THE TOXIC BELT: PERSPECTIVES ON E-WASTE DUMPING IN DEVELOPING NATIONS

Manasvini Krishna & Pratiksha Kulshrestha[*]

ABSTRACT

This article concentrates on the plight of developing nations of the world, as they totter under an increasing burden of the world's electronic waste. Dismantled parts of electronic goods are toxic – dangerous to both the health of workers handling them, as well as to the environment. Third world nations are the worst hit, due to poverty, low awareness, and general vulnerability. We have attempted to analyze the causes, effects, and potential solutions to this problem.

This article surveys the problem of electronic waste within the international legal framework, with special emphasis on the domestic setup of India and China, chosen as examples of leading developing countries. We argue that the protection level offered by these countries and by developing countries in general, is inadequate. We propose potential fixes for developing countries.

INTRODUCTION

> *The scene is a scrap-yard. Hundreds of semi-starved workers, including small children, toil away day and night, dismantling electronic products. Little do they know that the dismantled parts of the computers, radios and other gadgets they are working on are toxic, capable of causing them deadly diseases.*

This is the reality for thousands of people in developing countries around the world.[1] Electronic scrap is imported into these countries, including India, China, and the nations of Africa, cashing in on the cheap labor they offer, and taking advantage of their weak environmental laws.

[*] B.A. LL.B (Hons.) Students, National Law Institute University. The authors would like to thank Dr. Kondaiah Jonalagadda, National Law Institute University, Bhopal, for his valuable advice and guidance.

[1] Though international organizations like the WTO have not precisely defined the term 'developing countries,' the term generally covers countries characterized by poverty, illiteracy, lack of awareness and technical know-how, low Human Development Indexes and under-developed human rights regimes.

Other nations conveniently unload their hazardous waste on the developing countries, at the cost of the environment and the health of the local populace. The magnitude of the problem is alarming. For instance, in New Delhi, about 15,000 Personal Computers ("PCs") are dismantled per year.[2]

This article argues that international and domestic laws have not dealt with the issue of electronic waste management and disposal adequately. We have attempted to sketch the perspective of developing nations, the principal victims of the phenomenon of e-waste dumping.

Part One of this article deals with the consequences of e-waste dumping, the vulnerability of developing nations to this problem, and an assessment of the present regime of international and domestic laws focusing on the issue. Part Two analyzes the situation in China and India, chosen as examples of developing countries menaced by the hazards of e-waste dumping. Part Three suggests legislative guidelines to help developing countries deal with e-waste, and Part Four concludes the article.

I. CONSEQUENCES OF HAZARDOUS E-WASTE DUMPING

A. ENVIRONMENTAL EFFECTS

Electronic waste invariably harms the environment. Computers and other electronics include toxic substances (like lead, cadmium, mercury, and plastics)[3] and precious metals (like platinum, gold, and silver).[4] Usually, the precious metals are extracted from the electronic goods, and the remainder of the dismantled products is burned or discarded in landfills.[5]

B. HEALTH HAZARDS

Electronic and electrical products make life comfortable, but are a Pandora's Box once discarded. E-waste contains a brew of toxic substances, such as lead (responsible for causing damage to the central and peripheral nervous system, circulatory system, kidney, reproductive system, and

[2] E-WASTE IN INDIA: SYSTEM FAILURE IMMINENT – TAKE ACTION NOW! (2004), *available at* http://toxicslink.org/docs/06040_repsumry.pdf (last visited Jan. 24, 2009).

[3] *See* Jennifer Kutz, *You've Got Waste, The Exponentially Increasing Problem of Hazardous E-waste*, 17 VILL. ENVTL. L.J. 307, 309-11 (2006).

[4] *See* Press Release, United Nations University, UN, Industries, and Others Partner to Create World Standards for E-Scrap Recycling, Harvest of Valuable Components, U.N. Doc. MR/E11/07 (Mar. 6, 2007), *available at* http://www.unu.edu/media/archives/2007/files/mre11-07.pdf.

[5] *See* Nisha Thakker, *India's Toxic Landfills: A Dumping Ground for the World's Electronic Waste*, 6 SUSTAINABLE DEV. L. & POL'Y 58, 58 (2006).

endocrine system, as well as slowing brain development in children),[6] cadmium (widely believed to cause irreversible effects on human health upon accumulation in the human body, particularly the kidneys),[7] mercury (responsible for causing damage to various organs including the brain and kidneys, as well as to fetuses),[8] chromium-VI (causing toxic effects in the cells and damage to DNA),[9] plastics[10] (including PVC),[11] Brominated Flame Retardants (BFRs),[12] and beryllium (which can cause lung cancer and beryllicosis).[13]

C. FACTORS LEADING TO THE VULNERABILITY OF THE DEVELOPING NATIONS

1. Poverty

"Poverty is the reason people have been lured into accepting substances

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[6] *See* Technology Transfer Network Air Toxics Web Site, *Lead Compounds*, U.S. ENVTL. PROTECTION AGENCY (2000), http://www.epa.gov/ttn/uatw/hlthef/lead.html (last visited Jan. 24, 2009).

[7] *See* OCCUPATIONAL SAFETY & HEALTH ADMIN., U.S. DEP'T OF LABOR, CADMIUM HEALTH EFFECTS (2005), http://www.osha.gov/SLTC/cadmium/recognition.html (last visited Jan. 24, 2009).

[8] *See* OFFICE OF RESEARCH FACILITIES, NATIONAL INSTITUTES OF HEALTH, MERCURY HEALTH HAZARDS (2006), http://orf.od.nih.gov/Environmental+Protection/Mercury+Free/MercuryHealthHazards.htm (last visited Jan. 24, 2009).

[9] U.S. ENVTL. PROTECTION AGENCY, *supra* note 6.

[10] *See generally* Jan H. Schut, *Recycling E-Plastics: New Material Stream Brings Its Own Set of Problems*, PLASTICS TECH., Aug. 2007, *available at* http://www.ptonline.com/articles/200708fa2.html. For a comprehensive study of the adverse effects of plastics, *see* EcologyCenter.org, Adverse Health Effects of Plastics, http://www.ecologycenter.org/factsheets/plastichealtheffects.html (last visited Jan. 24, 2009).

[11] The dioxin forming property of PVC qualifies it as a highly toxic substance, capable of causing cancer, reproductive, developmental (birth defects and genetic changes) and immunity problems. Secondly, the large toxic additives (used for making PVC plastic stable and usable) released during the use and disposal of PVC products enhance human exposures to phthalates, lead, cadmium, tin and other toxic chemicals. *See* Michael Belliveau & Stephen Lester, Ctr. for Health, Env't, & Just. and Envtl. Health Strategy Ctr., PVC: BAD NEWS COMES IN 3'S – THE POISON PLASTIC, HEALTH HAZARDS AND THE LOOMING WASTE CRISIS (2004), *available at* http://www.watoxics.org/files/pvc-bad-news.pdf.

[12] BFRs are believed to cause cancer of the digestive and lymph systems. BFR exposure in early life has been found to affect the neural system. *See* Iowa Dep't of Nat. Res., Environmental and Health Hazards of Electronic Waste, http://www.iowadnr.com/waste/recycling/hazards.html#flame (last visited Jan. 24, 2009).

[13] AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, U.S. DEP'T OF HEALTH & HUM. SERVS., TOXFAQS FOR BERYLLIUM (2002), *available at* http://www.atsdr.cdc.gov/tfacts4.pdf (last visited Jan. 24, 2009).

that otherwise they would not have."[14] Poverty is probably the root cause of the problem; developing nations are invariably poor, though abundant in cheap labor. The cost of recycling scrap is therefore very low. For example, the cost of recycling a computer in the United States is $20, while it costs only $2 in India, resulting in a savings of $18 if the computer is exported to India.[15]

The possibility of better earnings lures uninformed laborers to endure long shifts working on e-waste, ignorant of the fact that the electronics they touch every day are lethal. Importers from developing countries even buy these goods to recycle them.[16] The importers extract the usable parts and then proceed to dump the rest in landfills. Countries like India, China, and Nigeria have emerged as the most attractive destinations of e-waste dumping, due to the availability of cheap labor.

2. Legal Laxity

Governments in developing nations may not enact adequate labor and environmental laws. This may be due to internal and international pressure, or may be the result of ignorance or negligence of the impending dangers. Since the citizenry is unaware of the gravity of the situation, they do not insist on preventive or remedial action. Even when e-waste legislation exists, the problem of overpowering corruption[17] stands in the way of effective implementation.

D. INTERNATIONAL PROTECTION AND EFFICACY

The concern for sustainable development – and in recent times, for safe disposal of waste – has been at the heart of several international endeavors. The Declaration of the United Nations Conference on the Human

[14] A.M. Poropot, J. Douglas & S. Ibrahim, *Nigeria Waste Imports From Italy*, TRADE ENVIRONMENT DATABASE, http://www.american.edu/projects/mandala/TED/nigeria.htm (last visited on Jan. 24, 2009).

[15] *See* Satish Sinha, *Downside of the Digital Revolution*, TOXICS LINK (2007), http://www.toxicslink.org/art-view.php?id=124 (last visited Jan. 24, 2009).

[16] "E-waste brokering is an aggressive and very competitive business, and it is not difficult to find buyers for all kinds of E-waste for the Asian market." JIM PUCKETT ET AL., EXPORTING HARM: THE HIGH-TECH TRASHING OF ASIA 12 (2002), *available at* http://www.ban.org/E-waste/technotrashfinalcomp.pdf.

[17] Transparency International ranks most developing nations as the highest in corruption, establishing a clear link between poverty and corruption. China and India are presently tied at 72nd in corruption rankings. TRANSPARENCY INT'L, GLOBAL CORRUPTION REPORT 2008, 297 tbl.5 (2008), http://www.transparency.org/publications/gcr/download_gcr (click "Download the book as a single document") (last visited Jan. 24, 2009).

Environment (Stockholm, 1972),[18] Johannesburg Declaration on Sustainable Development,[19] Agenda 21,[20] the Cairo Guidelines and Principles for the Environmentally Sound Management of Hazardous Wastes,[21] Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods,[22] and Lomé IV Convention,[23] represent

[18] The Stockholm Conference was the first landmark international endeavor aimed at carving a niche for man in harmony with nature. The Declaration of the United Nations Conference on the Human Environment laid down twenty-six "principles" which cover a broad spectrum of ecological rights and duties of man and states. *See* Conference on the Human Environment, *Declaration of the United Nations*, U.N. Doc. A/CONF.48/14/Rev.1 (Jun. 5-16, 1972). An Action Plan was also adopted, which may be divided into three parts:

(a) Earth Watch Programme;

(b) Environment Management;

(c) Supporting Measures such as education, training, public information and finance. *See* Action Plan, *available at* http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=97&ArticleID=1512&l=en (last visited Jan. 24, 2009).

[19] In 2002, at Johannesburg, the world community reaffirmed its commitment for sustainable development, for "building a humane, equitable and caring global society, cognizant of the need for human dignity for all." The members undertook "a collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development – economic development, social development and environmental protection – at the local, national, regional and global levels." *See* World Summit on Sustainable Development, *Johannesburg Declaration on Sustainable Development*, art. 5, U.N. Doc. A/CONF.199/20 (Sept. 4, 2002).

[20] Agenda 21 embodies a very comprehensive action plan to mitigate economic inequity and ecological destruction. Unfortunately, the document is not legally binding and has mere persuasive value. It embraces within its scope several aspects of sustainable development like poverty, consumption patterns, health, human settlements, financial resources, technological transfer, energy, climate, etc. *See* Agenda 21, *available at* http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21toc.htm (last visited Jan. 24, 2009).

[21] The Cairo Guidelines and Principles for Environmentally Sound Management of Hazardous Waste adumbrate a scheme for 'environmentally sound transport, handling (including storage) and disposal of toxic and dangerous wastes'. *See* Cairo Guidelines and Principles for the Environmentally Sound Management and Disposal of Hazardous Wastes, Annex II, U.N. Doc. U.N.E.P./GC.14/17 (1987), *reprinted in* Final Report of the Working Group, Annex III, U.N. Doc. U.N.E.P./WG.122/3, (1985). However, being guidelines, they are merely recommendatory in character. *See* PHILLIPE SANDS, PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW, CAMBRIDGE UNIVERSITY PRESS, 676-77 (2003).

[22] The Recommendations of the United Nations Committee of Experts on the Transport of dangerous goods primarily focus on prevention of environmental hazards caused by accidents. The Model Regulations classify the goods on the basis of the risk involved and accordingly prescribe the appropriate mode of transport for each class. As far as the issue of waste is considered, it merely prescribes the proper mode of its transport in accordance with the norms laid down for the class in which they fall. The recommendations are not binding; they serve as a 'model' that the states are expected to follow. Secondly, their scope is also very limited, and they exempt from their scope bulk transport of dangerous goods in sea-going or inland navigation bulk carriers or tank-vessels, subject to special international or national regulations. *See* Recommendations on Transport of Dangerous Goods: Model Regulations, Vol. 15

some of these efforts. The following are some significant measures adopted by the international community.

E. BASEL CONVENTION

The Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal,[24] which came into force in 1992, is a global environmental agreement on hazardous waste. It has 170 signatories, and primarily aims to protect human health and the environment from the adverse effects of hazardous wastes.[25]

> Article 1 (1) of the Convention defines "hazardous wastes" as:
>
> (a) Wastes that belong to any category contained in Annexure I, unless they do not possess any of the characteristics contained in Annexure III; and
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> (b) Wastes that are not covered under paragraph (a) but are defined as, or are considered to be, hazardous wastes by the domestic legislation of the Party of export, import, or transit.

The Convention explores the movement and generation,[26] environmentally sound disposal,[27] import and export,[28] and notifications

(revised ed.), *available at* http://www.unece.org/trans/danger/publi/unrec/rev15/15files_e.html (last visited Jan. 24, 2009).

[23] The State parties are obliged to endeavor to control international movement of hazardous waste and radioactive waste by prohibiting all direct or indirect export and import of such waste in the area governed by it. *See* Fourth ACP-EEC Convention of Lomé, art. 39 (Dec 15, 1989), *unofficial translation at* http://www.acpsec.org/en/conventions/lome4_bis_e.htm. The Convention does not define the term 'hazardous substances'; on the contrary, it simply refers to the products listed in Annexures 1 and 2 to the Basel Convention. *See infra* note 24. 'Radioactive waste' has also not been defined and purports to adopt the applicable definitions and thresholds laid down in the framework of the IAEA. *Id.*

[24] Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (1992), http://www.basel.int/text/con-e-rev.pdf [hereafter Basel Convention].

[25] *Id.*

[26] *See, e.g.*, *id.* at Preamble; *id.* art. 6 (dealing with transboundary movement between parties); *id.* art. 7 (dealing with transboundary movement of hazardous waste or other wastes from Party through non-party states).

[27] *See, e.g., id.* pmbl., art. 4(2) (laying down obligation on party states to ensure environmentally sound disposal of waste. However, most of these obligations do not talk in terms of elimination of waste but in terms of minimization of wastes); *see also id.* arts. 8, 9(3).

[28] *See, e.g., id.* at art. 4 (prescribing several obligations with respect to import and export of hazardous wastes or other wastes which state parties must perform). Article 4(1)(a) goes a step further and speaks of the right to prohibit the import of hazardous wastes or other wastes for disposal of the state parties. *See id.* art. 4(1)(a).

related to hazardous and other waste.[29] The Convention also develops a mechanism for international cooperation for regulating trading and trafficking in hazardous substances.[30] It imposes a duty to re-import the hazardous substances on the exporter of e-waste.[31]

F. THE WEEE AND ROHS DIRECTIVES

Several independent endeavors of EU countries (Austria,[32] Belgium,[33] Denmark,[34] Germany,[35] Italy,[36] the Netherlands,[37] Sweden,[38] and the United Kingdom[39]) culminated in the 2001 enactments of the Waste Electronic and Electrical Equipment (WEEE) Directive[40] and the 2002 Restrictions of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive.[41] These Directives obligate member states to legislate in consonance with them, and establish a unified approach to e-waste disposal.

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[29] *See, e.g.*, *id.* art. 6(1) (providing for notification by state, generator, or exporter, in writing, for any proposed transboundary movement of hazardous wastes or other wastes).

[30] *See id.* art. 10.

[31] *Id.* art. 8.

[32] "Austria assessed fees to consumers at both ends of a product's life." *See* Joel Boon, Note, *Stemming the Tide of Patchwork Policies: The Case of E-waste*, 15 TRANSNAT'L L. & CONTEMP. PROBS. 731, 736 (2006).

[33] Under Belgian law, "manufacturers and retailers were to take back white goods (major household electrical appliances such as refrigerators) and brown goods (household electrical entertainment appliances) for free." *Id.*

[34] "In Denmark, local government authorities were charged with collecting and recycling electronic equipment, with costs covered through taxes or collection fees." *Id.*

[35] Germany's system was founded on the principle of shared responsibility – the local authorities were to collect the e-waste and the producers were to be responsible for its treatment and proper disposal. *Id.*

[36] In Italy "a system of nationwide collection centers and recovery facilities to which consumers could bring their used goods." *Id.*

[37] In the Netherlands consumers are to return e-waste without charge to the retailers or to the local authorities, and manufacturers are to treat it. Further, landfilling or incineration of e-waste was banned and collection and recovery targets for e-waste were set. *Id.* at 736-37.

[38] In Sweden, the consumers were permitted "to take e-waste back to retailers or municipal collection points before being recycled by manufacturers or municipalities." *Id.* at 737. Sweden also banned the landfilling and incineration of e-waste. *Id.*

[39] In the United Kingdom, endeavors to manage e-waste were initiated as a voluntary partnership with industry. *See* Robert M. Sussman & Greg S. Slater, *Domestic Legislation with Cross-Border Implications: International Trends in Product Take-Back Requirements*, 1997 A.L.I. 183, 201.

[40] Directive of the European Parliament and of the Council of 23 January 2003 on Waste Electric and Electronic Equipment (WEEE), Directive 2002/96/EC, 2003 O.J. (L 37) 24 [hereafter WEEE Directive].

[41] Council Directive 2002/95/EC, *Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment*, 2003 O.J. (L 37) 19 (EC) [hereafter RoHS Directive].

The WEEE Directive covers a wide range of consumer products,[42] and governs issues pertaining to product design, collection, treatment, recovery, financing, consumer information, and penalties.[43] The product design provision focuses on encouraging producers to improve their recycling methods, and the life of the products.[44] The collection provision provides for the establishment of e-waste collection centers by producers (manufacturers, sellers, and distributors) for collection of e-waste from final holders and distributors free of charge.[45] The WEEE Directive also addresses e-waste siting, storage, and treatment.[46] It requires producers to absorb the costs of collection, treatment, and disposal for household and non-household e-waste, including products placed on the market before August 13, 2005.[47] The producers must also furnish information about the treatment of their electronic products. For instance, packaging must include a specified symbol, a crossed-out garbage bin, which informs the consumer that the electronic waste must be collected separately from other waste.[48] For the purposes of accountability, the WEEE Directive requires member states to update the Commission on their compliance with the Directive.[49]

The RoHS Directive concentrates on discontinuing the use of specified

[42] The products covered under the ambit of the WEEE Directive include large and small household appliances, information technology (IT) and telecommunications equipment, consumer equipment, lighting equipment, many electrical and electronic tools, monitoring and control instruments, automatic dispensers, several medical devices, toys, leisure, and sports equipment. *See* WEEE Directive, *supra* note 41, at Annexure IA. However, a category of electrical and electronic devices including military purposes, large-scale, stationary industrial tools, and all implanted and infected medical devices have specifically been exempted from the scope of the WEEE Directive. *See* WEEE Directive, *supra* note 41 art. 2, Annex IA.

[43] *Id.* arts. 4-10, 15.

[44] *Id.* art. 4.

[45] *Id.* art. 5.

[46] *Id.* at Annexures II, III.

[47] *Id.* art. 9. An exception to the requirement that producers must pay for products placed on the market before August 13, 2005 was introduced by way of an amendment to art. 9 of the WEEE Directive in order to reduce the excessive financial burden being cast upon the producers. *See* Council Directive 2003/108/EC, *amending* Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE), 2003 O.J. (L 345/106) [hereafter WEEE Amendment]. The exception provides that where the old equipment is not being replaced by new equivalent products or by new products fulfilling the same function, non-household users may finance the costs for its safe disposal. Amended Article 9 (1), Council Directive 2003/108/EC amending Directive 2002/96/EC *available at* http://eurlex.europa.eu/LexUri Serv/LexUriServ.do?uri=CELEX:32003L0108:EN:HTML (last visited Jan. 24, 2009). Member States have been given the option to assess part or all of the cost to the non-household user. *Id.*

[48] WEEE Amendment**,** *supra* note 47, Annex IV.

[49] *Id.* art. 12.

hazardous substances in electronic and electrical products.[50] For example, it bans the use of lead, mercury, hexavalent chromium (chromium VI), cadmium, and two brominated flame retardants – polybrominated biphenyls (PBBS) and polybrominated diphenyl ethers (PBDEs), with certain exemptions, which are subject to periodic review.[51]

The WEEE and RoHS regulate a similar range of products. WEEE adopts a prescriptive approach, clearly outlining the minimum standards of protection to be followed.[52] RoHS adopts a prohibitory approach, specifying the outer limits for the restrictions.[53] The scope of legislative autonomy under WEEE is broader than that afforded under RoHS. This reflects the differing rationales of each directive. The WEEE Directive is guided by the concern for waste management and the establishment of an environmental protection regime, whereas the RoHS adopts a pragmatic approach in view of the interests of the international trader, as its prohibitions tend to create trade distortions.

G. BAMAKO CONVENTION

Disillusioned by the inefficacy[54] of the Basel Convention in dealing with the problem of Transboundary movement of Hazardous Waste, the members of the Organization for African Unity (OAU) solicited regional cooperation for tackling the problem. The concern fructified in the adoption of the Bamako Convention[55] by fifty-one African countries. The Bamako Convention bans the import and trafficking of hazardous waste into Africa, and controls the waste's movement within Africa.[56]

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[50] RoHS Directive, *supra* note 41, art. 4.

[51] *Id* art. 4(1).

[52] *See* WEEE Directive, *supra* note 40, Annex II.

[53] *See, e.g.*, Annex provides "Mercury in compact fluorescent lamps not exceeding 5 mg per lamp," clearly outlining the limit beyond which the presence of mercury in fluorescent lamp is impermissible. *See* RoHS Directive, *supra* note 41, Annex.

[54] The Nigeria-Italy Waste Trade Case, for example, underlines the fact that illegal trade in hazardous substances flourished unabated in the Post-Basel years. In this case, Italian Companies contracted with a Nigerian businessman to use his property for storing large volumes of 'hazardous waste.' *See* Poropot & Ibrahim *supra* note 14; *see also* Kwado Tutu, *Bamako Convention and Good Management of Hazardous Waste*, http://www.basel.int/legal matters/regworkshops/ethiopia/bamako.ppt (last visited Jan. 24, 2009) (discussing instance of 120 drums of mercury contaminated e-waste imported annually since 1986, from USA into South Africa).

[55] Bamako Convention on the Ban of the Import Into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes Within Africa (Jan. 30, 1991), http://www.ban.org/Library/bamako_treaty.html [hereafter Bamako Convention].

[56] *Id.* pmbl., art. 4.

The Bamako Convention subscribes to the precautionary principle.[57] It focuses on reducing the generation of waste by adopting clean production methods. This approach is more effective than the permissible emissions approach, which is based on assumptions about the environment's assimilative capacity.

Article 1 of the Bamako Convention defines "waste" as "substances or materials which are disposed of, or are intended to be disposed of, or are required to be disposed of by the provisions of national law."

> Article 2 (1) defines "hazardous wastes" as:
>
> (a) Wastes that belong to any category contained in Annex I of the Convention;
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> (b) Wastes that are defined as, or are considered to be, hazardous wastes by the domestic legislation of the State of import or transit;
>
> (c) Wastes which possess any of the characteristics contained in Annex II of the Convention;
>
> (d) Hazardous substances which have been banned, cancelled or refused registration by government regulatory action, or voluntarily withdrawn from registration in the country of manufacture, for human health or environmental reasons.

Unlike the Basel Convention, the Bamako Convention does not exclude radioactive materials from its definition of hazardous waste. Thus, the scope of the Bamako Convention is greater than that of the Basel Convention.

In tune with the above, member states are obliged to define[58] and prescribe requirements for hazardous wastes and their transboundary movement.[59] The Bamako Convention imposes strict, unlimited liability, as well as joint and several liability on hazardous waste generators,[60] and punishes the trafficking and import of hazardous waste.[61] The Bamako Convention also requires states to ensure that the exporter of hazardous

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[57] According to the Precautionary Principle, preventive regulatory actions should be adopted for the purposes of environmental protection even in the absence of a conclusive scientific proof that a given substance or activity harms the environment. *See generally* Sonia Boutillon, Note, *The Precautionary Principle: Development of an International Standard*, 23 MICH. J. INT'L L. 429 (2002).

[58] *See* Bamako Convention, *supra* note 55, art. 3.

[59] *See id.* arts. 4, 6; *see also* Annex IV B.

[60] *See id.* art. 3.

[61] *Id.* art. 9(2).

waste by a party to the Convention re-imports the waste.[62] Finally, the Bamako Convention creates a regional framework to facilitate cooperation and the monitoring of the member states' endeavors, through the Secretariat.[63]

H. REACH

REACH, which stands for Registration, Evaluation, Authorization, and Restriction of Chemical Industries is a European community regulation on the safe use of chemicals which took effect in 2007. REACH concentrates on identifying the nature of chemical substances at an early juncture. It also addresses the dissemination of information about the composition and hazardous nature of the chemicals.[64] The regulations make the industry responsible for managing risks from chemicals, and emphasize the provision of safety information on the substances.[65]

REACH treats both "existing" and "new" substances at par. The substances are categorized into non-phase-in substances[66] and phase-in substances.[67] However, REACH makes several exceptions for radioactive substances and waste.[68] The member states are empowered to make additional exemptions.[69]

I. JAPAN

Japan enacted the Appliance Recycling Law in 2001, which provides for a retailer take-back policy for certain electronic products.[70] The law, however, only addresses a small range of products and its recycling goals are

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[62] *Id.* art. 8.

[63] *Id.* art. 16. The provision clearly outlines the functions of the Secretariat. *See also id.* arts. 3, 5, 6, 8, 11, 13, 19 & Annexure V.

[64] *See* European Commission Environment Directorate General, *REACH in Brief*, paras. 2.3, 2.4, 2.5, 2.11, http://ec.europa.eu/environment/chemicals/reach/pdf/2007_02_reach_in_brief.pdf (last visited Jan. 24, 2009).

[65] *See id.* paras. 2.4, 2.5, 2.11, 5.1. *See generally id.* para. 2.

[66] The term refers to those substances not produced or marketed prior to the entry into force of REACH. *Id.* para. 2.

[67] The term refers to those substances listed in the European Inventory of Existing Chemical Substances, or those that have been manufactured in the European Community, but not placed on the Community market, in the last 15 years or the so-called "no longer polymers" of the EU Directive 67/548. *Id.*

[68] *Id.*

[69] *Id.*

[70] *See* AUSTL. GOV'T: DEP'T OF ENV'T, WATER, HERITAGE & ARTS, ELECTRICAL AND ELECTRONIC PRODUCTS INFRASTRUCTURE FACILITATION, http://www.environment.gov.au/settlements/publications/waste/electricals/infrastructure/international.html (last visited Jan. 24, 2009).

modest.[71] Secondly, the recycling law does not specify material restrictions to promote environmentally-friendly designs of appliances.[72]

Japan also enacted the Pollution Release and Transfer Registry (PRTR) to facilitate disclosure of chemical use in production.[73]

J. UNITED STATES

No federal law deals exclusively with the problem of e-waste. Several states, however, have enacted legislation to deal with e-waste. California and Massachusetts, for example, have banned dumping cathode ray tube monitors and televisions in landfills because of the lead content in the glass.[74] Washington, California, Maine and Maryland are the only four states that have passed e-waste recycling laws so far.[75] Several other states and municipalities, however, have legislations in the pipeline.[76]

K. CONCLUSION

The efficacy of these international endeavors is open to debate. Incidents like the Nigeria-Italy Trade Case[77] underline the flaws of the present regime. However, it cannot be denied that the endeavors have been successful to the extent of creating an international consciousness regarding the surmounting problem of e-waste, which may culminate in the adoption of stronger and binding measures.

II. ANALYSIS OF E-WASTE MEASURES

A. ANALYSIS OF CHINA ROHS

In response to concerns about the ever-growing tide of electronic waste,

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[71] *See* INFORMINC.ORG, ELECTRIC APPLIANCE RECYCLING IN JAPAN, http://www.infor minc.org/japanepr.pdf (last visited Jan. 24, 2009).

[72] *Id.*

[73] *See* N. N. Sachitanand, *The Ugly Face of IT*, HINDU, June 23, 2003, *available at* http://www.hinduonnet.com/thehindu/biz/2003/06/23/stories/2003062300070200.htm.

[74] *Id.*

[75] *See* E-waste and Recycling Laws, Silicon Valley Toxic Coalition, http://www.etoxics.org/site/PageServer?pagename=svtc_ewaste_and_recycling_policy (last visited Jan. 24, 2009).

[76] Massachusetts, Nebraska, New Hampshire, New Jersey, New York State, Vermont, Washington State, Wisconsin and New York City have drafted legislations awaiting enactment. *Id.*

[77] *See* Poropot & Ibrahim *supra* note 14.

the Chinese government enacted China RoHS.[78] This legislation was adopted on February 28, 2006 and took effect on March 1, 2007. The provisions are to be implemented in two phases. The first phase, brought into effect on March 1, 2007, consists of labeling and information disclosure mandates. The second phase involves the preparation of a catalogue of substance restrictions and associated pre-market compliance certification and has not yet been implemented.

The legislation embraces the production, sale, and import of "electronic information products" within the territory of the People's Republic of China. However, an exception has been carved out in favor of the production of the exported products. The term used in the legislation to refer to what we broadly understand as "Electronic and Electrical products," is "Electronic Information Products" defined under Article 3(1) as:

> Electronic information products refers to electronic radar products, electronic communication products, broadcast and television products, computer products, household electronic products, electronic measuring instrument products, specialized electronic products, electronic components and parts, electronic application products, electronic materials, and other relative products and their accessory parts.

Clearly the terms 'relative products' and 'accessory products' provide a much wider scope to the China RoHS as compared to that of the EU RoHS. To clarify the meaning of Electronic Information Production, the Ministry of Information Industry issued "Electronic Information Products Classification and Explanations" on March 16, 2006, which was comprised of a non-exhaustive list of approximately 1,800 products, components and materials.[79]

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[78] Since there is no official English translation of the enactment, and unofficial translations use varying terms, we have referred to the enactment by its popular name, the China RoHS, here. *Compare* Administration on the Control of Pollution Caused by Electronic Information Products, http://www.chinarohs.com/docs.html (last visited Jan. 24, 2009) (unofficial translation), *with* Administrative Measures on the Control of Pollution Caused by Electronic Information Products, http://www.capella.co.nz/sites/rohs-international.com/files/translation-of-china-rohs.pdf (last visited Jan. 24, 2009) (MII translation), Management Methods for Controlling Pollution by Electronic Information Products, http://www.aeanet.org/governmentaffairs/gabl_ChinaRoHS_FINAL_March2006.asp (last visited Jan. 24, 2009) (AeA translation), *and* Measures for Administration of the Pollution Control of Electronic Information Products, http://english.mofcom.gov.cn/aarticle/policyrelease/domesticpolicy/200605/20060502132549.html (last visited Jan. 24, 2009) (Ministry of Commerce of PRC translation). All references to China RoHS are based on this last translation provided by the Ministry of Commerce.

[79] *See* Electronic Information Products Classification and Explanations, http://www.aeanet.org/GovernmentAffairs /gabl_HK_Art3_EIPTranslation.asp (last visited

Instead of referring to as "Electronic and Electrical Waste" or "hazardous substances," China RoHS refers to the waste as "Pollution caused by electronic information products" and defines it under Article 3 (2) as:

> Pollution caused by electronic information products refers to electronic information products containing toxic, harmful substances or elements, or the toxic, harmful substances or elements contained in the electronic information products is above the standard of the state or industry and have caused damage, injury, waste or other harmful effects on the environment, resource, human health and property safety.

These words, read in conjunction with the definition of "toxic or harmful substances or elements" provided in Art. 3(3)(4)[80] suggest that the focus of the enactment is prevention of pollution rather than e-waste management or hazardous substance management. Moreover, the State may make additions to the list provided in the definition.

China RoHS deals with various aspects of design and production processes,[81] information disclosure requirements,[82] monitoring of purchase channels and rejection of non-conforming goods,[83] and the prohibition of electronic information product imports, which fail to meet the standard of the state or industry.[84] The legislation promotes awareness amongst the people, and encourages cooperation between the government, people,[85] and

Jan. 24, 2009).

[80] *See* China RoHS, Ministry of Commerce of PRC translation, *supra* note 78, art. 3(3)(4) (providing that 'Toxic or harmful substances or elements' refers to following substances or elements contained in the electronic information products:
1. Lead
2. Mercury
3. Cadmium
4. Hexavalent Chromium
5. Polybrominated Biphenyls (PBB)
6. Polybrominated Diphenyl Ethers (PBDE)
7. Other toxic or harmful substances or elements prescribed by the State).

[81] *See id.* arts. 3(3)(1), 3(3)(2).

[82] During the process of design, production, sale and import, indicate the names and the contents of toxic or harmful substances or elements, and indicate the environment-friendly use period of electronic information products. See *id.* art. 3(3)(2).

[83] *Id.* art. 3(3)(3).

[84] *Id.* art. 3(3)(4).

[85] *See, e.g.*, MII may provide support to the organizations and individuals actively involved in the research and development of new types of environment-friendly electronic information products. *Id.* art. 6. The government may reward the organizations and individuals with outstanding achievements in their work and relevant activities on the pollution control of electronic information products. *Id.* art. 8. Any organization or individual may

the industry.[86] China RoHS encourages greater corporate responsibility on the part of the industrialists and educates the consumer, thereby making protection of the environment the solemn duty of every individual. Penal provisions reinforce this message.[87]

The legislation, nevertheless, suffers from serious lacunae. First, China RoHS lays down broad measures for controlling pollution from electronic information products.[88] In that regard, it overlooks the necessity for legislation specifically addressing the issue of e-waste.

Second, many governmental departments have been assigned the task of ensuring compliance with the provisions of the enactment.[89] This can lead to red tape, corruption, inefficiency, confusion as to powers, duties and jurisdiction, and unaccountability. It is suggested that a single specialized department can more effectively implement China RoHS mandates.

Third, the exemption for exports is unfair and should be removed. Domestic goods, imports, and exports should all be treated equally. Fourth, Article 11 empowers the manufacturer or importer to determine the environment-friendly use period of electronic information products. A more objective approach would include testing and monitoring by some governmental agency.

Fifth, China RoHS discusses consultation processes[90] but does not specify whether such consultation is binding or how an opinion is to be

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inform against a designer, producer, importer, or seller causing pollution of electronic information products to the MII or the competent administration. *Id.* art. 25.

[86] *Id.* art. 11. It provides that the environment-friendly use period of electronic information products is to be determined by the manufacturer or importer. Further, the industrial organizations are given the liberty to put forward guiding ideas on the environment-friendly use period of electronic information products according to the status of technological development.

[87] *Id.* art. 22.

[88] "These measures are formulated in accordance with Cleaner Production Promotion Law of the People's Republic of China and Law of the People's Republic of China for Preventing and Remedying Pollution Caused by Solid Wastes and other relative laws and administrative rules." *Id* art. 1. Further, the repetitive use of the phrase "within the scope of their official duty" shows that no new powers have been conferred, nor have new duties been assigned. The former system has therefore remained more or less intact. *See id*. arts. 5, 7.

[89] "The Ministry of Information Industry of the People's Republic of China (MII), the National Development and Reform Commission (NDRC), the Ministry of Commerce of the People's Republic of China (MOC), the General Administration of Customs of the People's Republic of China (GAC), the State Administration for Industry & Commerce (SAIC), the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ), and the State Environmental Protection Administration of China (SEPA) shall administer and supervise the pollution control of electronic information products within the scope of their official duty." *Id* art. 4; *see also id.* arts. 5, 7, 26.

[90] The process of 'consultation' has been mentioned several times in China RoHS. *Id.* arts. 5, 11, 13, 14, 17, 18, 21 & 26.

formed – whether based on majority or unanimity, whether some members have a veto power, and the like. The provisions are vague, incomplete, and are likely to cause practical problems.

Lastly, not only is the Ministry of Information Industry entrusted with the duty to draw up standards in furtherance of these measures,[91] it is also empowered to interpret the measures.[92] This amounts to empowering it with both legislative and judicial powers, effectively making it a judge of its own case, in violation of the principles of natural justice *(Nemo judex in causa sua).*

China RoHS is doubtless a good beginning in the direction of e-waste control legislation. However, the nascent body of law may not be able to adequately handle the challenge.

B. ANALYSIS OF INDIAN DIRECTIVES

In India, no legislation specifically addresses the problem of electronic waste. Presently, some provisions of The Hazardous Waste (Management and Handling) Rules,[93] and The Municipal Solid Wastes (Management and Handling Rules), 2000,[94] apply to electronic waste. India drafted a WEEE Bill in 2006, but no further action has been taken in this regard.

The Hazardous Waste Rules do not define electronic waste. The rules define Hazardous Waste[95] as "any waste which by reason of its physical, chemical, reactive, toxic, flammable, explosive, or corrosive characteristics causes danger or is likely to cause danger to health or environment, whether alone or when on contact with other waste or substances." The Rules incorporate three schedules, and electronic waste includes:

> (a) wastes listed in column (3) of Schedule-1;
>
> (b) wastes having constituents listed in Schedule-2 if their concentration is equal to or more than the limit indicated in the said Schedule; and
>
> (c) wastes listed in Lists 'A' and 'B' of Schedule-3 (Part-A) applicable only in case(s) of import or export of hazardous wastes in accordance with rules 12, 13 and 14 if they possess

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[91] *Id.* art. 17.

[92] *Id.* art. 26.

[93] The Hazardous Waste (Management and Handling) Rules (1989), http://envfor.nic.in/divisions/hsmd/notif.html (last visited Jan. 24, 2009) [hereafter Hazardous Waste Rules].

[94] The Municipal Solid Wastes (Management and Handling Rules) (2000), http://envfor.nic.in/legis/hsm/mswmhr.html (last visited Jan. 24, 2009) [hereafter Municipal Solid Wastes Rules].

[95] Hazardous Waste Rules, *supra* note 93, at Rule 3(xiv).

> any of the hazardous characteristics listed in Part-B of Schedule 3.

In sum, the Hazardous Waste Rules specify that all wastes mentioned in column (3) of Schedule-1 are hazardous wastes irrespective of concentration limits given in Schedule-2 except as otherwise indicated. Schedule-2 is applicable only for wastes or waste constituents not covered under column (3) of Schedule-1. Schedule-3 is applicable only in the case of import or export.

The Municipal Solid Wastes Rules, the other relevant directive, covers commercial and residential wastes generated in municipal or notified areas in either solid or semi-solid form, excluding industrial hazardous wastes, but including treated bio-medical wastes.[96] Neither The Hazardous Waste Rules nor the Municipal Solid Wastes Rules directly address electronic waste.

C. Inadequacy of Blanket Regulations

The Hazardous Waste Rules and the Municipal and Solid Waste Rules are both generic directives, and do not provide any specific regulations regarding e-waste.

Being blanket laws, these directives inadequately define e-waste. Presently, no legislation specifically addresses the mounting problem of e-waste. In the absence of a precise definition of e-waste, the existing Directives address the problem only in a very broad and vague manner. For example, Schedule 1 would cover under its ambit electronic waste that is the result of secondary production of copper and zinc, incineration, separation and concentration processes, but would not cover other types of e-waste such as electric bulbs. Moreover, with the growth in technology, it is likely that new production methods not covered in the Schedules will be invented. The Directives overlook this possibility.

The EU WEEE defines electric and electronic equipment waste as "Electrical or electronic equipment which is waste... including all components, sub-assemblies and consumables, which are part of the product at the time of discarding."[97] WEEE defines "Waste" as "Any substance or object which the holder disposes of or is required to dispose of pursuant to the provisions of national law in force."[98] The Council of European Communities defines "waste" as:

> Electrical and Electronic Equipment' or 'EEE' means equipment which is dependent on electrical currents or electromagnetic

[96] Hazardous Waste Rules, *supra* note 93, at Rule 3(xv).

[97] WEEE Directive, *supra* note 40, at art. 3(b).

[98] Council Directives 75/442/EEC of 15 July 1975 on Waste, art. 1(a), *available at* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31975L0442:EN:HTML.

> fields in order to work properly and equipment for the generation, transfer and measurement of such current and fields falling under the categories set out in Annex IA to Directive 2002/96/EC (WEEE) and designed for use with a voltage rating not exceeding 1000 volts for alternating current and 1500 volts for direct current.[99]

The Organization for Economic Co-operation and Development (OECD) defines e-waste as "any appliance using an electric power supply that has reached its end-of-life."[100]

From these definitions, it is clear that while discussing the concept of e-waste, it is essential to take into consideration the electronic nature of the substance, and the meaning of "waste."

The Guidelines for Environmentally Sound Management of E-waste proposes three drivers, aspects that should be included in a comprehensive definition:[101]

1. Definition of "electrical and electrical equipment."
2. Description of its loss of utility.
3. Way of disposal.

The second factor, loss of utility, is expressed in terms such as "end of life"[102] and "disposal"[103] in various definitions. However, in many definitions these terms do not take into account products which, nearing the end of life, are dumped on developing countries under the garb of "donations"[104] or secondhand goods, a phenomenon which may be called "disguised dumping."

It is suggested that developing countries should describe loss of utility as relating to products that are "near" as well as "at the end of their useful life," which makes for a broader and a more comprehensive definition of e-waste.

In addition, it is difficult to see why "way of disposal" is an essential component of a definition of e-waste. It is submitted that a comprehensive

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[99] WEEE Directive, *supra* note 40, at art. 3(a).

[100] OECD, *Extended Producer Responsibility: A Guidance Manual for Governments*, Paris (2001).

[101] MINISTRY ENV'T & FORESTS AND CENTRAL POLLUTION CONTROL BD., GUIDELINES FOR ENVIRONMENTALLY SOUND MANAGEMENT OF E-WASTE (2008), http://www.cpcb.nic.in/e_Waste.php.

[102] WEEE Definition of E-waste, *supra* note 97.

[103] Council of European Communities Definition of Waste, *supra* note 98.

[104] For example, the Indian embassy in the U.S. encourages donations of old PCs to government-run schools and other economically challenged institutions. *See* India, the E-waste Land (May 17, 2006), *available at* http://www.physorg.com/news67098899.html.

definition should be framed blending the first two of the drivers.

D. Implementation of the Law

There is no regulatory body to see to the effective implementation of the law. No punitive or deterrent methods for non-observance of the Rules are prescribed.

E. Distinction drawn between various types of goods

The Hazardous Waste Rules classifies waste substances into three categories:

1. Waste substances generated in India, and exported.
2. Waste substances generated abroad, and imported.
3. Waste substances generated and retained in India.

This classification creates a distinction between the first and second categories, as against the third.[105] It is difficult to understand why the rules apply to the first two categories, but not the third, when waste substances from all three categories lead to the same damage. Given the fact that developing nations are fast becoming major producers and consumers of electrical goods,[106] to make such a distinction is to defeat the purpose of the law.

III. SUGGESTIONS:

A. Establishment of regional regulatory bodies

The problem of e-waste invites a concerted effort from the international community. The formation of regional organizations by countries sharing common interests would be useful in this regard. The Bamako Convention is a case-in-point. Such organizations could lay down uniform standards to

[105] The definition of electronic waste in The Hazardous Waste Rules includes "wastes listed in Lists 'A' and 'B' of Schedule-3 (Part-A) applicable only in case(s) of import or export of hazardous wastes in accordance with rules 12, 13 and 14 if they possess any of the hazardous characteristics listed in Part-B of Schedule-3." Hazardous Waste Rules, *supra* note 93, at Rule 3(xiv)(c).

[106] The electronics market in India was pegged at U.S. $15 billion in 2006-2007. The market is expected to grow at a CAGR (Compound Annual Growth Rate) of 44% by 2010. *See* INV. COMM'N OF INDIA, ELECTRONICS HARDWARE (2008), http://www.investment commission.in/electronic_hardware.htm; *see also The Technology Industry*, ECONOMIST, Oct. 5, 2006, *available at* http://www.economist.com/business/displaystory.cfm?story_id=8001756.

be observed by the members, monitor the progress made, assess the degree of compliance, review the laws being enacted in furtherance of the scheme, and strengthen the voice of the weaker nations. A two-tier system, whereby a regulatory body is established in each member country as well as at the regional level, is recommended.

At present, different countries attack e-waste problems with their disparate laws. A regional system would create one comprehensive law for specific regions, and mitigate the existing confusion caused by the motley of laws.

B. Creating Awareness

The people of a developing country should work hand-in-hand with the government to spread awareness about the dangers of e-waste dumping. The provisions made by the China RoHS in this respect may serve as a blueprint,[107] and encourage active civic participation. Student and NGO participation may also help.

C. Fines and Compensation

A scheme for fines and compensations discourage flouting of the laws. However, the question would arise as to whether the company, or the country where the company is based, should pay the fines. It is submitted that the companies should pay the fine and compensate those adversely affected by e-waste. It is also put forth that the government, in furtherance of the international scheme of environmental protection, should assume the ethical and legal responsibilities to pay compensation, and provide technical aid to the government of the affected country to mitigate the environmental harm caused.

A more forceful initiative, one that would send a clear message about the intention of the developing countries to arrive at a solution to the hazardous waste problem, would be to affix criminal liability on violators of environmental laws. In 1998, the Council of Europe (CoE) announced the Convention on the Protection of the Environment through Criminal Law,[108] which is open to signature. The Convention addresses corporate and individual liability.[109]

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[107] *See* China RoHS, *supra* note 78, arts. 8, 25.

[108] Convention on the Protection of the Environment through Criminal Law, Council of Europe (Nov. 1998) No. 172.

[109] *Id.* art. 9.

D. Labeling of products

Products should clearly be specified as e-waste, and a warnings should be included that unambiguously spells out the dangers of the electronic product.

E. Costs

The problem of who should bear the costs for the recycling process must be addressed. Many nations follow either cost-apportionment scheme – the Advance Recovery Fee (ARF) or Extended Producer Responsibility (EPR) scheme.

In ARF systems, the government collects deposits from consumers who have purchased an electronic item. These funds are redistributed through grants to public and private entities that recycle electronics. Thus, this scheme shifts the financial burden away from producers. While it is true that such a system is simple, the burden may frequently fall upon the taxpayer if the funds collected are not sufficient to cover the costs.[110]

On the other hand, EPR, or the principle of "Polluter Pays," is based on the idea that the producer must assume responsibility of the environmental consequences of its products. The financial burden would fall upon the manufacturer and not upon the retailers or customers.[111]

The principle of "Polluter Pays"[112] is one long established in environmental law. Shifting costs would encourage manufacturers to produce the most environmentally friendly products possible. Developing nations might do well to follow suit.

CONCLUSION

Developing countries are today at their most vulnerable, crippled by their inherent problems of lack of awareness, poverty and legal laxity.

We have considered China and India as being illustrative of the state of affairs. China is the first Asian country to have adopted an e-waste law regime of the order of the EU RoHS. In India, though the Guidelines for

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[110] Kurtz, *supra* note 3.

[111] *See generally* Catherine K. Lin et al., *Globalization, Extended Producer Responsibility and the Problem of Discarded Computers in China: An Exploratory Proposal for Environmental Protection*, 14 GEO. INT'L ENVTL. L. REV. 525, 527 (2002).

[112] The principle of "Polluter Pays", places on the polluter the obligation to undo the harm caused, irrespective of whether there was or not fault on his part. The core of the polluter pays principle argues that neither the government nor society-at-large should subsidize pollution and polluters and that polluters should internalize the costs of pollution abatement. *See generally* Jonathan Remy Nash, *Too Much Market? Conflict between Tradable Pollution Allowances and "Polluter Pays" Principle*, 24 HARV. ENVTL. L. REV. 465 (2000).

Environmentally Sound Management of e-waste have were in 2008, the WEEE Bill of 2006 still remains in the pipeline. In both the countries, little has been achieved towards better law enforcement. The conditions in these two leading Asian countries reflect the state of affairs in developing countries.

An indifferent government, coupled with an ignorant people, form a fatal combination. Even where the government is active, the policies either remain on the statute books or are too toothless to make a difference. Moreover, a corruption-ridden administration makes it difficult to achieve the protection envisioned by the law. To add to this is their inescapable economic dependence on developed counties, only resulting in their increased vulnerability. In sum, these countries that are less visible to the international community, with hardly audible voices, have little choice between the devil and the deep blue sea. It is time for concerted efforts to face the ever-increasing problem of e-waste by developing a new regime of international law on the subject.