



Illegal import and trade off of e-waste in Bangladesh



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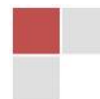
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Introduction

E-waste problems related to trade off and trans-boundary movement in the developing countries address environmental, social, and economic effects. As we know, illegal trade in wastes continues to this day. Interestingly, trends and patterns in waste trade have changed. In recent, most used electrical and electronic equipment (EEE) / products are shipped from the developed countries to the developing countries like Bangladesh.

With its more than 14 million inhabitants and considerable economic growth rates, the local consumption of electrical and electronic equipment (EEE) is growing day by day in Bangladesh. While this growth is desirable from a development perspective and in particular regarding living standard and access to information and communication technologies (ICTs), it also raises the question on sound end-of-life solutions which are not yet in place in the country.

E-waste has become the fastest growing waste stream in Bangladesh and has emerged as a lucrative business. Every year Bangladesh generates roughly 2.7 million metric tons of e-waste. Out of these 2.7 million metric tons, ship breaking industry alone generates 2.5 million metric tons. Bangladesh import scrap ships from developed countries as it has no/inadequate legal rules and regulations to import such highly polluted scrap products and equipments. According to the UNEP study, the developed nations dump e-waste in “developing” Asian countries (India, Bangladesh, China and Pakistan) through illegal trade routes.

Illegal trade off of e-waste

Developed countries have strict rules and regulations to manage their e-waste. On the other hand, developing countries don't have such kind of adequate rules and policies for the management of imported e-waste. Illegal trade of e-waste occurs mainly due to avoid external cost raised from the management of e-waste in developed countries, and to gain economic benefit by importer of developing countries.

Vulnerability of Bangladesh to e-waste

Bangladesh is developing with the increasing of technology usage. Sustainable and safe use of technology can drive an economically developed country. But the wastes from these electronic goods come to us as curse. We consume and dump the useless products without any consideration of environmental damages and sustainability. Moreover, every year significant no. of scrap ships is imported to Bangladesh by importer legally and/illegally. These ships are broken in ship breaking yard located mainly in southern part of Bangladesh. During ship breaking, no. of heavy metals and toxic pollutants emit to environment and oil spills to land and water bodies. As Bangladesh has binding to import scrap ships, thus illegal import and trade off of e-waste is happening by importer to make profit and hence, e-waste vulnerability of Bangladesh is increasing. The scrap ships are carrying large volume of toxics products and electrical & electronic waste, includes: antiques, barometers, clothes irons, electronics, lamps/light bulbs, light switches, paint(Latex), pesticides, television sets, thermometers, mirrors, washing machines, calculators, desktop liquid crystal display(LCD) monitors, laptop, LCD monitors, neon lights, sewer pipes, etc.

E-waste exporting country

Bangladesh imports electronic goods, ship scraps and scrap metal, from developed countries. Brain-damaging mercury and toxic electronic and plastic wastes from the United States; cancer-causing asbestos from Canada; defective steel and tin plates from the European Union, Australia and the U.S.; toxic waste oil from the United Arab Emirates, Iran and Kuwait; toxic zinc ash, residues and skimming; lead waste and scrap; used batteries; and waste and scrap of metals such as cadmium, chromium, cobalt, antimony, hafnium and thallium from Germany, Denmark, the Netherlands, the United Kingdom, Belgium and Norway are all dumped on Bangladesh.

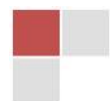




Photo Maro Kouri

Objectives

1. To identify the situation and present scenario of e-waste trade, import and recycling
2. To assess the impact of e-waste on human health
3. To find out the gaps of current legislative and policy of e-waste trade off, disposal and management.

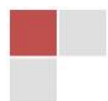
Methodology

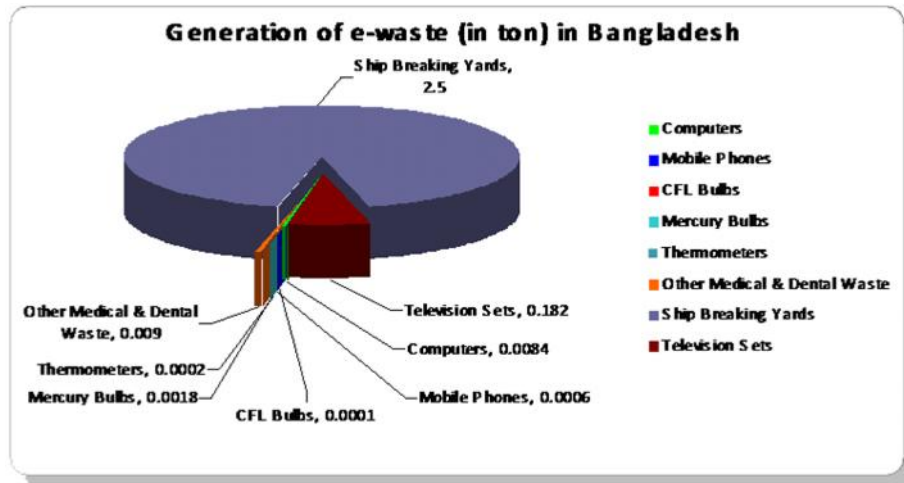
This report has been prepared based on secondary information. Secondary information was collected from online sources like journal, article, magazine and newspaper and book, paper and other relevant documents. E-waste from ship breaking industry and electronic goods such as television, computer, mobile phone, CFL and mercury bulb, laboratory equipment and thermometer are taken into consideration in this study.

Major findings

E-waste in Bangladesh

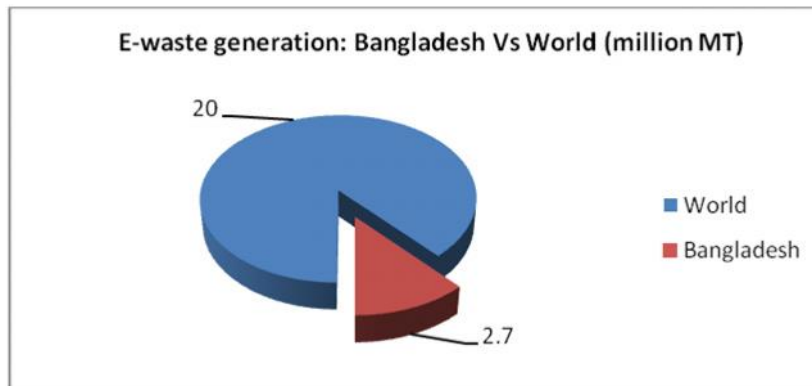
In Bangladesh almost 2.7 million metric tons of e-waste generated per year. According to yearly generation figures, the proportion of E-wastes can be showed by the following graphical representation, where it is too clear that ship breaking yard occupied highest (2.5 million metric tons) position. This sector poses us to be an alarming state. Wastes from television sets have taken the second highest (0.182 million metric tons) position with an exponentially increasing rate.





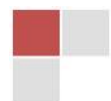
E- waste generation in Bangladesh compared with the world

Bangladesh is one of the highly e-waste generating countries in the world. In Bangladesh about 2.7 million metric tons of e-waste has generated per year, in contrast, it is stated in the report “From E-waste to Resource” that in the world volume of e-waste generated per year is 20 million metric tons. However, according to UNEP projections, an estimated 20-50 million tons of E-Waste is being generated annually in the world.



Illegal import of dry scrap of e-waste in Bangladesh

Bangladesh illegally imports scrap and second hand products from developed countries. The rate of importing second hand products is increasing. Because Bangladesh accrues economic gains from accepting the e-waste by virtue of: recovering valuable materials from disposed electronic products; putting into productive use working-order equipment; and at times, receiving payments from developed nations for accepting e-waste goods. Maritime firms report shows that in year 2008, 2009 and 2010 Bangladesh traded 26.6, 28.3 and 30.0 million tons of deadweight of dry scrap respectively.



Ship breaking yards

Of the approximate 45,000 ocean-going ships in the world about 700 (1.55%) are taken out of service every year. At the end of their sailing life, ships are sold, so that the valuable steel -about 95% of a ships' mass, can be recovered. Bangladesh harbors the second largest ship breaking industries in the world. They are the prime source of raw material including plate, frame, stiffener, longitudinal, pipe, old engine/generator, and even auxiliary machinery, for most of the local private shipbuilding yards. Those are used as raw material in manufacturing and repairing inland shipping fleet.

There are hundreds shipyards and in a workshops at the Department of Shipping in Bangladesh, it has reported in that 124 registered shipyards are present in Bangladesh. Out of these shipyards, approximately 70% are located in and around Dhaka and Narayangong along the side of the river bank of Buriganga, Shitalakha and Meghna. About 20% shipyards of Chittagong division are located along the side of Karnapuli River and 6% are located along the bank of Poshur river of Khulna division and remaining 4% are located in Barishal division. Almost all inland/coastal/bay crossing ships are constructed and repaired locally in these local shipyards.

Location of shipyards in Bangladesh	Percentage
Dhaka and Narayangonj	70%
Chittagong division	20%
Khulna division	6%
Barisal division	4%

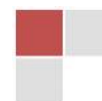


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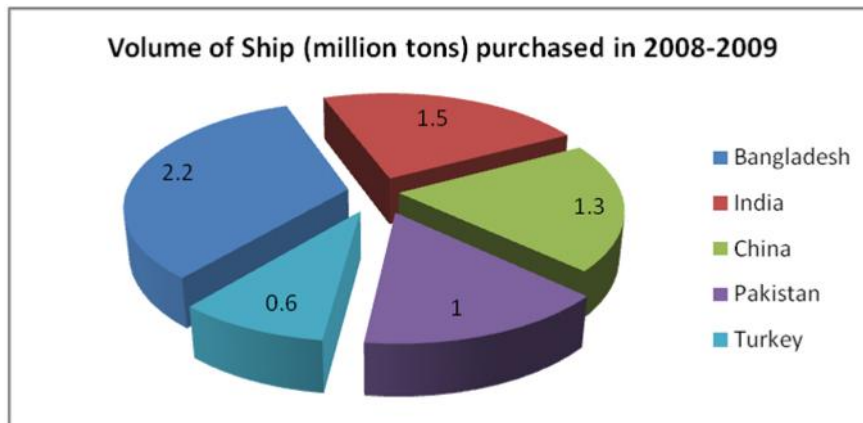
Ship imported in Bangladesh and other developing countries

In Bangladesh, local importers purchased 2.2 million tons of old ships mostly big sized in 2008-09 fiscal against 0.97 million tons over the same period in 2007-08, according to statistics.

The number of ships imported during the fiscal year 2008-2009 was 193 against 120 in 2007-08. India breaks around 1.5 million tons a year followed by China 1.3 million tons, Pakistan 1.0 million tons and Turkey around 0.60 million tons. Moreover, there is no exact figure in fiscal year 2009-2010 and 2010-2011, definitely, volume of ship imported in developing countries much higher compared to the volume of fiscal year 2008-2009.



Bangladesh dismantles nearly 60 per cent of the ships sent to scrap-yards across the globe. The country's ship breakers offer at least 20 to 25 per cent more price than their competitors in India and Pakistan, making Bangladesh the preferred choice for the 'burial ground' of large and medium sized ships.



Recycling

Recycling of scrap and second hand goods and products is one of the profitable businesses in developing countries like Bangladesh where there is no or little environmental regulation or worker health laws to protect the workers who actually attempt to extract valuable portions from used electronics.

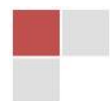
Comparative advantage of E-Waste recycling in Bangladesh

The recycling of electronic components is an extremely labor intensive process and Bangladesh is labor-abundant, rendering them with a comparative advantage in processing e-waste products with respect to developed countries. Hence, it is natural for e-waste exports to flow from the developed countries to developing economies in view of pressure to export these items to cheap labor cost destinations. In addition to cheap labor, there is little in the way of environmental regulation or worker health laws to protect the workers who actually attempt to extract valuable portions from used electronics. As a result, it costs approx. \$20 to recycle a PC in the U.S (and other developed countries), while it costs \$2 in Bangladesh (and other developing countries) due to factors such as prevailing low wages and lack of norms or safeguards for the unorganized sector in Bangladesh.

Impacts of e-waste on human health and environment

E-waste has a direct and visible impact on people's health, environment and livelihoods and is considered to be an unregulated domain. Computers, refrigerators, televisions and mobile phones contain more than 1,000 different toxic materials. Chemicals such as beryllium, found in computer motherboards, and cadmium in chip resistors and semiconductors are poisonous and can lead to cancer. Chromium in floppy disks, lead in batteries and computer monitors and mercury in alkaline batteries and fluorescent lamps also pose severe health risks. A typical personal computer has three to five years of good use before it needs to be replaced or upgraded or completely discarded. The disposal of mobile phone waste is more rapid than computers, as new and cheaper models of mobile phones flood the market every month.

The process of recycling e-equipment is labor intensive, and developing countries being labor-abundant thus possess a comparative advantage in processing e-waste vis-à-vis developed economies. Expectedly, the export of e-waste products (also known as 'e-waste trade') from the developed world to developing countries (in particular Bangladesh, China, India, and sub-Saharan Africa), has become a vast and growing business, as municipalities in capital-abundant, developed economies try to evade high e-waste processing charges associated with expensive labor costs and



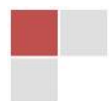
compliance with environmental laws (in other words, e-waste tax) that require e-waste be disposed responsibly. As a result, hundreds of thousands of marginalized, unaware workers (especially women and children) in e-waste receiving countries, involved in informal e-waste scavenging and crude recycling activities, are exposed to e-waste toxins on a daily basis, which puts at serious risk their, as well as their communities', well-being.

On the other hand, developing countries accrue economic gains from accepting the E-waste by virtue of: recovering valuable materials from disposed PCs; putting into productive use working-order equipment; and at times, receiving payments from developed nations for accepting E-waste goods.

E-waste is much more hazardous than many other municipal wastes because electronic gadgets contain thousands of components made of deadly chemicals and metals like lead, cadmium, chromium, mercury, polyvinyl chlorides (PVC), brominated flame retardants, beryllium, antimony and phthalates. Long-term exposure to these substances damages the nervous systems, kidney, and bones, reproductive and endocrine systems. Some of them are carcinogenic and neurotoxic. A typical computer processor and cathode ray tube (CRT) monitor contain five to eight pounds of lead and other heavy metals such as cadmium and mercury. A study conducted by Greenpeace in 2005 in electronic recycling yards clearly indicates the presence of high levels of hazardous chemicals including dioxins and furans in the areas where this primitive / unauthorized recycling takes place. Disposal of e-wastes is a critical problem faced and poses a threat to both health and vital components of the ecosystem. There are number of channels through which e-waste goes to the environment. E-waste that is land filled produces contaminated leachates, which eventually pollute the groundwater. Acids and sludge obtained from melting computer chips, if disposed on the ground causes acidification of soil, leading to contamination of water resources. Incineration of e-wastes can emit toxic fumes and gases, thereby polluting the surrounding air.

Improper recycling and recovery methods can have major impacts on the environment. Crude forms of dismantling can often lead to toxic emissions, which pollute the air and thereby also expose the workers to the harmful materials. The most dangerous form of recycling and recovery from e-waste is the open air burning of circuit boards (made of plastic) in order to recover copper and other metals. Extraction of metals through acid bath method or through mercury amalgamation also contributes to environmental degradation.

The toxic materials present in the equipments can be environmental as well as health hazard. Mercury will leach when certain electronic devices, such as circuit breakers are destroyed. Not only does the leaching of mercury pose problems, the vaporization of metallic mercury and dimethylene mercury is also of concern. The same is true for polychlorinated biphenyls (PCBs) from condensers. When brominated flame retardant plastic or cadmium containing plastics are land filled, both polybrominated diphenyl ethers (PBDE) and cadmium may leach into the soil and groundwater. It has been found that significant amounts of lead are dissolved from broken lead containing glass, such as the cone glass of cathode ray tubes, gets mixed with acid waters and are a common occurrence in landfills.



In ship breaking industry with more than 1,000 workers killed on the job since 1996.

Health hazards: (From e-waste containing mercury, lead, cadmium)

Mercury	Lead	Cadmium
Brain disorders, Kidney, renal and neurological damage, Leading to even death.	Learning disabilities, Mental retardation, Behavioral problems, Hearing impairment.	Lung damage, Fragility of bones, High blood pressure, Nerve and brain damage, Kidney and liver disease.

E-waste needs to be handled safely so that it does not jeopardize either the workers involved in recycling or the environment. Almost all electronic and electrical appliances, like computers, mobile phones, iPods, refrigerators, washing machines, televisions etc, constitute e-waste after being discarded. These products are stripped down to yield valuable metals like platinum, gold and copper.

International trade of second hands may prolong duration of products, since there is demand for secondhand electronics in low income countries; it becomes waste in importing country. As part of the trans-boundary movement of e-waste is now a establish trade in Bangladesh.

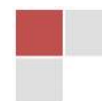
As information technology has rapidly advanced and the volume of electronic devices markedly surged, an increasing amount of obsolete electronic devices starts to pile up at almost every corner of the world at uneven rates. A wide, growing range of electronic devices, such as TV, refrigerators, hand-held cellular phones, and computers, are now also known as electronic waste, which in total can contain up to 1000 toxic substances, including lead, chromium, and plastic additives. Often rich in precious metals and other reusable materials such as plastics, e-waste has been perceived as a source of additional income by more and more peasants and unemployed laborers in Bangladesh.

Gaps of current legislation and policy

There is no legal permission in the rules of Bangladesh to trade off e-waste and its disposal and management. Bangladesh is a signatory to the Basel Convention prohibiting trans-boundary movement of hazardous waste. Import of any kind of waste requires government permission.

There is no comprehensive electronic waste (e-waste) policy, although it is briefly mentioned just as an action item in the country's ICT policy. The government established the Department of Environment (DoE) in 1977 under the Environment Pollution Control (EPC) Ordinance, 1977. Then in 1989, as pollution and environment got more attention, the Ministry of Environment and Forest was established as the apex body. The National Environmental Policy, highlighting the regulation of all activities that pollute and destroy the environment, came into effect in 1992. The subsequent Environment Conservation Act (ECA), 1995, authorized the DoE to undertake any activity necessary to conserve and enhance the quality of the environment and to control, prevent and mitigate pollution. The DoE was also mandated to give clearance on environmental issues for any new project.

The subsequent rules under the ECA, the Environment Conservation Rules of 1997, divided industries and projects into different categories depending upon the pollution load and likely impact on the environment. There are some provisions and mandatory rules to build a waste management system within the industry sectors. However, e-waste does not require any compliance under the Act or Rules. The government is now preparing a solid waste management policy which may cover e-waste. At the same time, the Medical Waste Management Rules, 2008, address waste management issues for the medical sector, including e-waste.



Recommendations and conclusion

Electronic waste (e-waste) has emerged as a new policy priority around the world. Motivations to address e-waste include rapidly growing waste streams, concern over the environmental fate of heavy metals and other substances in e-waste, and impacts of informal recycling in developing countries. Policy responses to global e-waste focus on banning international trade in end-of-life electronics, the premise being that e-waste is mainly generated in the developed world and then exported to the developing world. Sales of electronics have, however, been growing rapidly in developing nations, raising the question of whether informal recycling in developing countries driven by international trade or domestic generation.

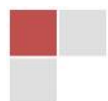
Bangladesh is being used as dumping grounds for used computers, monitors, mobile phones and other electronic items. The entire trade route of this e-waste import needs to be investigated for proper action.

Bangladesh need to formulate dedicated policies and legislation focused on e-waste challenges. Policies or acts relevant to e-waste management need to be brought under one umbrella. Often multiple plans or policies work without any interconnection.

Bangladesh does not have comprehensive policies nor the capacity to handle e-waste challenges.

The following actions are proposed:

1. Awareness campaign: This should include both the traditional media (newspapers, TV) and new media (web, blogs, and social networks). The campaign should address policy makers as well as the general public.
2. Baseline and action research: It is important to understand the current and future impacts of e-waste in the country. More research has to be done to find the current status and identify the future trends.
3. Policy advocacy: A solid waste management policy is underway in the country. However, no e-waste policy is in sight. Bangladesh needs a comprehensive e-waste policy. The policy advocacy plans should include a facts-based campaign targeting policy makers, and efforts to sensitize lawmakers.
4. Pilot projects: Based on the research findings, the government should launch pilot initiatives to establish environmentally and socially friendly e-waste recycling processes in the country.



References

- **Asha Krishnakumar**, 2003. India's National Magazine. Volume 20 - Issue 25, December 06 - 19, 2003
- **FIDH**. 2002. Where do the “floating dustbins” end up? Labour Rights in Shipbreaking Yards in South Asia The cases of Chittagong (Bangladesh) and Alang (India).(Investigative Mission Report) .International Federation for Human Rights.No. 348/2, December 2002, Paris. pp 84.
- **Gaurav Relhan**, 2010. Theorizing the Economics of E-Waste Trade: Issues, Analysis and Strategies. Master of Arts in Law and Diplomacy Thesis, The Fletcher School, Tufts University. <http://fletcher.tufts.edu>.
- **Greenpeace**. 2005. Ship breaking. Ship breaking site English. Available at www.greenpeaceweb/shipbreak.org.
- **K. Shahriar Iqbal, N. M. Golam Zakaria and Kh. Akhter Hossain**, 2010. Identifying and Analysing Underlying Problems of Shipbuilding Industries in Bangladesh. *Journal of Mechanical Engineering, Vol. ME 41, No. 2, December 2010 Transaction of the Mech. Eng. Div., The Institution of Engineers, Bangladesh.*
- **Partha Sarker and Munir Hasan**. Bytes for All. www.bytesforall.net.
- **Md. M. Maruf Hossain and Mohammad Mahmudul Islam**, 2006. Ship Breaking Activities and its Impact on the Coastal Zone of Chittagong, Bangladesh: Towards Sustainable Management. Published by Young Power in Social Action (YPSA).
- **Robinson BH**, 2009. E-waste: an assessment of global production and environmental impacts. *Sci Total Environ.* 2009 Dec 20; 408 (2):183-91. Epub 2009 Oct 20.
- **Study on E-waste: Bangladesh situation**, 2011, published by Environment and Social Development Organization-ESDO.

