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E-WASTE: A LATENT ECONOMIC POTENTIAL

SIDDHARTH RATHORE
ALUMNI
DEPARTMENT OF ECONOMICS
DELHI SCHOOL OF ECONOMICS
UNIVERSITY OF DELHI
NEW DELHI

ABSTRACT

This paper firstly identifies and qualifies the problem of burgeoning e wastes in our cities. In the present scenario this issue is being looked upon as a challenge and as an economic cost to the society whereas this paper highlights the potential that this sector holds in form of economics and business opportunity, like a latent resource waiting to be identified and exploited. We move ahead in this paper by offering one such business and economic model which could transform the urban nightmare into a dividend.

KEYWORDS

E-waste, WEEE, Stakeholders, Venture capitalists, Extended Producer Responsibility.

INTRODUCTION

Like hazardous waste, the problem of e-waste has become an immediate and long term concern as its unregulated accumulation and recycling can lead to major environmental problems endangering human health. The rapid growth of technology, up gradation of technical innovations and a high rate of obsolescence in the electronics industry have led to one of the fastest growing waste streams in the world which consist of end of life electrical and electronic equipment products. It comprises a whole range of electrical and electronic items such as refrigerators, washing machines, computers and printers, televisions, mobiles, i-pods, etc., many of which contain toxic materials.

WHAT IS E-WASTE?

E-waste or waste electrical and electronic equipment (WEEE) refers to consumer and business electronic equipment that is near or at the end of its useful life irrespective of whether they have been sold, donated, or discarded by their original owner. E-waste includes common electronic products such as computers, monitors, cell phones, VCR's, fax machines, stereos which can be reused, refurbished, or recycled but unfortunately makes its way to the nation's growing waste stream.

E-WASTE GENERATION IN INDIA

All over the world, the quantity of electrical and electronic waste generated each year, especially computers and televisions, has assumed alarming proportions. In 2006, the International Association of Electronics Recyclers (IAER) projected that 3 billion electronic and electrical appliances would become WEEE or e-waste by 2010. That would tantamount to an average e-waste generation rate of 400 million units a year till 2010. Globally, about 20-50 MT (million tonnes) of e-wastes is disposed off each year, which accounts for 5% of all municipal solid waste. Although no definite official data exist on how much waste is generated in India or how much is disposed of, there are estimations based on independent studies conducted by the NGOs or government agencies. According to the Comptroller and Auditor- General's (CAG) report, over 7.2 MT of industrial hazardous waste, 4 lakh tonnes of electronic waste, 1.5 MT of plastic waste, 1.7 MT of medical waste, 48 MT of municipal waste are generated in the country annually.¹⁰ In 2005, the Central Pollution Control Board (CPCB) estimated India's e-waste at 1.47 lakh tonnes or 0.573 MT per day.¹¹ A study released by the Electronics Industry Association of India (ELCINA) at the electronics industry expo – "Componex Nepcon 2009" had estimated the total e-waste generation in India at a whopping 4.34 lakh tonnes by end 2009.¹² The CPCB has estimated that it will exceed the 8 lakh tonnes or 0.8 MT mark by 2012.¹³ There are 10 States that contribute to 70 per cent of the total e-waste generated in the country, while 65 cities generate more than 60 per cent of the total e-waste in India. Among the 10 largest e-wastes generating States, Maharashtra ranks first followed by Tamil Nadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Delhi, Karnataka, Gujarat, Madhya Pradesh and Punjab. Among the top ten cities generating e-waste, Mumbai ranks first followed by Delhi, Bengaluru, Chennai, Kolkata, Ahmedabad, Hyderabad, Pune, Surat and Nagpur.

CASE STUDY OF DELHI

Due to the lack of governmental legislations on e-waste, poor standards for disposal and improper mechanism for handling these toxic hi-tech products, e-waste mostly ends up in landfills or partly recycled in unhygienic conditions and partly thrown into waste streams.

Delhi alone gets 20% of the E-waste generated in the developed world which comes through cheaper imports as there is a ready market for glass and plastic here. Over 2,000 trucks ferry e-waste into the capital and dump it in the city's scrap yards. E-waste in Delhi weighs between 10,000 and 12,000 metric tonnes per year which currently employs nearly 30,000 workers in city's scrap yards and various unauthorised recycling units.

With the steadily increasing purchasing power of the middle class, demand for new electronic devices has sky rocketed as people prefer purchasing new machines rather than spending time and money on the refurbishment of old ones. Added to this, there is very little awareness among people about the adverse effects of e-waste on the environment. A combination of these factors could lead to rapid snowballing of the problem; in fact this process has already begun. Therefore there is a need for urgent action on this issue.

ADVERSE EFFECTS OF E-WASTE**HEALTH EFFECTS**

A report by Greenpeace International published in 2005 confirmed that all stages in e-waste processing could release substantial quantities of toxic heavy metals (like lead, zinc, mercury, chromium etc) into environment which can cause damage to the central and peripheral nervous systems, blood system and kidneys as well as serious negative effects on the endocrine system and children's brain development.

CHILD LABOUR

Another dismal outcome of this e-waste is employment of around 5,000 child labourers in the age group of 10 to 15 years in Delhi who work in poorly-ventilated enclosed areas without masks and technical expertise.

EFFECT ON GROUND WATER

Improperly disposed e-waste dumped into landfills leaks harmful chemicals such as lead and cadmium. These leaked chemicals pollute ground water and create septic tanks which jeopardise the health of many poor households apart from being of environmental concern.

HANDLING E-WASTE- PROBLEMS AND SUGGESTIONS

1. STORAGE

The average lifetime of a computer is decreasing, which means that there are more and more computers that are replaced. The potential value for second use decreases with the time of storage, as the equipment becomes increasingly obsolete. The equipment in Delhi is partly kept by consumers for future use, but one of the main reasons is that there is no proper take-back system. Along with a proper take back system the consumers must be given proper incentives to give their computers to a reselling/recycling company. The lack of an appropriate take-back and collection system and also a lack of appropriate incentive structure, causes the loss of control on recycling activities, allowing informal recycling and illegal dumping.

2. REUSE

From an environmental perspective, it is important to encourage the practice of reuse before that of recycling, because reuse allows more material and energy savings. The manufacturing of one desktop computer requires 240 kilograms of fossil fuels, 22 kilograms of chemicals and at least 1,500 litres of water. One should encourage: reuse the first and only then recycle. To achieve this, the government needs to act as a regulatory body overseeing and assisting the operation of any company in this field.

3. STANDARDS OF RECYCLING

Safety standards and work conditions need to be improved. It is important to bring recycling activities from the informal to the formal sector.

4. AMOUNT RECYCLED

The quantity of e-waste recycled is low and some components such as the plastic and the monitors are seldom recycled. In order to increase the quantity recycled, recycling should be promoted as an attractive and profitable field for existing companies and venture capitalists.

5. INFORMAL PROCESSING

Most of the informal collectors and processors do "cherry picking", selling the valuable parts and dumping the rest. In order to separate the valuable parts from the less valuable, collectors have to dismantle the discarded electronics. Activities such as the breaking of the whole monitor to extract the copper yoke, with a high risk to inhale lead from the glass and dissemination of the lead containing glass in inadequate places. These collectors are informal and work independently which makes it complex to control and monitor them. Hence, it is important that any dismantling should be done professionally and under control. The government needs to lay down proper guidelines for, and perhaps also get directly involved in, E-waste processing.

6. FINAL DISPOSING

Since e-waste is considered hazardous waste, it has to be disposed in an authorized hazardous landfill site. This however, should be considered as the ultimate option after reuse and recycling.

TRACING THE PROBLEMS

Above problems can be identified as arising out of the lack of incentives, and the constraints faced by, the following *four* groups:

Government: the government has a responsibility to find solutions to the social and environmental problems generated by e-waste and therefore is a direct stakeholder in the entire exercise. The government currently has no proper guidelines and framework for e-waste management. There is also a lack of technological capability as well as of the funds needed to carry out e-waste management in an eco-friendly manner across the country.

Electronic companies: electronic companies have a social obligation to limit the anti-social outcomes arising out of e-waste as they are the producers of these goods. However, e-waste recycling is not currently an attractive enough area to be taken up as a business on a whole.

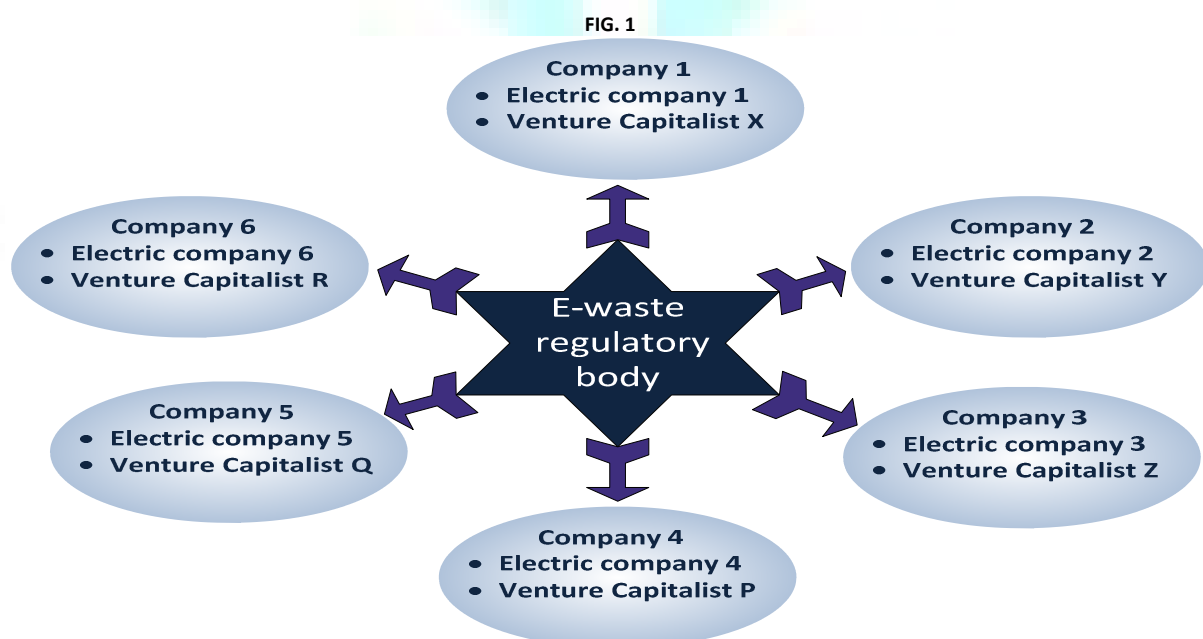
Venture capitalists: e-waste management is a new business in India and currently there are no proper regulations and guidelines in place which diverts these activities towards the informal sector. Apart from this, individual venture capitalists could face the problem of lack of funds and technological know-how.

Consumer: the consumers in India are under the mindset of money being due to them when they dispose off their scrap as most of household scraps including e-waste are sold to local kabadiwallas in exchange for money. This is in contrast to systems in countries like Switzerland where consumers actually pay money for getting their waste recycled. Therefore there is a need to give the consumers some incentive to get their e waste recycled, resold or disposed off by responsible stakeholders in the process. There is also a need to raise awareness among people on this issue.

WHAT DO WE PROPOSE TO RESOLVE THE ISSUE OF E-WASTE

Lack of proper *incentive structure* is the reason why various problems arises related to e-waste and this is what our model aims to address in a manner which not only targets the social and environmental concerns but promotes e-waste recycling as a viable business keeping in mind the social responsibilities and regulations under which works need to be performed in an organized way.

The basic idea is to make handling of e-waste a profitable business which attracts all interested parties to it and hence we suggest formation of companies running under the concept of public private partnership including private venture capitalist, electronic company and government as three stakeholders.



It starts with regulatory body inviting tenders for formation of a company. A private venture capitalist can join hands with any of the electronic companies existing in the country to fill tenders and to create a joint stock company with government.

Roles of various stakeholders in this company would be:*Government*

- 1) Regulatory body
- 2) Framing policies regarding e-waste disposal, recycling etc.
- 3) providing funds
- 4) general management of company

Electronic company

- 1) taking care of technological requirements for upgrading products
- 2) general management of company
- 3) providing funds

Venture capitalist

- investment
- general management of company

WORKING OF THE MODEL

The organization would initiate its activities by providing door to door service to users of electronic goods, who wish to replace or upgrade their existing product. For doing so, the consumer would be paid some competitive amount or be given discount coupon for their next purchase of the product. The prime objective of organization would be to reuse the product, given by the seller, by upgrading it and reintroducing it into the market or providing it to govt. schools, NGO's at a subsidized price.

Now, If the product brought by the organization is not fit enough to reuse and introduce into the market in its original form, then the product would be passed on to the Recycling department of the firm whereby the product would be dismantled and useful parts being separated, for further use in an assembled product or otherwise.

After separation of the useful parts, the leftover would be sent to the Extraction department of the firm where all the possible metals could be extracted from the left over product.

After going through the above stated processes, the residual of all the products left would be shifted to the Dumping department. However it would be mandatory for the department to adhere to the rules and regulations laid down by the govt. pertaining to proper disposal of the waste at approved disposal sites.

WHY THIS PROCESS IS PROFITABLE**VALUE ADDED CENTRES**

The proposed public-private entity could take up more side activities to add value to the waste. These centres could undertake the production of arts and craft items made from recyclables and other materials that have been discarded. Waste-to-art can be lucrative for the crafter, as the raw material - e-waste - is received for free or nearly, and products such as jewellery can be made out of it. Other products such as clocks can be elaborated with an addition of new components. Waste-to art products could be sold in a second hand shop together with refurbished PC's.

Such centres can have a display showing the components of a computer and what can be done with it, explaining the value and hazard of it: they could be considered as a place to carry out awareness raising and for visits by schools etc.

BENEFITS TO THE AGENTS- WHY THIS MODEL IS FEASIBLE**Electronic Company**

The investing electronic co. would have its claim on the profits generated of the firm in proportion to its share in the joint venture. Further, in the stock market, the company's shares would be labelled as green equity as it would be involved in an environment friendly activity. This would potentially enhance the share price of the company too, leading to more investment in the venture.

Consumer

The consumer (seller) could earn a competitive return on his/her product without any hassle due to the door to door service. Further, with the expected rise in share prices of the electronic co. involved, the consumer would be interested in buying its shares and thereby indirectly fund the organization.

Government

The prime objective of the government would be to oversee safe disposal of the waste as well as ensure recycling of the e-waste in adherence with proper guidelines that limit the environmental fallouts of this activity.

DATA SECURITY

Data security has become an extremely important issue in today's competitive and compliant driven scenario of business. Companies planning to get their technology or systems upgraded sometimes buy new computers simply dumping their old ones. What makes them not upgrade existing systems is the concern for their data. It is difficult to make different companies engaged in different activities accountable for data security. But all jobs like recycling, collection etc being done by one company solve this problem.

BENEFIT TO THE SOCIETY AS A WHOLE

This is a model which creates a mechanism wherein all the parties involved have a stake in the proper and safe reuse, recycle, and disposal of e waste. The underlying objective of this model is to limit, and possibly eliminate the serious environmental and human health related problems caused by the rapidly increasing quantities of e-waste in Delhi (and also in other Indian metropolitans). This goal is to be achieved by the two major changes that this model seeks to bring about in the current system-

- A) Recycling activities would be brought from the informal to the formal sector and would only be carried out under the regulations of the government. This is because they would fall directly under the purview of the regulatory body issuing tenders for this purpose.
- B) The technological capacity of India to safely recycle e-waste would be enhanced as more capital for research and development flows in from the private sector.

CONCLUSION

Gandhiji once said that "A technological society has two choices. First, it can wait until catastrophic failures expose systemic deficiencies, distortions, and self-deceptions. Secondly, a culture can provide social checks and balances to correct for systemic distortion prior to catastrophic failures."

The future scenario has, indeed, presented both challenges and opportunities in terms of minimizing wants, managing e-waste as well as developing cleaner and more sustainable products. It is, therefore, important that viable solutions are found so as to convert this threat and challenge into an opportunity to exploit the latent potential benefits from it and develop a sustainable model of urban living.

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