

# The International Tribunal for E-waste: Ending the Race Towards Lethal Fallout

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*Creating Forums for E-waste Claims that Serve as an Interim Monetary Solution to Human Rights Violations Caused by E-Waste Black Markets.*

*In today's high-tech era, the temptation for upgrades is everywhere: a slimmer cell phone, a sleeker desktop, a sportier BlackBerry. But the consequences of the constant quest for better gadgetry are piling up.*

- Reporter Juliet Eilperin<sup>1</sup>

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1. Juliet Eilperin, *Dead Electronics Going to Waste: Millions of Tons of Used Devices Pose Threat to Environment*, WASHINGTON POST, Jan. 21, 2005, at A04.

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## I. INTRODUCTION

Steadily, several developing nations, including China, India, Ghana, and Nigeria, compete in the world's largest "race to the bottom."<sup>2</sup> But, which nation will victoriously emerge next as the world's largest site for electronic waste dumping? More importantly, this article will assess how these developing nations entered into this toxic and deadly horserace.

This article will explore the pathways and struggles to a successful international e-waste suit by explaining the origins of e-waste and how e-waste became the fastest growing solid-waste stream within Western Africa; discussing both the environmental and human impact that the United States and European Union have had in West Africa's port cities of Accra, Ghana, and Lagos, Nigeria; introducing important international measures that have failed or even perpetuated the creation of the e-waste black market; discussing why international litigation with a monetary component would effectively serve, as an interim measure, to relieve the physical harm done to slum dwellers as well as assist the interests of developing nations in proper e-waste management; and detailing the difficulties in having international litigation for environmental damage to humans.

Born from the Information Era and Digital Age's boom in consumption patterns, electronic waste remains as the environmental fallout caused by "digitally-addicted," hyper, first-world consumers, primarily in the United States and the European Union.<sup>3</sup> Within the United States, one sees hyper and "digitally-addicted" consumers everywhere. One only needs to turn around to find someone checking a FuelBand<sup>TM</sup>; fidgeting with an iPhone, Blackberry, or other mobile device; clicking away on a laptop under the dim lighting in a Starbucks; and scrolling through a book on an e-reader. These habits have all become deeply engrained into Americans' daily lives and consumers have become dependent on the next "new thing" that Information Technology (IT) industries push.

Consumers' addiction to upgrading serves as a prime example of how "digitally-addicted" consumers greatly harm the environment.<sup>4</sup> As described by Eilperin, "the temptations for upgrades are everywhere: a slimmer cellphone, a sleeker desktop, [and] a sportier Blackberry."<sup>5</sup> After every technological advancement, first-world consumers flock to the

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2. Saraswathi Muniappan, *India's capital emerging as world's largest E-waste dumping ground*, PHILIPPINES NEWS AGENCY, Aug. 30, 2013, available at LexisNexis Advance.

3. See Eilperin, *supra* note 1.

4. *Id.*

5. *Id.*

equivalent of our Apple Stores, Microsoft stores, and Wal-Mart outlets alike to pick up a copy of the next new, mass-produced item. Consumers want their “tech high.”<sup>6</sup> Better yet, these savvy consumers always have options—whether to throw out the phone they bought two or three months ago for the same model that is upgraded with new color options including gold, electric blue, and bubblegum pink! Frequently, “digitally-addicted consumers” satiate their desires for more advanced technology—at the expense of third world countries—by throwing out their “old,” “obsolete” electronics.

Electronic waste (e-waste) abounds when consumers throw out their old electronic products for new products. Scholars and reporters define e-waste as obsolete electronics or electronics that reach the end-of-life cycle.<sup>7</sup> E-waste includes cathode ray tube (CRT) televisions; desktops; laptops; CRT and liquid crystal display (LCD) monitors; cellphones; Kindles, iPads, e-readers, and touchscreen monitors of all sorts; keyboards; computer mice; and printers, copiers, and fax machines.<sup>8</sup> Although most academicians primarily look at Information Technology (IT) equipment as a source for e-waste, others include large household items, such as refrigerators and air conditioners,<sup>9</sup> within the fastest growing solid-waste market.

Regardless of e-waste’s parameters, each micro-improvement or aesthetic change to electronic products has resulted in mass rates of obsolescence for the electronic products that came before. Recycling and waste management facilities in developed nations have been unable to keep up with rapid turnover rates in a product’s lifecycle. Because developed nations cannot maintain turnover rates for electronics, nor develop waste management facilities to properly handle the surplus in obsolete products, these nations turn to developing nations for relief.

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6. *Delhi-NCR becoming e-waste dumping yard!*, MERINEWS, Aug. 29, 2013, <http://www.merineews.com/article/delhi-ncr-becoming-e-waste-dumping-yard/15889616.shtml>.

Notably, mobile handset device consumption and personal computer consumption has increased both in the developed and developing world due to more affordability. Phoenix Pak, *Haste Makes E-Waste: A Comparative Analysis of How the United States Should Approach the Growing E-Waste Threat*, 16 CARDOZO J. INT’L & COMP. L. 241 (2008) (stating that consumer flocking increases the rate of obsolescence and replacement).

7. Jason Lewis, *E-Cemeteries: Where Electronic Waste Never Dies*, 13 PUB. INT. L. REP. 177 (2008).

8. Aimin Chen, et. al., *Developmental Neurotoxicants in E-waste: An Emerging Health Concern*, 119 ENVIRONMENTAL HEALTH PERSPECTIVES 4, 431 (2011), available at JSTOR, <http://www.jstor.org/stable/41203250>.

9. Siddharth Prakash, et al., *Socio-economic assessment and feasibility study on sustainable e-waste management in Ghana*, OKO-INSTITUT E.V. (2010), <http://www.oeko.de/oekodoc/1057/2010-105-en.pdf>.

The United States and the European Union continue to use developing nations, especially those in West Africa, as a dump for their nations' used electronics. In return, developing nations sort through portions of the e-waste and depend on e-waste as a source of job stability for poor laborers: “[R]ich in valuable materials for recovery and recycling, [e-waste] creates the perfect conditions for a toxic economy in which poor countries labor through exposure to carcinogenic, mutagenic, reproductive, and developmental toxins in the name of making a living.”<sup>10</sup>

E-waste comprises a significant amount of recyclable, valuable components as well as up to sixty different elements from the periodic table that, in certain combinations, will have lethal effects on humans, animals, and soil.<sup>11</sup> For example, flat screen televisions contain valuable metals, such as gold, copper, silver, aluminum, zinc, iron, nickel, and tin in trace amounts; however, these televisions also contain mercury, which impairs the nervous system and kidney functions of those that come in contact with it.<sup>12</sup> Cell phone devices contain at least forty elements of the periodic table—including lead, arsenic, cadmium, chromium, and mercury—within their plastic casings; when poor laborers disassemble these products by cracking them open, it allows carcinogenic dioxins and poly-aromatic hydrocarbons to spew into the air.<sup>13</sup> Essentially, once consumers dump their e-waste, directly or indirectly, into the international market and their waste reaches a developing nation, consumers unleash a ticking time bomb of toxicity on that developing nation, especially on the women and children laborers that scavenge or mine for it.

The practice of “harvest[ing] precious metals from end-of-life electronics as well as reus[ing] junk electronics” has been riddled with peril for poor laborers and the surrounding environment due to “primitive” e-waste management facilities and procedures.<sup>14</sup> While methods of “recycling” and “scavenging” vary from Asia to West Africa, in areas where e-waste volumes have severely risen, young boys must tend to open fires, cook circuit boards, and melt down cables, which releases valuable

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10. Gopal Dayaneni & Aaron Shuman, *Toxic Sentence: Captive Labor and Electronic Waste*, 14 RACE, POVERTY & THE ENVIRONMENT 1, 45 (2007), [http://www.urbanhabitat.org/files/RPE14-1\\_Dayaneni-Shuman-s.pdf](http://www.urbanhabitat.org/files/RPE14-1_Dayaneni-Shuman-s.pdf).

11. Jen Fela, *Developing countries face e-waste crisis*, 8 FRONTIERS IN ECOLOGY AND THE ENVIRONMENT 3, 117 (2010).

12. *Id.*

13. See Chen, *supra* note 8, at 432; Charles Schmidt, *Unfair Trade e-Waste in Africa*, 114 ENVIRONMENTAL HEALTH PERSPECTIVES 4, A 233 (2006); *Electronic Waste: Need for Comprehensive Solutions*, 41 ECONOMIC AND POLITICAL WEEKLY 2400 (2006).

14. See Lewis, *supra* note 7; Xia Huo, et. al., *Elevated Blood Lead Levels of Children in Guiyu, an Electronic Waste Recycling Town in China*, 115 ENVIRONMENTAL HEALTH PERSPECTIVES 7 (2007).

electronic components like diodes, resistors, and microchips.<sup>15</sup> Children use any means necessary to dismantle old electronics, even smashing them with a rock; only fortunate children have electric drills, cutters, hammers, and screwdrivers to aid in the process.<sup>16</sup> Women submerge electronics in acid baths to extract precious metals, like gold and palladium; young girls participate in the daily struggle to collect e-waste by selling water to the laborers.<sup>17</sup> Once workers have extracted trace elements from e-waste, they discharge the remaining acid into nearby fields or streams because they have nowhere else to dispose of it.<sup>18</sup>

Although several international treaties and conventions have banned the exportation of e-waste into developing nations, developed nations continue to dump due to its cost-effectiveness. However, the cost of promoting and perpetuating poor waste management facilities, even if not in one's own territory, will have dire consequences on the world's water supplies and future agriculture when these chemicals oversaturate and contaminate the soil.

E-waste management requires proper facilities that can handle the hyper consumption of its consumers. Herein lies the problem: consumers value innovative products more than they value the development of healthy disposal methods of their old products. Those that manage e-waste in developed countries have never been able to act efficiently, placing minimal resources into efficiency because these countries find it more convenient and less expensive to just export the e-waste overseas. The inefficiency of ignoring hyper-consumerism will soon take a harsh and irreversible toll on the environment, leaving both developed<sup>19</sup> and developing countries to suffer in the toxic wasteland once known as Earth.

Addressing e-waste pollution requires developed nations to take responsibility for their actions. Nations need to apply a broader understanding of the "polluter pays" principle to nations as a whole because nations permit the commerce of e-waste from producers into their

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15. See generally, Schmidt, *supra* note 13; See Huo, *supra* note 14; Naomi Lubick, *International Environmental Health: Shifting Mountains of Electronic Waste*, 120 ENVIRONMENTAL HEALTH PERSPECTIVES, 4, A 148 (2012).

16. See Huo, *supra* note 14.

17. See Lubick, *supra* note 15; see Schmidt *supra* note 13; see Huo *supra* note 14.

18. See generally Huo, *supra* note 14.

19. Sarah Fehm, *From iPod to e-Waste: Building a Successful Framework for Extended Producer Responsibility in the United States*, 41 PUB. CONT. L.J. 173 (2011). This Rio principle, supported by the Organization for Economic Cooperation and Development (OECD) and the European Communities (EC), ensures that parties responsible for pollution pay for its damages done to the natural environment. This has primarily been used for producers of these products, not nations.

jurisdictions.<sup>20</sup> For e-waste, industrialized nations should be held responsible for the environmental damage and human rights violations caused from their nations' mass e-waste, regardless of whether exports come from private parties within the nation state or directly from the government. Furthermore, these industrialized nations should pay monetary compensation for systematically causing human rights violations and extreme environmental damage to developing nations via the export of hazardous e-waste. For monetary compensation to occur, international litigation in an International Tribunal for E-waste claims must be a common and effective interim means that developing nations employ to address the existence of the e-waste black market; the immediate hazards to poor laborer's working conditions, health, and pay; and the need for more permanent e-waste management systems.

Currently, international litigation with monetary compensation in this arena has not occurred, leaving questions about the proper way to succeed in a potential future claim. In particular, the unique nature of e-waste requires us to establish an international tribunal to handle these particular claims. Ideally, international litigation with monetary compensation would recognize that waste exists as its own black market that undercuts the effectiveness of current international anti-dumping measures, regulations, and conventions. International litigation would also acknowledge that e-waste's black market complicates the likely success of a co-beneficial complete ban on e-waste exports, and international litigation would create a source of income for long-term e-waste disposal solutions that include updated recycling facilities in both industrialized nations and developing nations. Further, international litigation would provide an interim cash flow to immediately start building better waste management facilities in developing nations; would refocus the e-waste black market to support decent wages and safety equipment for laborers; and would address the health needs of those who have physically suffered due to polluted food, water, and soil.

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20. Gary Ginsberg, *Is Our Toxic Electronic Waste Ending Up in Kids' Jewelry?*, THE DR. OZ SHOW (Jan. 15, 2010), <http://www.doctoroz.com/blog/gary-ginsberg-phd/our-toxic-electronic-waste-ending-kids-jewelry>. Developed nations like the United States ironically pay for e-waste to re-enter their country in new forms, such as toxic toy metal jewelry, which has been known to be harmful to children. Toxic metal jewelry can have a lethal effect on children and severely harm the individuals in developed nations. The momentary monetary gain from exporting e-waste does not outweigh the harms that recycle back on to American consumers.

## II. TRASH RECEPTACLE: E-WASTE DUMPING GROUNDS IN GHANA AND NIGERIA

### *A. How E-waste Developed in West Africa*

The story of e-waste within Western Africa has been an extension of the history of colonialism and its progressive fallout after World War II. Some argue that the history of e-waste really represents an extension of colonialist practices after colonial powers de-stabilized their former colonies by financially pulling out of these areas, stating “developed nations exert political and legal domination over the developing nations as a source of exerting the needs of the former colonizer.”<sup>21</sup> Given that developed nations primarily use areas like Western Africa for dumping because it places fewer expenses on the developed nations, these are reasonable interpretations.

Other scholars discuss the origins of e-waste into West Africa as a further extension and effect of the “digital divide” when Africa became “hungry for information technology” but had a limited capacity to manufacture it.<sup>22</sup> While Africa sought to bridge the digital divide, developed countries sought solutions to tighter environmental regulations at home, which made it costly, but imperative, to recycle.<sup>23</sup> The European Union and the United States stepped in by providing “donations” to these areas. Due to tighter regulations on import methods of recycling e-waste in Asian countries, another large region for e-waste dumping, African nations became a premiere location for new dumping.<sup>24</sup> While African nations accepted these “donations” with the hopes of bridging the digital divide, developed nations exploited African nations by allowing brokers to pad the shipping containers with additional junk, saddling African importers with developed nations’ electronic garbage.<sup>25</sup> African countries will continue to receive higher importation volumes because of “shadow markets emerging from international and domestic recycling loopholes” in more developed countries.<sup>26</sup>

Tons of e-waste materials have been dumped in workshops, yards, roadsides, open fields, irrigation canals, riverbanks, ponds, and rivers

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21. Laura Pratt, *Decreasing Dirty Dumping? A Reevaluation of Toxic Waste Colonialism and the Global Management of Transboundary Hazardous Waste*, 35 WM. & MARY ENVTL. L. & POL’Y REV. 581 (2011).

22. See Schmidt, *supra* note 13, at A 234.

23. Zelalem Bogale, *Comment: E-Responsibility: E-Waste, International Law and Africa’s Growing Digital Wasteland*, 18.1 U.C. DAVIS J. INT’L L. & POL’Y 225, 239 (2011).

24. *Id.* at 228.

25. *Id.*

26. *Id.*



within West Africa. While developed nations continue to dump because of financial benefits to themselves, African nations continue to accept these shipments, contrary to international laws, because e-waste exists as a family business for the port villages' and towns' poor populations.<sup>27</sup> Furthermore, local laborers have been willing to accept these shipments because some containers possess items with a decent life expectancy that locals can resell in their own market. However, scavengers have their work cut out for them as they seek to mine for one piece of "treasure" in mountains of trash.<sup>28</sup>

### *B. Annual Dumping Worldwide and within West Africa*

Various reports estimate that the major e-waste contributors—United States, Western Europe, China, Japan, and Australia—produce twenty to fifty million tons of e-waste per year.<sup>29</sup> A 2012 study by the International Labour Organization (ILO) found that forty million tons of e-waste had been produced that year with an abysmal percentage—only thirteen percent—being recycled in proper facilities.<sup>30</sup>

The United States is the largest consumer and producer of e-waste exported into the developing world.<sup>31</sup> Around one hundred thousand computers become obsolete in the United States on a daily basis. Between 1997 and 2007, the United States had 500 million computers become obsolete and sent approximately eighty percent of these computers to Asia and Africa.<sup>32</sup> In 2007, the United States produced 2.5 million tons of e-waste, and such pollution has reportedly grown over the last five years.<sup>33</sup> In 2009, each U.S. household contained at least four small e-waste items and between two to three large e-waste items in storage.<sup>34</sup> These household items represent approximately 747 million e-waste items or

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27. See Huo, *supra* note 14, at 1113.

28. See Lubick, *supra* note 15, at A 148. UNEP's report, *Where are WEEE in Africa*, indicated that local users have not been the main source of e-waste within Africa; rather, illegal imports still make their way into West Africa. While mostly hazardous junk, these imports sometimes contain good quality electronics with a decent life expectancy.

29. Natalie Behring, *Inside the Digital Dump*, 160 FOREIGN POLICY 74 (2007); see Chen, *supra* note 8, at 431.

30. Barun Roy, *A dangerous wasteland*, BUSINESS STANDARD, Sept. 5, 2013, [http://www.business-standard.com/article/opinion/barun-roy-a-dangerous-wasteland-113090401146\\_1.html](http://www.business-standard.com/article/opinion/barun-roy-a-dangerous-wasteland-113090401146_1.html).

31. Oladele Ogunseitan, et al., *The Electronics Revolution: From E-Wonderland to E-Wasteland*, SCIENCE AND REGULATION: POLICYFORUM, 670 (Oct. 30, 2009), available at LexisNexis Advance, [http://www.lsi.usp.br/~acseabra/grad/2613\\_files/The%20Electronics%20Revolution-%20From%20E-Wonderland%20to%20E-Wasteland.pdf](http://www.lsi.usp.br/~acseabra/grad/2613_files/The%20Electronics%20Revolution-%20From%20E-Wonderland%20to%20E-Wasteland.pdf).

32. See Huo, *supra* note 14; see Dayaneni, *supra* note 10, at 45.

33. See Chen, *supra* note 8, at 431.

34. See Ogunseitan, *supra* note 31, at 670.

about 1.36 million metric tons yet to enter the black market.<sup>35</sup> Even smaller first-world populations like Australia contribute generously to e-waste. Australia throws away seventeen million televisions, computers, printers, and other electronic gadgets each year.<sup>36</sup>

Future predictions of e-waste volume levels look bleak. According to the United Nations Environment Programme (UNEP) report, the eleven developing countries mentioned within the report have all had sharp increases in e-waste volumes.<sup>37</sup> By 2018, more personal computers will be discarded in developing countries than in the developed world due to higher demands within developing nations. By 2020, waste from cell phones will increase eighteen fold from their 2007 levels, China will generate 200 to 400 percent more e-waste from old computers than in 2007, and India will produce five hundred percent more e-waste from old computers than in 2007.<sup>38</sup> By 2028, forty-four million televisions and computers will reach their end-of-life cycle.<sup>39</sup> Based on today's inadequate methods of managing e-waste, the report expects eighty-four percent of these obsolete products to wind up in the digital dumps.<sup>40</sup>

### *C. Deadly E-waste Areas in West Africa*

Within West Africa, e-waste yards have grown exponentially in the past few years; two major port cities have contributed to the spread of e-waste into new areas: Accra, Ghana, and Lagos, Nigeria. In particular, the more impoverished areas of these cities, which include smaller villages and neighboring towns, have been hosts to the world's dumping and serve as some of the largest landfills for e-waste. Due to these areas' high concentration of e-waste, Ikeja Computer Village near Lagos, Nigeria, and Agboghloshie near Accra, Ghana, have been featured below.

#### **1. Welcome to Ikeja Computer Village, Lagos, Nigeria: The E-Waste Hub of Africa**

Vast amounts of e-waste fill Nigeria's countryside with mountains made of computers and other electronics.<sup>41</sup> In this mountainous sea of computers, thousands of citizens in Lagos make a living by repairing old

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35. *Id.*

36. *Too toxic to toss out*, MX BRISBANE (Aug. 8, 2013), <http://www.mxnet.com.au/story/too-toxic-to-toss-out/story-fnh38q9o-1226693490491>.

37. *See* Fela, *supra* note 11, at 117.

38. *See* Roy, *supra* note 30; *see* Fela, *supra* note 11, at 117.

39. *Id.*

40. *Id.*

41. *See* Schmidt, *supra* note 13, at A 234.

computers, fax machines, and cell phones at their storefronts, which have been piled with refurbished products.<sup>42</sup> While villagers hope to sell the refurbished computers, many run into problems when trying to repair them as seventy-five percent of imported e-waste shipped to the area is just irreparable junk—trash.<sup>43</sup>

Lagos, Nigeria, serves as Africa's largest port city and acts as a major contributor of e-waste's spread to other areas of West Africa, as well as the continent as a whole.<sup>44</sup> Forty-five percent of Nigeria's imported e-waste comes from the United States and forty-five percent comes from the European Union.<sup>45</sup> Approximately five hundred shipping containers of e-waste enter Lagos each month, which equates to eight hundred computer monitors or 350 large television sets.<sup>46</sup> Nigeria's e-waste imports also cause concern for the rest of Africa because the country serves as a port for Africa's other imported agricultural goods. With so much e-waste in the surrounding area, contamination of imported goods becomes likely.<sup>47</sup> More importantly, the city of Lagos holds eighty-five percent of the entire population, meaning that a huge group of citizens have been exposed to the toxins in e-waste, either through their work or by living in this toxic city.<sup>48</sup>

## **2. Welcome to Agbogbloshie, Accra, Ghana: The Growing Metal Scrap Yard**

In May 2011, customs officers intercepted a shipment of old fridges, freezers, and microwaves en route to Ghana.<sup>49</sup> These shipments represent a microcosm of the illegal e-waste imports that enter Accra or its dumping yard, Agbogbloshie (the Yard). Agbogbloshie, pejoratively referred to as Sodom and Gomorra by locals, continues to serve as a large dumping yard and e-waste black market. Located in Accra, Ghana, near the Odaw River and the Korle Lagoon,<sup>50</sup> the Yard functions as a settlement for approximately eighty thousand slum dwellers who sleep in “rough[ly]

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42. *Id.* at A 233.

43. *Id.*

44. *Id.* at A 234.

45. Christine Terada, *Recycling Electronic Wastes in Nigeria: Putting Environmental and Human Rights at Risk*, 10 NW. U. J. INT'L HUM. RTS. 154, 49 (2012).

46. *See* Schmidt, *supra* note 13, at A 234.

47. *See* Bogale, *supra* note 23, at 249.

48. *See* Bogale, *supra* note 23, at 249; *see* Schmidt, *supra* note 13, at A 233.

49. Kasmira Jefford, *Trade in trash to Africa; Electrical equipment that needs recycling ends up in Third World*, THE SUNDAY TIMES, May 8, 2011.

50. *See* Ebenezer Forkuo Amankwaa, *Livelihoods in Risk: Exploring Health and Environmental Implications of E-waste Recycling as a Livelihood Strategy in Ghana*, 51 J. MODERN AFR. STUD. 551, 556 (2013) (*see* figure 1: map showing the Agbogbloshie e-waste recycling site).

shod [and] closely built wooden structures called kiosks” due to the lack of alternative, affordable housing and the proximity to their job.<sup>51</sup> By living in the dumps, inhabitants become exposed to contaminated water and food, unsanitary conditions, and an increased risk of needing medical attention.<sup>52</sup> These slum dwellers, primarily men, represent some of the 121,800 to 201,600 people sustaining themselves by participating in the e-waste black market,<sup>53</sup> which indirectly contributes approximately \$105 million to \$268 million into Ghana’s national economy.<sup>54</sup>

The e-waste market generates a steady source of livelihood for the impoverished communities in Accra and in Ghana as a whole.<sup>55</sup> The e-waste chain includes six groups of work, which is comprised of collectors, recyclers, refurbishers, middlemen, scrap dealers, and petty traders.<sup>56</sup> The most data exists for collectors, refurbishers, and recyclers.

Within Accra, 4,500 to 6,000 people make a living from collections (representing 62.5 percent to 71 percent of Ghanaians employed in collections). Approximately, ten to fifteen thousand people work in refurbishing old electronics (representing 64-71 percent of Ghanaians employed in refurbishing old electronics); 37,800 to 57,600 Ghanaians depend, partially or fully, on e-waste collection and recycling activities within the black market sector; and 84,000 to 144,000 Ghanaians depend, partially or fully, on e-waste refurbishing activities within the black market sector.<sup>57</sup>

Each year, laborers in Accra process ten to thirteen thousand metric tons of e-waste.<sup>58</sup> Although plentiful, the e-waste business has not been particularly lucrative and requires long hours for its participants who live in extreme poverty. Scavengers buy obsolete electronic equipment from consumers at low prices, approximately \$1 to \$2.50; then, they either dismantle the electronics themselves or pass the e-waste on to “specialized

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51. Natalia Ojewska, *Ghana’s Old Fadama Slum: “We Want to Live in Dignity”*, THINKAFRICAPRESS (Aug. 7, 2013), <http://thinkafricapress.com/ghana/old-fadama-slum>; see Amankwaa, *supra* note 50, at 557.

52. See Bogale, *supra* note 23, at 249; See Amankwaa, *supra* note 50, at 556. See Figure 1. The Yam Market and Tomato Market are adjacent to the Yard. Also, e-waste areas surround the food markets, making it highly likely that food has had exposure to chemicals released into the air through e-waste burning processes.

53. See Prakash, *supra* note 9, at 3.

54. *Id.*

55. See Amankwaa, *supra* note 50, at 552. While Ghana underwent a steady economic decline that did not accompany job creation (1984-2000), the informal job sector in e-waste abounded, providing many low wage jobs for individuals. The “informal” job sector is the largest employer, accounting for 66.7 percent of all employment in the country.

56. *Id.* at 557.

57. See Prakash, *supra* note 9, at 3.

58. *Id.* at 2-3.

recyclers”, who recover precious metals.<sup>59</sup> Scavengers work approximately 10-12 hours per day and report 300 to 360 hours per month; all these efforts return \$70 to \$285 per month.<sup>60</sup> The poor continue to depend on these substandard working conditions to survive because these jobs give so many impoverished people access to regular income through rapid cash flow—a benefit these slum dwellers did not have when they lived in northern Ghana in agriculturally driven households with chronic food insecurity.<sup>61</sup>

### III. IMPACTS OF DEVELOPED-WORLD DUMPING IN WEST AFRICA’S PORT CITIES

While e-waste collecting methods may vary between Lagos, Nigeria, and Accra, Ghana, e-waste has similar impacts on the surrounding environment, on human health, and on the nations’ economies. Each of these impacts will be discussed collectively, making special note for circumstances that differ.

#### *A. E-Waste’s Environmental Impact*

E-waste’s presence has had devastating effects on the environment’s current and future uses. While few studies specifically document environmental damage in West Africa, studies done in Guiyu, China—a similarly situated town near the coast of the South China Sea that implements slightly more advanced dismantling procedures for e-waste—aid our understanding of the impacts. In addition, various news networks and environmentalists have documented the harms of e-waste on West Africa. These harms primarily occur in the water and soil, having a domino effect on food supplies, animals, and future land uses.

#### **1. Negative Impact on Water Supplies**

The water in Lagos, Nigeria, and Accra, Ghana, has turned black.<sup>62</sup> Slick and oily, villagers dare not drink the dirty water.<sup>63</sup> Unfortunately, it only takes a small amount of mercury to blacken the water. Mercury is usually released into the environment in vapor form after laborers burn old electronics or give acid baths to old products.<sup>64</sup> Because these facilities

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59. *Id.* at 3.

60. *Id.*

61. *Id.*

62. *Ghana: Digital Dumping Ground*, PBS.ORG (Jun. 23, 2009), [http://www.pbs.org/frontlineworld/stories/ghana804/video/video\\_index.html](http://www.pbs.org/frontlineworld/stories/ghana804/video/video_index.html).

63. *See* Terada, *supra* note 45, at 46; *see* Lubick, *supra* note 15, at A 148.

64. *See* Chen, *supra* note 8, at 433.

process millions of devices containing mercury, a significant amount of mercury has already contaminated the air.<sup>65</sup>

Mercury enters water in two forms: through already contaminated air, and when villagers leave broken e-waste in the water. For example, mercury from old computer monitors continues to penetrate certain creeks near the Agbogboshie site where villagers left old monitors in the creeks as stepping-stones to cross the water.<sup>66</sup> Once mercury enters water, it mutates inorganic mercury into organic or living mercury, MeHg, which contaminates fish.<sup>67</sup> While people and animals living in the dumps receive exposure to mercury by both contaminated air and by eating the MeHg-contaminated fish, those living outside the dumps are exposed to mercury poisoning by just eating the contaminated fish.<sup>68</sup>

## 2. Negative Impact to Soil

Unregulated e-waste dismantling harms the soil just as much as it spoils water. Studies done in China reveal that e-waste dismantling facilities contain high levels of metals like lead and cadmium<sup>69</sup> as well as several flame-retardants like dechlorane plus (DP), polychlorinated biphenyl (PCBs), and a new class of contaminants called polybrominated diphenyl ethers (PBDEs).<sup>70</sup>

Lead comprises most of the used toxic metal in electronic devices and enters biological systems through food, water, air, and soil contamination.<sup>71</sup> For e-waste dumping grounds, lead primarily enters soil when laborers burn products and permit broken electronics to pile up on the ground.<sup>72</sup> Allowing old electronics to accumulate increases the likelihood that lead will contaminate the air. “[P]eople us[ed] e-waste to fill in swamps...whenever piles got too high, they would torch them...allowing fumes to promulgate the air.”<sup>73</sup> Allowing old electronics

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65. *Id.*

66. See Chen, *supra* note 8, at 433; see Lubick, *supra* note 15, at A 148.

67. See Chen, *supra* note 8, at 433.

68. *Id.*

69. *Farming: Reports Summarize Farming Study Results from Guangzhou Institute of Geochemistry*, AGRIC. WEEK, Aug. 22, 2013.

70. Zhang Ying, et. al., *Toxic Octabromodiphenyl Ether Is Being Transported from Rich to Poor via Electronic Waste*, 28 ROYAL SWEDISH ACAD. SCI. 2 (2009).

71. See Huo, *supra* note 14.

72. See Huo, *supra* note 14.

73. See Schmidt, *supra* note 13, at A 234.

to pile up also increases the chances that lead will enter the soil from flooding.<sup>74</sup>

Flame-retardants contaminate soil after being released into the air from dismantling procedures.<sup>75</sup> Scientists found significant amounts of DP in earthworms and trace amounts of PCB and PBDE in both the soil and women's breast milk.<sup>76</sup> Laborers have contaminated themselves and future generations by consuming tainted vegetables and animals that have come in contact with the contaminated soil.<sup>77</sup> Because unregulated e-waste dismantling taints vegetables and livestock, many Nigerians—who chose to maintain their livelihood through agriculture and not participate in e-waste management—have suffered physical ailments and harm to their ability to make a living.

### *B. E-Waste's Human Impact*

As evidenced by soil studies, people living in areas neighboring e-waste management sites experience comparable physical harm as the slum-dwellers living in the digital dumping grounds. Because children and women often work within these dumps,<sup>78</sup> they develop more severe cognitive and physical disabilities, which make them more vulnerable to the effects of these toxins. Most studies focus on the effects of e-waste chemical exposure on children, as developing fetuses and children harbor larger doses of toxins and are more vulnerable to neurotoxins than adults.<sup>79</sup> Studying youth also produces a more holistic understanding of e-waste toxin exposure as children start working in the e-waste market at young ages and become exposed to high-level toxicant mixtures throughout their laboring lifetimes.<sup>80</sup> Lead is the major neuro-toxicant found in young children followed by flame-retardants.

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74. See Amankwaa, *supra* note 50, at 568. When the stagnant Odaw River—which has been used for household and human waste discharge—in Ghana has recurring floods from rainfall, the River's banks overflow, allowing dirty water to mix with e-waste contaminants and spread across the area.

75. See Ying, *supra* note 70.

76. *Environmental Geosciences; Data from Chinese Academy of Science Advance Knowledge in Environmental Geosciences*, ECO. ENV'T & CONSERV., Oct. 4, 2013; see AGRIC. WEEK, *supra* note 69.

77. See ECO. ENV'T & CONSERV, *supra* note 76; see AGRIC. WEEK, *supra* note 69; see Terada, *supra* note 45, at 50.

78. See Amankwaa, *supra* note 50, at 559. Amankwaa's most recent study suggests that e-waste recycling is male dominated while female involvement revolves around petty trade in e-waste support services. The study also shows that workers are mostly young with 75 percent being between 15-29 years old; however, children as young as 5 reportedly engaged in e-waste burning activities.

79. See Chen, *supra* note 8, at 431.

80. *Id.* at 432.

### 1. Negative Impact of Lead on the Body

Lead exposure has been particularly problematic in the Yard: in 2008, soil studies at the Yard found that the concentration of lead in dry weight exceeded residential and industrial areas at 5,510 milligrams of lead to each kilogram of soil.<sup>81</sup> Toxicity levels tested in other wastelands, like Guiyu, China, demonstrate that young laborers have enough lead in their blood—15.3ug/dl, approximately 50 percent more lead than in control sites used in other studies<sup>82</sup>—to cause permanent retardation and brain damage, or worse, death.<sup>83</sup> No amount of lead exposure has been considered safe for humans as even small amounts of lead exposure, less than 10ug/dl, will impair a child's cognitive development.<sup>84</sup> Other studies found that 10ug/dl of blood-lead concentration may be associated with a 2 or 3 point decrease in IQ. Because e-waste dumping sites give young children continuous exposure to neuro-toxicants, these young children will likely suffer larger IQ deficits and more permanent neurological damage, including memory loss, hyperactivity, and deficits in the ability to pay attention.<sup>85</sup>

### 2. Negative Impact of Flame-Retardants on the Body

In Accra, Ghana, dioxin emissions from e-waste account for 0.3 percent of Europe's total dioxin emissions.<sup>86</sup> While this may sound negligible, this constitutes a high concentration of toxins within such a small area.<sup>87</sup> These toxic work areas contain fifty times more threatening pollutants than non-dumping areas.<sup>88</sup> When laborers burn the plastic casings off old electronics, flame-retardants are exposed, released in to the air, and turn into dioxin emissions.<sup>89</sup> Studies of children in Guiyu, China, indicate significant amounts of PBDEs, a type of flame retardant, within children's bodies, which holds similar for child laborers in West Africa.<sup>90</sup>

At the Yard, most children become exposed to flame-retardants by working in the dumps, often cutting themselves on rocks or broken pieces of old electronics. Documenters who visited these children “saw kids roaming barefoot over this material [as well as] chickens and goats [in the

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81. See Prakash, *supra* note 9.

82. See Chen, *supra* note 8, at 432-433.

83. See Ogunseitan, *supra* note 31, at 670.

84. *Id.*

85. See Chen, *supra* note 8, at 432-433.

86. See Lubick, *supra* note 15, at A 148.

87. *Id.*

88. See Bogale, *supra* note 23, at 227

89. See Lubick, *supra* note 15, at A 148.

90. See Bogale, *supra* note 23, at 227.



dump] which wind up in the local diet.”<sup>91</sup> Laborers have little to no protective gear for dismantling e-waste products, making it likely for daily cuts to occur and for toxic fumes to enter the body.<sup>92</sup> Flame-retardants also enter young children’s bodies from breastfeeding. Flame-retardants are particularly dangerous to human beings because they lead to brain damage, kidney damage, and respiratory illnesses like lung cancer.<sup>93</sup> Flame-retardants also cause skin damage, headaches, vertigo, nausea, chronic gastritis, and gastric ulcers.<sup>94</sup>

### *C. E-Waste’s Economic Impact on the Job Market*

Understanding the activities and lifestyles that occurred in Ghana and Nigeria prior to e-waste dumping helps us understand the relative harm done to these job markets. Notably, both areas had been struck by severe poverty.<sup>95</sup> Their citizens encouraged e-waste imports into their countries because it provided jobs to those living in poverty and appeared beneficial to developed nations, whose donations cost one-tenth of the expenses of attempting to recycle in facilities in domestic markets.<sup>96</sup> In both Nigeria and Ghana, farming used to occupy the areas that now serve as e-waste dumps. As mentioned earlier, toxins in e-waste have contaminated both water and soil, thus destroying the land’s potential for other non-e-waste-related future uses.

Aside from ruining the ability to use this land for other job purposes, the e-waste market also ensures that West Africa’s youth who engage in the market will remain uneducated, leading to a generation of workers with limited mobility in ascending to a different class. Sixty-five percent of children under eighteen years old in Accra, Ghana do not formally attend school, and forty-nine percent of slum dwellers in Agbogbloshie have no education at all.<sup>97</sup> Because these children work at least ten to twelve hours per day, they have few chances to gain education, especially outside of the

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91. See Schmidt, *supra* note 13, at A 234.

92. See PBS.ORG, *supra* note 62.

93. See Bogale, *supra* note 23, at 227.

94. See Huo, *supra* note 14.

95. See PBS.ORG, *supra* note 62. Prior to e-waste dumping, Agbogbloshie had been Ghana’s wetlands, where children played soccer and fished. This changed after hand-me-down computers arrived from the West in the 1990s. See Ojewski, *supra* note 51. In the late 1980s to early 1990s, “Old Fadama”, otherwise known as Agbogbloshie, became a shelter for impoverished northern communities after northerners fled from the Kokomba and Nanumba Tribal Wars). *Time Up for Sodom and Gomorrah*, PEACEFMONLINE.COM, Sept. 4, 2009, <http://news.peacefmonline.com/news/200909/25988.php>. Northerners eventually found work in agriculture by growing vegetables and selling them in nearby markets.

96. See PBS.ORG, *supra* note 62.

97. See Ojewski, *supra* note 51.

slums. The dumps lack public schools. Children that wish to have an education must spend money to travel outside of the settlement and must pay the high tuition rates at a private school.<sup>98</sup> Many would rather skip the hassles associated with education and just make a living.<sup>99</sup>

#### IV. AN E-WASTELAND OF INTERNATIONAL LAWS: CREATING THE BLACK MARKET

Three major international conventions have contributed to the creation of an e-waste black market, especially in West Africa: the Basel Convention, the Basel Amendments, and the Bamako Convention. While all of these conventions explicitly sought to limit or even ban exports of e-waste from developed countries to developing nations, each falls short, either in its language or due to the nature of international laws, to protect against continued “underground” e-waste dumping. This section reviews the shortcomings of these three major international conventions, how the shortcomings perpetuate an e-waste black market, and discusses why the e-waste black market’s existence prevents both the developing nations and developed nations from generating co-beneficial solutions to ending e-waste’s generation and pollution.

##### A. *The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)*

Adopted in 1989 in response to public outcry from the discovery that Africa and other developing nations had imported toxic waste from developed nations, 175 nations became parties to the Basel Convention, including Nigeria, Ghana, and the European Union.<sup>100</sup> The Convention seeks to protect human health and the environment from the adverse effects of “hazardous wastes” by reducing hazardous waste generation and promoting environmentally sound management of hazardous wastes, regardless of the place of disposal; restricting transboundary movements of hazardous waste except when in accordance with the principles of environmentally sound management; and applying a regulatory system to cases where transboundary movements may be permissible.<sup>101</sup>

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98. *Id.*; See Amankwaa, *supra* note 50, at 559.

99. *Id.* The Amankwaa study found that 89 percent of respondents had at least a high school certificate, “which can only guarantee minimum public sector work that is poorly paid and nearly non-existent.” Therefore, many find refuge in Agbogbloshie e-waste jobs.

100. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, *adopted on* Mar. 22, 1989, 1673 U.N.T.S. 28911, at 126-161 (the United States is not a party to the Convention) [hereinafter Basel Convention].

101. *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*, UNEP, at 5, <http://www.basel.int/Portals/4/Basel%20Convention>

In the Agreement, parties have the right to prohibit the import of hazardous wastes and must inform other parties when they are exercising such right; importing states must consent to shipment and an oversight board must approve or deny these proposed shipments.<sup>102</sup> Hazardous wastes include waste from particular waste streams in manufacturing processes, hazardous constituents of materials, and wastes considered hazardous under domestic laws of the exporting country, importing country, or transit country.<sup>103</sup> Wastes also require disposal operation, including proper recovery and adequate recycling operations.<sup>104</sup>

Within its Preamble, the Convention notes that, “States should ensure that [the one who generates the waste] should carry duties with regard to the transport and disposal of hazardous wastes and other wastes in a manner that is consistent with the protection of the environment” and that “hazardous wastes should, as far as is compatible with environmentally sound and efficient management, be disposed of in the State where they were generated.”<sup>105</sup>

Although the Convention’s Preamble explicitly acknowledges a duty for waste generators to dispose of their own waste, the Convention’s other language does not explicitly ban the movement of hazardous waste.<sup>106</sup> Instead, Art. 4 (2)(a) states, “each party shall take appropriate measures to ensure that the generation of hazardous wastes and other wastes within it is reduced to a minimum, taking into account social, technological, and economic aspects.”<sup>107</sup> The inclusion of the “taking into account social, technological, and economic aspects” clause prevents parties from efficiently and actually reducing hazardous waste because the clause gives parties an easy excuse—social, technological, and economical limitations—for not reducing their hazardous waste generation. Furthermore, the Convention contains subjective, ambiguous language, such as “take the appropriate measures,” which allows parties to determine what one considers appropriate with consideration to reducing hazardous wastes.

The Convention also requires parties to “prohibit all persons under its national jurisdiction from transporting or disposing of hazardous wastes or other wastes unless such persons are authorized or allowed to perform

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/docs/text/BaselConventionText-e.pdf.

102. See Basel Convention, *supra* note 100, at 131; see Bogale, *supra* note 23, at 239.

103. See Pratt, *supra* note 21, at 596.

104. *Id.*

105. See Basel Convention, *supra* note 100, at 127.

106. See Ogunseitán, *supra* note 31, at 670.

107. See Basel Convention, *supra* note 100, at 131.

such types of operations.”<sup>108</sup> Several issues have arisen with respect to this requirement, including a proper enforcement mechanism to ensure that one’s nationals do not transport or dispose of hazardous wastes and the ease of manipulating the Convention’s language. In particular, States have been relatively relaxed with this requirement and often ignore it because it burdens the State and makes imports too costly.<sup>109</sup> Ironically, the Convention seeks to target illegal trafficking, but does very little to prevent illegal e-waste trafficking as the Convention lacks real enforcement mechanisms to sanction States who choose not to live up to the standards laid out in the Convention. Furthermore, although hazardous wastes have been well defined within the first two articles of the Convention, many countries manage to skirt the requirements of the Convention by mislabeling exported products as a product that is permissible for exportation, such as labeling these products as “scraps.”<sup>110</sup>

Above all, the Basel Convention’s success in eliminating e-waste pollution has been compromised by the basic nature of international treaties, as all conventions have issues ensuring that important states become parties to the agreement. As of January 2011, the United States, one of the largest generators of e-waste, still refused to become party to the Basel Convention.<sup>111</sup> Because the United States has not ratified the agreement, it will not be subject to the requirements of the treaty.

Today, despite the presence of efficient recycling facilities in Europe and state laws requiring otherwise, two hundred and fifty thousand metric tons of e-waste enter Benin, Cote D’Ivoire, Ghana, Liberia, and Nigeria annually.<sup>112</sup> These numbers reflect the aforementioned weak points of the Convention. This weakness means that the e-waste market will continue as an underground black market.

*B. The Amendment to the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, “The Ban Amendment” (1995)*

During the third meeting of the Conference of the Parties to the Basel Convention in 1995, parties like Nigeria, Ghana, and the European Union adopted the Ban Amendment.<sup>113</sup> Taken one step further than the Basel Convention, the Ban Amendment provides for a global ban on exporting

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108. *Id.* at 132.

109. See Bogale, *supra* note 23, at 239.

110. See Lubick, *supra* note 15; see *Need for Comprehensive Solutions*, *supra* note 13, at 2401.

111. See Pratt, *supra* note 21, at 610.

112. See Lubick, *supra* note 15.

113. *Id.*

hazardous wastes intended for final disposal and recycling from developed countries (named in Annex VII) to developing countries (those not named in Annex VII).<sup>114</sup> More specifically, *Decision III/1: Amendment to the Basel Convention* recognized that e-waste exports and imports, especially to developing countries, had a high risk of “not constituting environmentally sound management of hazardous wastes.”<sup>115</sup> The Decision amended art. 4(a) to require each Annex VII party to prohibit all trans-boundary movement of hazardous wastes destined for operations to non-Annex VII States.<sup>116</sup> The definition of waste included any used equipment not tested and not known to be functional. If this type of waste contained hazardous substances, the control procedures under the Basel Convention would take effect.<sup>117</sup>

While these requirements would have effectively banned e-waste and likely diminished e-waste’s impact on the developing world today, the structure and ratification process for treaties diminished the effectiveness of the Ban Amendment. Under the Basel Convention, art. 17 (5):

Instruments of ratification, . . . of amendments . . . shall enter into force between Parties having accepted them on the ninetieth day after the receipt by the Depository of their instrument of ratification . . . by at least three-fourths of the Parties who accepted them or by at least two thirds of the Parties to the protocol concerned who accepted them. The Amendment shall enter into force for any other Party on the ninetieth day after that Party deposits its instrument of ratification . . . of the amendments.<sup>118</sup>

As of October 11, 2013, the Ban Amendment only reached seventy-six parties and was not yet in force - this also applied to Annex VII.<sup>119</sup> The European Union approved the Amendment on September 30, 1997.<sup>120</sup>

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114. See Bogale, *supra* note 23, at 241; UNEP, *The Basel Convention Ban Amendment*, <http://www.basel.int/Implementation/LegalMatters/BanAmendment/tabid/1484/Default.aspx> (Annex VII includes States that are members of the European Communities, Liechtenstein, and the OECD, Organization for Economic Co-operation and Development) [hereinafter Ban Amendment].

115. *Id.*

116. *Id.*

117. Sean Davidson, *Nations deny e-cycling policy change*, AMER. METAL MKT. (May 8, 2013), <http://www.amm.com/Article/3203025/Search/Results/Nations-deny-e-cycling-policy-change.html?PubDate=05-08-2013&PageMove=2>.

118. Conference of the Parties to the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal, Decisions Adopted by the Third Meeting of the Conference of the Parties to the Basel Convention, 3rd Meeting, Sept. 18-22, 1995, UNEP/CHW.3/35, at 1-2 (Nov. 28, 1995), available at [http://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mt\\_dsg\\_no=XXVII-3-a&chapter=27&lang=en](http://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mt_dsg_no=XXVII-3-a&chapter=27&lang=en).

119. *Id.* The United States has not become a party to the Basel Convention nor the Ban Amendment.

120. *Id.*

Nigeria ratified the document on May 24, 2004, and Ghana ratified the document on June 9, 2005. Neither party took any further actions that would lead to the Amendment's enforcement.<sup>121</sup> Because this Amendment is not yet in force, the harsher requirements of a complete ban on exports and imports of hazardous waste will not come into effect, which demonstrates that the Ban Amendment is as "all talk and no action."

Furthermore, because this Amendment has yet to take force, developed nations and industries have sought to include ambiguous language within the Amendment and its future conferences so that the explicit e-waste prohibition will be less effective. During the eleventh Conference of the Parties to the Basel Convention in Geneva in May 2013, developed nations and industries sought an exemption within the definition of "wastes" so that repaired electronics would not be included in the ban on e-waste exports to developing nations.<sup>122</sup> However, developing nations disfavored this exemption because it diminished the entire impact of the Amendment. The exception would allow developed nations to potentially have all e-waste—disguised under the cloak of subjective language like "repaired"—exported from their countries. The proposed change took away the control measures that the Amendment sought to implement. While developing nations, particularly African leaders,<sup>123</sup> managed to ensure that this proposed change will not occur, the Amendment will not likely gain support from the developed world if the Amendment remains in its current state.

*C. The Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa (1991)*

Article 11 of the Basel Convention encourages parties to enter into regional agreements on hazardous waste to help achieve the objectives of the Basel Convention.<sup>124</sup> Empowered to act by the Basel Convention, frustrated by the failures of the Basel Convention to prohibit trade of hazardous wastes to developing countries, and aware of the realities that

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121. *Id.*

122. See Davidson, *supra* note 117; *African leaders say no to European Union e-waste dumping*, UPI, Aug. 9, 2013, [http://www.upi.com/Science\\_News/2013/08/09/African-leaders-say-no-to-European-Union-e-waste-dumping/UPI-16821376084361/](http://www.upi.com/Science_News/2013/08/09/African-leaders-say-no-to-European-Union-e-waste-dumping/UPI-16821376084361/). In May 2013, the world's developing countries succeeded in blocking an attempt by the developed world, including the U.S., EU, and Canada, to create loopholes within the Basel Convention's hazardous waste control procedures that would exempt 'repairable electronic waste.' In August 2013, African leaders called for more stringent environmental laws in Europe saying, "we will no longer be Europe's digital dumping ground."

123. *Id.*

124. See Basel Convention, *supra* note 100, at 138.

e-waste imports into Africa had become more prevalent, African nations sought to address regional issues of e-waste trade and tackle the e-waste market by banning imports of e-waste into Africa. In 1991 in Bamako, Mali, the twelve nations in the African Union negotiated the Bamako Convention, which took force in 1998.<sup>125</sup>

The Bamako Convention asserts and encourages that effective avoidance of environmental health related consequences requires minimum production of e-waste.<sup>126</sup> Under Article 4(1)-(4), all parties must “take appropriate legal, administrative, and other measures to prohibit the import of hazardous waste, for any reason, into Africa” from non-African Union parties.<sup>127</sup> Importing hazardous waste into Africa from non-African Union parties has been deemed explicitly illegal and a criminal act.<sup>128</sup>

Among other requirements, the Bamako Convention also requires parties to forward information related to illegal hazardous wastes to the Secretariat for distribution to all contracting parties; report all hazardous waste generated so the Secretariat can produce a complete hazardous waste audit; adopt a precautionary principle approach to e-waste pollution; and deny exportation of hazardous wastes to states that do not have adequate facilities for environmentally sound disposal.<sup>129</sup> Generally, the Convention regulates known and potentially hazardous wastes, criminalizes importation of foreign hazardous waste into Africa, and limits the movements of hazardous waste already located within Africa.<sup>130</sup>

While the Bamako Convention’s stringent requirements would make it highly effective, it contains too many requirements that need significant funding in order to be properly implemented. Because of the need for significant funding, several key nations that have larger e-waste issues have not ratified the Convention.<sup>131</sup> For example, taking appropriate administrative measures to prohibit e-waste importation within a developing country could cost a substantial amount of money that the country does not necessarily have to allocate. Because of poor funding for government programming and possible political pressure within

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125. *First Conference of Parties to the Bamako Convention*, UNEP (June 24-26, 2013), <http://www.unep.org/delc/BamakoConvention/tabid/106390/Default.aspx>.

126. *See* Bogale, *supra* note 23, at 247.

127. Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa, *adopted on* Jan. 30, 1991, 2101 U.N.T.S. 36508, at 242-274 [hereinafter Bamako Convention].

128. *Id.* at 245.

129. *Id.* at 245-249.

130. *See* Bogale, *supra* note 23, at 247.

131. *See* Bamako Convention, *supra* note 127. Neither Nigeria nor Ghana have ratified the Bamako Convention; today, only 17 African nations have done so.

developing countries, the Bamako Convention has not successfully prevented its signatories from importing e-waste from the developed world.

*D. How these International Conventions' Shortcomings Perpetuate the E-waste Black Market*

The Basel Convention, Bamako Convention, and the Ban Amendment have three major problems that unconsciously help to perpetuate the e-waste black market. First, international key players will not become party to the conventions. As seen with the Basel Convention, the United States has refused to ratify the convention so that it will not be held to such requirements. Unfortunately, this means that the United States may continue to dump its e-waste into developing nations. More importantly, the United States can be strategic about which developing nations will become an e-wasteland by choosing developing nations that have not ratified more stringent conventions, like Nigeria and Ghana with regard to the Bamako Convention. Therefore, the United States will not likely ever sign one of these conventions because its current state of limbo allows it to reap the benefits of using low cost e-waste management facilities in the developing world.

Second, countries like those in the European Union who have tried to enforce bans on e-waste exports also face the pressure of spending more resources on managing their own e-waste. Because of this pressure, these countries attempted to change the Ban Amendment's language so that the standard for what would constitute waste would be relatively flexible. Although these attempts failed, developed nations have dodged around the illegal imports issue by manipulating trade tariff classifications and labeling.<sup>132</sup> Manipulating tariff classifications and labels benefits developed nations because it ensures that developing nations will want to continue the trade of e-waste due to low costs for the importer; if tariff classifications properly accounted for e-waste, developing nations would have to pay tariffs on old electronics at the same price as new ones.<sup>133</sup>

Third, the Conventions require more financial backing to support their stringent requirements. Both developed and developing nations benefit more, at least in the short term, by not investing in mechanisms that would properly enforce the stringent requirements, like those calling for a complete ban of exporting e-waste in the Bamako Convention.

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132. See Schmidt, *supra* note 13, at A 234. No one knows how much global e-waste penetrates trade because of current tariff schedules, which dictate fees for export commodities but have not assigned export codes to waste electronics other than batteries.

133. *Id.*



Instead of implementing requirements that demand significant funding, countries permit relaxed standards in order to reap the short-term benefits of participating in a black market.

### **1. African Nations Participating in the Black Market**

African nations choose to engage in the black market and pay for electronics that they cannot sell because even junk has some value. Importers purchase shipping containers by weight, at about \$5,000 per forty-foot container, and not by the value inside the container.<sup>134</sup> Because shipping containers are purchased by weight, adding waste will average the load and might lead to finding a few “hidden treasures” that can be spruced up and sold.<sup>135</sup> Even if the container did not have any treasures, scrap components could potentially be harvested to make an otherwise irreparable computer sitting in a storefront repairable.<sup>136</sup> With a used computer selling for \$130, it does not take much to cover shipping costs<sup>137</sup>; even irreparable waste has value because laborers can strip it down to precious metals by dumping the electronics in acid baths that leave behind copper, silver, and other small pieces.

### **2. Developed Nations Participating in the Black Market**

Developed nations participate in e-waste dumping because they can take advantage of relaxed regulations and it costs significantly less to dump than it does to develop proper e-waste facilities. Developed nations keep costs down by allowing e-waste to travel murky routes populated by numerous recyclers and brokers.<sup>138</sup> Recyclers on these routes then add to the amounts of e-waste that arrive at dumping sites.<sup>139</sup> With a single monitor costing at least fifteen dollars to recycle, recyclers have found it more profitable to coordinate with other exporters and send junk overseas.<sup>140</sup> Together, exporters and recyclers negotiate with developing

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134. *Id.*

135. *Id.*

136. *Id.*

137. *Id.*

138. *Id.*

139. Cahal Milmo, *Dumped in Africa: Britain's toxic waste; Children exposed to poisonous material in defiance of UK law Special Investigation Child scavengers exposed to hazardous components*, THE INDEPENDENT, Feb. 18, 2009 (Another example includes Britain's dumping into Africa, even though it breaches the country's laws and international obligations: The Independent, Sky News, and Greenpeace teamed together to break a television and place a tracker on it to see where it would travel. The television, broken beyond repair, made it into Lagos, Nigeria after it left a civic amenity site in Basingstoke, England. A London dealer bought the television as well as 940,000 tons of domestic e-waste and exported it to Nigeria).

140. See Schmidt, *supra* note 13, at A 234.

nation buyers to determine how much junk the buyer will accept in exchange for a specified number of high value items:

I could come up with half of a load of good stuff and say, 'If you want it, you have to take the bad,' and sell it all by the pound, then the guy in Africa will crunch the numbers and say, 'OK, if you put a few more Pentium IIIs in there, you've got a deal.'<sup>141</sup>

More importantly, developed nations successfully dump because of corrupt customs officials at the importer's port cities. Customs officials infamously assist in the e-waste black market by mislabeling imported goods with unnecessary exemptions or even turning a blind eye to imported goods.<sup>142</sup> A prime example of this occurred in the Koko, Nigeria scandal, in which Italian businessmen bribed Nigerian port officials to conceal drums of polychlorinated biphenyl (PCB) that the Italian businessmen wanted smuggled into Nigeria.<sup>143</sup> It took nine months for the Nigerian government to discover the four thousand tons of PCB concealed in an inhabited village.<sup>144</sup> Both developed nations and developing nations depend on the e-waste black market's existence for security.

#### *E. How a Black Market Generates One-sided Solutions to E-Waste Pollution*

Even though developed and developing nations alike have suggested a complete ban on e-waste, the current existence of an e-waste black market makes a ban mostly detrimental to the parties involved, thus making such an option unviable.

#### **1. Benefits and Detriments of an E-Waste Ban to Developed Nations**

While developed nations would gain access to new job markets, desist in treating developing nations as former colonies, and inherit the "good feeling" of keeping Earth clean through sustainable consumption of electronics, the current e-waste black market model has been highly profitable for the developed nations and there are not adequate facilities and measures in place in domestic markets to realistically take on the daunting task of e-waste management.<sup>145</sup> In 2009, the e-waste market,

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141. *Id.*

142. See *Need for Comprehensive Solutions*, *supra* note 13, at 2401.

143. See Terada, *supra* note 45, at 48.

144. *Id.*

145. See Larry Pynn, *Dangerous waste bound for China is intercepted*, THE VANCOUVER SUN, Dec. 22, 2006 (Canada found it is simply easier and cheaper to continue illegally exporting hazardous waste. Federal agencies recently investigated and intercepted Canada's fifty containers of e-waste that were heading to China).

primarily the black market, amounted to an \$11 billion industry; the industry remains lucrative based on its current exploitation of developing nations.<sup>146</sup> Individual European firms engaged in the e-waste black market have made more than €2 million per year.<sup>147</sup> In the United States, a Vermont resident built an e-waste empire that makes its profits in exporting hazardous wastes from non-working electronics to Accra, Ghana; he exports thirteen million electronics under the classification of “repair.”<sup>148</sup> Furthermore, some scholars have argued that bringing e-waste management to the United States would lead to exploitation of the United States’ most vulnerable populations.<sup>149</sup>

## **2. Benefits and Detriments of an E-Waste Ban to Developing Nations**

While some communities within developing countries desire a complete ban on e-waste,<sup>150</sup> a complete ban would have detrimental effects on the citizens in these developing countries including a loss of livelihood, the persistent problem of polluted and unusable land, and the possibility of a continued yet strengthened e-waste black market.

A ban on e-waste would take away the livelihood of these individuals. Disposal sites employ at least one hundred thousand people, including many women and children.<sup>151</sup> While these workers make an average of two to four dollars per day,<sup>152</sup> a ban could make these wages dip even lower. When regular supply or collection becomes hindered, the e-waste workers have less to collect, which harms the entire business and requires the employer to drop wages earned for collections.<sup>153</sup> Allowing a ban ignores the reason why so many poor people in developing countries turned to the black market in the first place. “[P]overty is the reason people have been lured into accepting substances that [they otherwise] would not

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146. See Behring, *supra* note 29.

147. See Jefford, *supra* note 49.

148. Dan D’Ambrosio, *Used electronics: opportunity or toxic waste?*, THE BURLINGTON FREE PRESS, Sept. 26, 2013.

149. See Dayaneni & Shuman, *supra* note 10. Experiments with managing e-waste in the United States suggest that it would parallel the experiences of those in developing countries by using the United State’s most vulnerable population—prisoners—as e-waste scavengers. Private prisons in Arkansas have forced prisoners to manage e-waste, bringing hazardous waste back into the land near prisons and hurting citizens.

150. Anne Eckstein, *EU/UN/Hazardous Waste: Developing Countries Score Victory Over Developed World*, May 31, 2013, <http://europolitics.eis-vt-prod-web01.cyberadm.net/sectorial-policies/developing-countries-score-victory-over-developed-world-art351183-15.html>; see Davidson, *supra* note 117.

151. See Behring, *supra* note 29; see also Lubick, *supra* note 15, at A 149.

152. *Id.*

153. See Prakash, *supra* note 9, at 3.

have.”<sup>154</sup> Nigeria and Ghana have large labor forces with no job infrastructure, requiring many workers to work cheaply. Without a robust job infrastructure, these impoverished workers must remain dependent on developed nations’ outsourced recycling jobs, which fluctuate with the developed world’s consumption patterns.<sup>155</sup> The harm to an individual’s livelihood always circles back to poverty and the lack of job dependence that developing nations have from developed nations.<sup>156</sup> Therefore, the poor in these nations will likely continue to work in the black market rather than worsen their conditions.

A ban on e-waste also ignores two critical problems within developing nations. First, it ignores that the land cannot be used for other development and growth in the future.<sup>157</sup> As already stated, the land in these areas used to serve villagers for agriculture and fishing purposes. Because of all the contamination and toxicity, this land can no longer be used for such purposes. Second, even with a ban, already dumped e-waste will continue to decompose on the land. Without any sustainable methods of clean up, Ghanaians and Nigerians will still need a method to rid these areas of millions of tons of e-waste.<sup>158</sup>

#### V. DESIGNING INTERNATIONAL LITIGATION WITH MONETARY COMPENSATION AS AN APPROPRIATE INTERIM MEASURE

In order for international litigation with monetary compensation to be effective in the long-term cleanup of e-waste dumping sites, it must

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154. Manasvini Krishna & Pratiksha Kulshrestha, *The Toxic Belt: Perspectives on E-Waste Dumping In Developing Nations*, 15 U.C. DAVIS J. INT’L L. & POL’Y 71, 74 (2008).

155. *Id.*

156. Nancy Weil, *Study: E-waste dumping victimizes developing nations*, INFOWORLD DAILY NEWS, Oct. 28, 2005, <http://www.infoworld.com/article/2673283/applications/study--e-waste-dumping-victimizes-developing-nations.html>.

157. *Indigenous method to treat e-waste*, DECCAN CHRONICLE (Apr. 11, 2012), available at <http://www.sustainabilityoutlook.in/news/indigenous-method-treat-e-waste>. Last year, The Central University of Gujarat, in Tamil Nadu, India, came up with ‘bio-remediation’ as a method to compost the e-waste in landfills. This five-year study uses microorganisms to decay heavy metals. Currently, the bio-remediation is used to remove contaminants from soil, groundwater, surface water, and sediments. The team will try to decontaminate e-waste from the soil-water environment surrounding the University. But, these methods are slow developing and it is unclear whether this technology could successfully decontaminate the damage caused by millions of tons of e-waste.

158. ‘Green’ initiative, GULF DAILY NEWS, Apr. 7, 2012; *Government and Policy; Investigators at University of Pretoria Describe Findings in Government and Policy*, POL. & GOV’T WEEK, Sept. 26, 2013. South Africa has attempted to address the e-garbage path in Bahrain by building recycling infrastructure, which includes using the unwanted or broken electronics into cement mixture. However, it is unknown whether recycling the broken electronics into cement further damages surrounding land and water.

ensure that e-waste black market “recycling” is less efficient than proper e-waste recycling. Herein lies the problem: the black market’s recycling methods disregard human lives, the quality of those lives, and the quality of the surrounding environment in order to make e-waste management as cheap as possible. As long as an e-waste black market exists, key industrialized nations will unofficially continue to use it. Therefore, to address this issue, monetary compensation must make proper recycling methods more efficient for developed nations so that the e-waste black market’s primary business will dry up and allow those laborers in the informal market to horizontally shift their work to a regulated e-waste market with higher wages. To have international litigation with monetary damages, a framework must be developed to address the structure of international claims and to generate a formula that creates positive results through monetary compensation. In addition, one should consider whether an international tribunal should be established to handle these specific claims. While many questions abound when creating a new framework, this article seeks to explore a few of these questions with hope that further scholarly work will develop surrounding the issue.

#### *A. What Should the International Claim Look Like?*

When dealing with international litigation, one must consider what a potential claim would look like as well as what it seeks to accomplish. Potential international black market e-waste litigation poses a unique challenge in that it seeks to address the traditional reasons for desiring an international environmental law claim as well as an international human rights law claim.<sup>159</sup> While environmentally based claims focus on environmental damage, human rights based claims tend to focus on impacts to human beings.<sup>160</sup> To adequately address the needs of laborers in developing nations, the global environmental damage, the consumption patterns of developed nations’ consumers, and the developed nations’ recycling needs, international e-waste litigation must take an approach that intersects these two international areas of law into a hybrid approach of environmental damage impacting human rights.<sup>161</sup>

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159. Hari Osofsky, *Learning from Environmental Justice: A New Model for International Environmental Rights*, 24 STAN. ENVTL. L.J. 71 (2005).

160. *Id.*

161. *Id.* Osofsky’s approach notes as well as acknowledges a complex scheme where an abuser may be any or all of the following at any given time: a state actor, a corporation, or an individual. The approach would work well because it acknowledges that human harm and environmental harm can occur simultaneously and in a range of factual situations.

If we apply a hybrid international law approach to e-waste litigation, one must answer questions regarding sovereignty — who would be able to bring the claim, and who would be able to collect what type of judgment? One would also need to consider whether current international courts are sufficient to handle the unique caseload for e-waste or whether an international tribunal should be established to handle such claims.

Currently, states have non-breacheable sovereignty except in cases of transboundary or global impacts.<sup>162</sup> In addition, individuals have no standing to bring claims before the International Court of Justice, but victims of international human rights abuses have been able to obtain positive judgments provided that the state has no difficulty collecting from foreign nationals.<sup>163</sup> Ideally, a hybrid approach would obtain sovereignty by showing that e-waste is transboundary in nature or has a global impact on the environment. The elements of the claim would then focus on the negative impact of black market e-waste on a particular nation, as well as how the black market violates the right of individuals within a particular nation “to life, liberty, and security of person” and “to a standard of living adequate for health and well-being.”<sup>164</sup>

#### *B. What Sort of Formula Should Be Used to Yield Positive Results?*

With an appropriate formula for calculating a nation’s money damages, monetary compensation would acknowledge the e-waste black market, as well as how it disregards current international measures. Further research and calculations are necessary in academia to derive a formula for monetary compensation that would yield positive results in diminishing the effectiveness of the e-waste black market. However, an effective formula will take into consideration the following: 1) physical and mental harm caused to the nation’s e-waste laborers, based on damage to bodily organs, limbs, and brain development or functioning; 2) wages earned by laborers within the six main clusters of e-waste occupations; and 3) lack of access to clean crops and water.

By considering these main factors within a potential monetary compensation formula, the compensation would effectively deter a black market by making it more costly to engage in it; create a source of income for long-term e-waste disposal solutions that include updated recycling facilities in both industrialized nations and developing nations; and provide immediate cash flow to start building actual, regulated waste

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162. *Id.*

163. *Id.*

164. Art. 3, Art. 25 (1), Universal Declaration of Human Rights, available at <http://www.un.org/en/documents/udhr/>.

management facilities in developing nations. Therefore, a proper compensation formula would be the key to the eventual re-shift of informal e-waste management to formal e-waste management, which means laborers could likely receive decent wages, safety equipment, and relief for their health needs.

### *C. What about an International Tribunal for E-Waste?*

Once a proper formula is determined for potential e-waste claims, one must consider where such claims should be heard. As mentioned earlier, current international courts and tribunals do not address the unique nature of potential e-waste claims because most international courts deal with either international human rights claims or international environmental claims in a vacuum. To ensure that e-waste claims have a proper forum tailored specifically to the unique issues they present, an international tribunal for e-waste must be established. An international tribunal on e-waste is ideal because international tribunals enhance the credibility of commitments already made by states; ensure that subject-based claims can be addressed in one particular court; and ensure that effective remedies may be reached by making such requirements known and subject to the Tribunal's jurisdiction.<sup>165</sup> Furthermore, an International Tribunal for E-waste would be beneficial because international tribunals have become more commonly accepted, powerful, and diverse.<sup>166</sup> To establish a tribunal, one must first consider some preliminary questions about the Tribunal's scope, which include 1) what type of jurisdiction the Tribunal should have, 2) who should be able to bring claims, 3) should the tribunal be based on subject matter, and 4) should the tribunal be further limited to individuals in a specific nation state or to a specific time period so that the caseload of the Tribunal would not be overbearing?

To remedy the needs of individual complainants against first-world actors like the United States and the European Union, the International Tribunal for E-waste should use compulsory jurisdiction and permit individuals and NGOs to submit complaints against states who permit e-waste to illegally enter their state. This comports with the "polluter pays"

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165. Laurence Helfer, Anne-Marie Slaughter, *Why States Create International Tribunals: A Response to Professors Posner and Yoo*, 93 CAL. L. REV. 1, 3 (2005).

166. Eric Posner, John Yoo, *Judicial Independence in International Tribunals*, 93 CAL. L. REV. 1, 3 (2005). International Tribunals have become more powerful due to increased usage of compulsory jurisdiction—jurisdiction where States have given up their choice of whether to be subject to a court's jurisdiction. In addition Tribunals have become more powerful because they act independent of State interests that created them and do not simply pander to the politics of a particular group. Furthermore, Tribunals rely on establishing themselves in particular area of law, which ensures that no one court presides over all other international tribunals.

principle of environmental law, which seeks to have responsible states pay for their environmental damage as well as gives individuals the ability to have their human rights violations known and redressed by the international community. The illegality of e-waste should be determined using the requirements and Annexes from the Basel Convention, the Ban Amendment, as well as any relevant regional e-waste conventions in instances where individuals from that region seek to recover monetary damages from another State.

In addition, the Tribunal should be limited to claims that commenced in 1986 or later because e-waste started accumulating around this time. Particular consideration should also be given to individual claims that have a continuous nature, which can be documented when multiple individuals from the same town or city complain about the same instances of e-waste over a period of time.

To ensure that the Tribunal does not have a superfluous caseload due to multiple individuals reporting the same incidences of continuous e-waste, it may be necessary to limit the court's scope and the individuals that may seek monetary damages by limiting the scope to include particular complainant nations. Because an International Tribunal for E-waste has never been tested and certain states' nationals have been victims to the harms of e-waste over others, a "trial-run" tribunal would ideally be established in Nigeria, Ghana, or China. A smaller nation with less e-waste dumping would also be an excellent indicator for a "test" tribunal because it would allow the international community to better understand whether the guidelines specified would need to be further limited to maintain the effectiveness of the Tribunal. Future scholarly discussion should ensue around the establishment of an International Tribunal of E-waste; using these preliminary guidelines for the Tribunal's establishment will ensure that individuals have a judicial remedy to the human right violations, economic harm, and environmental damage occurring to them because of e-waste.

## VI. CONCLUSION

Designing and agreeing upon the proper way to use an international tribunal for e-waste with international litigation to obtain monetary damages will require more academic dialogue surrounding the issues. If the international claim shifts the informal e-waste market sector to a formal e-waste market sector that potentially gives laborers safer working conditions, wages, and an overall cleaner environment, then dialogue concerning a proper forum for international litigation of e-waste issues that result in monetary damages will be a worthy dialogue.



Developed nations have been exploiting developing nations for decades with respect to e-waste. Therefore, building proper recycling management facilities will take time in order to adequately address the millions of tons of e-waste. The proposed International Tribunal for E-waste, which uses international litigation with a monetary remedy, can and should be one of the interim methods used to start putting e-waste management on the right path. Developed nations must pay for damage already caused to the environment and people in developing nations. This cycle of exploitation — which externalizes costs for the short-term convenience of inexpensive e-waste disposal — must end or else future generations will inevitably live in the environmental fallout we have created.

