient avenues for import of e-waste.

It is also clear that customs authorities lack manpower and infrastructure to distinguish between second-hand used product say, a computer and e-waste. The UNU's Global E-Waste Monitor Report refers to these as lacunae in global e-waste trade. "Countries measure import and exports flows with international trade statistics, which are usually based on trade from customs. Such statistics use the global Harmonized Trade System (HS) codes. However, the HS codes do not distinguish between new and used electronics." Clearly, this loophole needs to be plugged so that countries do not get e-waste in the name of 'used' goods for refurbishment.

There is also the curious case of multifunction print and copying machines
What is even more curious is the case of "used" multi-function machines (MFDs) –the common printers and fax-copying machines. The Rules say that the policy for free trade for multi-function print and copying machine will be reviewed once MFDs are domestically manufactured. But this policy has not been revised

and as a result, "used" machines are in all possibility flooding the country, without any restrictions.

Imports of e-waste are therefore, not banned. At best, they are regulated – but there is no database on these goods. E-waste could be well imported as 'used' goods, for re-export within a year. But there is no database on what is being imported as "used". There is also the question of how regulations and most importantly agencies will differentiate between "waste" and "used" goods. There is also no mechanism to check if the 'used' goods have been re-exported or not.

The 2016 Hazardous and Other Waste Rules provide that the importer of goods (Under Part B of Schedule III – which allows regulated imports) will need to obtain extended producer responsibility-authorization as producer under the E-Waste (management and handling) Rules 2011. But the database on this authorization is also not available. Therefore, for all practical purposes, e-waste could be imported without restrictions into the country.

International reports on India's imports of e-waste

According to 2015 UNEP report titled '*Waste Crime--Waste Risks: Gaps in meeting the global waste challenges*', the destinations for large-scale shipments of hazardous wastes, such as electrical and electronic equipment, include Africa and Asia. It says that based on preliminary research on e-waste trafficking by UNEP in 2013, the EU, US, Japan, and Korea were the main origins of e-waste shipments. China, India, Malaysia, Pakistan, and a few other countries were the main destinations".

Clearly, therefore, we need much better systems to check dumping of e-waste into India. This is particularly important as we currently have no way of monitoring that this waste is indeed safely recycled and re-processed and does not add to the toxicity challenge we already face.

The solution clearly lies in identifying data and enforcement gaps as well as in tightening the Rules for regulated and legal e-waste imports. Otherwise, it is clear that large quantities of e-waste can be imported. This will only add to the quantities of e-waste that are being domestically generated and the compound the crisis of management of hazardous waste.

3. What is the e-waste management system in the country?

In 2016, the Central Government notified the E-waste (Management) Rules, which now supersede the E-waste (Management and Handling) Rules, 2011. The 2016 Rules came into force from October 1, 2016.

A key highlight of the 2016 Rules is the concept of Extended Producer Responsibility (EPR). Under this, producers of electrical and electronic

equipment have register and then have mandatory targets to collect e-waste that they generate and to ensure that it channelized to authorized recyclers.

The life cycle of their product – how many years it takes before it is replaced or discarded – decides the quantities that will be taken back. So, under EPR the company must take back a certain proportion of their sales of that particular year – therefore, a smart phone producing company has to take back a proportion of the phones it sold 5 years ago – the age of a smartphone has estimated at 5 years. The list of all products is provided. It ranges from 5 years for a smart phone or mini-computer to 12 years for a fax machine.

The target is set by the Rules. In March 2018, the Rules were amended and the target was reduced to 10 per cent for 2016-17 (as against 20 per cent). This year's target (2017-18) remains 20%. This target progressively goes up to 70 per cent in the seventh year. In EU, the targets range from 55-80%.

Under the Rules the penalty for non-compliance is stringent – companies would not be allowed to sell their products if they are found to be non-compliant with the set targets.

The onus has been set on the companies for meeting the collection target. They can adopt schemes like Deposit Refund – where consumers can leave a deposit, which is re-funded at the time of return. This is not mandatory, however. Therefore, most companies are not doing this.

As per the Rules, the manufacturer must provide addresses, e-mail address, toll-free telephone numbers to inform consumers where they can return their e-waste. This, again, is hardly being practiced.

Therefore, the Rules provide for collection by the company – this year's target is 20% of the end of the life sales (as estimated). Under the EPR registration given by CPCB, the quantity of e-waste that must be collected under different categories is listed.

The problem is implementation and enforcement.

The CPCB website has a list of 264 companies, which have been registered under EPR. The collection targets for four years have been given in the individual letters to companies. However, it is not clear if these companies have indeed met the targets – even the now diluted target of 10 per cent for 2016-17.

For 2017-18, CPCB says that it is collecting information from the state boards and will soon compile it.

There is no information how CPCB will verify if the target was indeed met and most importantly, what did the company do once the e-waste was collected.

4. **What happens to e-waste even if collected by companies?**

This is the nub of the issue. Will it is recycled? More importantly how and who will do the recycling and in what environmental conditions?

According to the EPR registration, each company has a target and also has a listed authorized recycler to whom the waste will be sent.

All companies engaged in manufacture, collection, refurbishment or and recycling have to get authorization from SPCB/CPCB and then file annual returns in a prescribed format.

All companies doing refurbishment or recycling are required to follow CPCB guidelines for pollution control.

However, there is no independent mechanism to check or verify the claims made in authorizations. The E-Waste Rules provide for random checks. But it is not clear if these are being conducted and what is being found.

Also it is not clear if the number of registrations under EPR – 264 – will cover all the companies engaged in this business.

So, no matter how robust the E-Waste Rules are on paper, implementation is a clear problem. It is no wonder that the UNU's Global E-Waste Monitor Report states, "The large increase (in generation of e-waste across the world) was mainly attributed to India, where legislation was adopted."

5. **Recycling happens but in the informal sector**

The fact is recycling of e-waste does happen – but in the informal sector and under abjectly poor conditions of labour and environmental safeguards. This is how the costs are kept low. This is also why countries like India are the preferred destination for large quantities of such waste – our poor provide the labour needed to dismantle and then to reuse the materials. These 'recyclers' work in hazardous conditions with dangerous exposure to toxins.

Studies estimate that 95% of e-waste is recycled in the informal sector and in rather crude manner which is not only very harmful for the environment but potentially dangerous for the people employed in the sector. It includes manual dismantling, separation and shredding, unsafe removal and collection of solder using heating, acidic extraction of metals, burning of waste to remove combustible plastics and isolate metals. Such activities cause severe pollution in air, water and soil and affect worker's health. The few studies that have been

conducted in these recycling hubs – like Moradabad in UP or Mandoli industrial area of Delhi-NCR – show concentration of toxic heavy metals in the soil and water.

The government admits that there is huge pollution because of toxic constituents but in its reply to Parliament on December 29, 2017, MoEF&CC has said that it has not conducted any formal study regarding the health hazards due to E-waste.

The question is what can be done to improve the working conditions of the informal sector? The E-Waste Rules provide that the department of labour in the State or any other government agency authorized in this regard by the State needs to ensure recognition and registration of workers involved in dismantling and recycling. It also needs to undertake annual monitoring to ensure safety and health of workers. But this is clearly not happening.

In fact, there is a big possibility that the more waste we import or collect will end up outsourced to the poorest and the most unorganized for reprocessing. The costs of pollution have to be discounted if we want to keep our competitive advantage in this 'recycling' business. The poor in India will continue to bear the brunt of our excessive use of electronic materials and our waste.

The question is if policy can utilize the strength of the informal but ensure that it does not allow the environmental and health costs to be discounted. This would require companies (ERP companies) to provide plans for improving working conditions of the informal sector and to pay for this to happen. This vertical integration with the informal sector is perhaps the only way that we can improve the working conditions and yet provide recycling at cost-effective rates. But again, this requires monitoring and enforcement.

6. So how much e-waste is 'formally' recycled?

The only information available is for the 'organized' and 'authorized' recycling.

In its reply to a question in Rajya Sabha, MoEF&CC has stated that there are 178 recycling/dismantling units in the country with a capacity of 0.44 million metric tonnes – Maharashtra has the largest number of such authorized centres.

According to the last available data from CPCB, 17 states recycled 0.099 million metric tonnes of e-waste in 2015-16 and 2016-17 through 214 authorized recyclers.

However, Delhi has not reported any authorized recycling in this list supplied by CPCB.

Therefore, 'authorized' recycling is miniscule. If the total quantum of e-waste is taken to be 2 million metric tonnes per year then we are recycling as little as 4 per cent.

If we add the legal or illegally 'imported' e-waste to the 2 million metric tonnes of domestic e-waste that is possibly generated, then the amount formally recycled will go down even further.

7. **Recommendations for the consideration of the Hon'ble High Court**

Clearly, as given above, the situation of e-waste management requires much improvement. There is no data on the current generation of e-waste. Then miniscule amount of the massive quantities of e-waste that is generated is recycled in authorized centres. The 2016 Hazardous Waste and E-Waste Rules provide for provisions to ensure collection and authorized recycling. However, the implementation of these rules needs significant improvement.

It is also not clear if we are allowing import of e-waste – as regulated waste and as 'used' material for refurbishment and re-export. Clearly, this would only add to the challenge of safe recycling and reprocessing. The role of the informal sector in the recycling business needs to be re-positioned so that it can provide cost-effective opportunities but without discounting environmental safety and labour conditions.

In all this, it is difficult to assess if the 2016 Rules have led to any improvement in this situation on the ground. There is no data on the authorized recycling done of e-waste in Delhi. The data on the EPR registration of companies has not been compiled, nor is it independently verified. Therefore, this is no information available on the compliance with EPR provisions of the Rules.

Given this situation, the Hon'ble High Court could consider directing the Union Ministry of Environment, Forests and Climate Change (MoEF&CC) to respond to the following and to suggest the plan for improvement with timelines:

1. The need for inventorization of e-waste so that the challenge of management is better understood;
2. The need to ensure that import of e-waste is better regulated and that there is data on what permissions have been given and what is the status of recycling of this imported waste.
3. The need to ensure that 'used' material, which imported without restrictions, is regulated and that information is provided through HS codes so that there is monitoring of this material – quantities and points of use and disposal.
4. The need to ensure that there is stringent monitoring and enforcement of the provisions of the E-Waste Rules 2016 so that ERP targets are met and that there is independent information about where this collected waste is 'recycled'.

5. The need to ensure that there is monitoring of the health and environmental conditions of informal e-waste hubs in the country so that people who are employed here get compensation for ill health. There is also need to ensure that producers of electronic material are held liable for this environmental toxicity.

6. The need to improve and incentivize recycling through mandatory (not voluntary) deposit refund schemes by companies.

The fact is that unsafe recycling of such hazardous e-waste could end up adding massive toxicity to the environment. It is also extremely unsafe for people who work in this informal sector and is adding to their health burden.