

## OTHER INTERNATIONAL DEVELOPMENTS

## Exporting Responsibility – Shipbreaking in South Asia – – International Trade in Hazardous Waste –

by Katie Paul\*

### Introduction

In 1991, World Bank chief economist Lawrence Summers articulated his opinion that "...the economic logic behind dumping a load of toxic waste in the lowest wage country is impeccable"<sup>1</sup> in an internal memo later leaked to the press. While Summers did not invent this idea, he was the first to explicitly suggest international trade as a viable policy option to deal with the problem of hazardous waste disposal. The "impeccable economic logic" of North to South waste trade had already become glaringly clear to the world by the time Summers wrote his fateful memo.<sup>2</sup> Still, his comments provoked outrage among environmental and human rights activists worldwide and sparked an ongoing debate on the ethics and legality of international trade in hazardous waste. This article explores both sides of this debate and analyses its implications for the shipbreaking industry in South Asia.

### The International Waste Trade

Globally, about 400 million tons of hazardous waste is produced annually, 98 per cent of which comes from OECD (Organization for Economic Cooperation and Development) countries.<sup>3</sup> The OECD is a group of 30 of the most economically developed countries of the world; it is generally synonymous with the rich, Western countries. More than 75 per cent of OECD-generated hazardous waste comes from the United States alone, primarily due to the fact that US production of waste increased ten-fold between 1980 and 1990.<sup>4</sup> OECD countries export on average only about 1 per cent of their domestic production of hazardous wastes.

With the burgeoning environmental movement in the early 1970s, industrialized countries such as the United States began to adopt strict regulations on hazardous waste storage and disposal. Though beneficial in terms of reducing health risks and minimizing environmental degradation, these new policies greatly increased the cost of hazardous waste treatment and disposal; in the US, the price of dumping of one ton<sup>5</sup> of hazardous waste increased from US\$15 in 1980 to US\$250 in 1989.<sup>6</sup> In Germany, the cost of incinerating a tonne of hazardous waste, depending on the type, ranges from US\$700–US\$6450.<sup>7</sup>

The increasing costs of domestic disposal have forced companies to look abroad for other options. A new market for waste dumping in South Asia emerged in the early 1990s, and, today, this region dominates imports of haz-

ardous waste from industrialized countries. From 1990 to 1994, corporations based in Australia, North America and Europe shipped more than 5 million tonnes of toxic wastes to Asia, mostly in the form of scrap metal, but also including plastic and lead wastes, cadmium, aluminum, copper, tin, nickel, zinc, ash and residues, medical waste, electronic waste, and other hazardous and radioactive wastes.<sup>8</sup> The US, Australia and Canada are together responsible for about half of the toxic zinc and lead wastes imported by India.<sup>9</sup> Due to high disposal costs in OECD countries coupled with international trade liberalization, exports of hazardous wastes along a North to South economic gradient have only accelerated through the 1990s.

The economic rationale of hazardous waste trading is relatively straightforward: poor South Asian countries can dispose of hazardous waste more cheaply than can rich Western countries. Lawrence Summers argued that the negative effects of hazardous waste dumping would be less costly to developing countries, so it would make sense for the industrialized world to export its waste. While the language and tone of his memo were offensive, most agree that Mr Summers' argument is difficult to dispute on economic grounds.<sup>10</sup>

Of course, one can hardly claim that South Asian countries have the same environmental and labour standards as developed countries, and it is precisely this lack of regulation and poor enforcement which leads to lower disposal costs. Michael Rauscher, a specialist in international trade and the environment at the University of Rostock's Institute of Economics, explains that: "... these importing countries ... lack the capability of environmentally sound treatment or disposal. Nevertheless, they are willing to accept these substances for rather low compensation payments, that save the exporters a substantial amount of money".<sup>11</sup> The developing economies of South Asia understandably place a higher priority on economic growth and development, which ultimately requires capital, than on environmental protection or labour justice. Rep. James Florio (Democrat senator: New Jersey) noted nearly two decades ago that, "Like water running downhill, hazardous wastes invariably will be disposed of along the path of least resistance and least expense".<sup>12</sup>

### Legal Status

There is currently a large body of legislation on the trade of hazardous waste. The Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal, ratified in 1989, is the single

\* Stanford University, USA. Working within the Group on Environment and Growth in Developing Countries.

most important piece of legislation. Recognizing the need for international law regulating trade in hazardous waste, the Basel Convention was initiated by the United Nations Environment Programme (UNEP).<sup>13</sup>

The Convention was originally drafted with the objectives of minimizing hazardous waste generation, reducing movement of waste, and establishing a protocol for trade. It requires that exporters obtain prior informed consent (PIC) of the designated "competent authority" in the country of import, and that that country should have the capability to treat and dispose of the hazardous materials by "environmentally sound management" practices.<sup>14</sup>

Today, 158 nations have ratified the Basel Convention. All of the countries of the European Union (EU), and most developing countries, have signed on to the mandates of the Convention. The United States, the largest producer of hazardous waste in the world, has never officially ratified it and thus is not bound by law to abide by the legislation.<sup>15</sup>

While the Basel Convention was a beneficial and necessary step in international hazardous waste law, there are several problems that have rendered it less successful than initially hoped. Some parties have called the Convention a legitimization of "waste colonialism", since it does not expressly prohibit countries from dumping waste abroad. Rather, the original Convention merely serves to monitor the transactions of the waste trade and establish basic rules. This distinction is significant because many parties fought for an absolute ban on trade from rich to poor countries, but a few powerful developed countries (namely the US) successfully defeated such ideas.<sup>16</sup> Perhaps the most important loophole in the Basel regulations is the provision allowing for waste importation for the purposes of "recycling". Almost any type of hazardous waste can be labelled as recyclable, and as such is considered a product, thus falling outside of Basel legislation.<sup>17</sup> These loopholes, in addition to the failings of the PIC system, which has been called a "paperwork regime", considerably weaken the Basel Convention. The Basel Ban Amendment, which would have effectively closed the recycling loophole and strengthened the legislation considerably, has not yet been ratified by most countries and is not legally binding today.<sup>18</sup> The Basel Convention provides a basic framework for implementing international hazardous waste law, but is inadequate and weakly enforced; its current deficiencies are primarily a result of opposition from wealthy nations and the failure of the Basel Ban Amendment to be ratified.

### The Shipbreaking Industry

Before 1997, when Greenpeace launched a massive awareness and resistance campaign, most Westerners had

never heard of the shipbreaking industry. It is a relatively small industry located in a remote corner of the world, seemingly of no major concern. But as Greenpeace successfully exposed, the shipbreaking industry is characterized by toxic dumping practices and severe human rights violations. Interestingly enough, this industry exists primarily as a result of Western economic agendas. I will use the shipbreaking industry as a case study of the effects of international trade in hazardous waste.

The practice of shipbreaking (or scrapping) refers to the systematic dismantling of end-of-life ocean vessels. Of the world fleet of about 45,000 ocean-going vessels, each year 600–700 ships reach the end of their productive lives (usually 25–30 years), and consequently must be scrapped.<sup>19</sup> Every year, the number of ships ready for scrap rises as the ship "baby boom" of the 1970s reaches old age.<sup>20</sup> Also, due to accidents and safety concerns, the International Maritime Organization (IMO) began phasing out all single-hull tankers in 2000, considerably increasing the global fleet of ships ready to be scrapped each year.<sup>21</sup>

In the 1970s, shipbreaking was performed at shipyard dry-dock facilities in the industrialized countries of Western Europe and North America, where the process was highly mechanized and closely regulated because of the potentially hazardous nature of the work. But as environmental and labour regulations became more stringent in the 1980s and early 1990s, the costs of shipbreaking in industrialized nations increased and shipowners began to

look for alternate places to send their ships for scrap.<sup>22</sup> Relatively quickly, South Asia emerged as the number one destination for old ships due to easy marine access, high demand for scrap steel, and willingness to accept ships without prior cleaning and detoxification records.<sup>23</sup> Today, most Western ships are scrapped in India, Pakistan and Bangladesh. India alone scraps nearly 70 per cent of the world's end-of-life vessels every year.<sup>24</sup> The beaches at Alang, India are the final resting place of 60 per cent of the world's vessels, and the site of the original Greenpeace investigation

in 1998.<sup>25</sup> Alang represents perhaps the most extensively studied shipbreaking yard and certainly the largest and most dangerous one; it is also home to more than 40,000 shipbreaking workers.<sup>26</sup> The shipyards of Chittagong in Bangladesh tend to break fewer, but larger, ships.<sup>27</sup>

### Economics

The average ship is sold to a shipbreaking company for US\$2 million (\$120–\$185 per tonne); about 95 per cent of a ship's weight is recoverable steel, which the shipyard can then re-sell domestically and recover a profit.<sup>28</sup> In aggregate, the shipping industry earns over US\$1 billion annually by selling its end-of-life vessels for scrap in



Shipbreaking takes place in poor countries, where once pretty beaches in India, Bangladesh, Pakistan and Turkey are turned into ship graveyards  
Courtesy: Greenpeace

South Asia.<sup>29</sup> This is a very profitable arrangement, considering that before the South Asian market existed, shipping companies usually incurred a net cost for the disposal of their ships. Intuitively, it makes sense that companies must pay for disposal of their waste; the difference now is that steel “waste” is a valuable commodity in many newly industrializing nations of South Asia. The traditional “polluter pays” principle has been turned on its head; in this case, polluters are paid for dumping because the waste they dump has a recovery value.<sup>30</sup> However, it is important to note that recycling scrap steel is unquestionably a better option than simple disposal.

Besides the enormous profits to shipping companies, the shipbreaking industry provides jobs and raw materials to the impoverished nations of South Asia. It is estimated that the industry directly employs over 100,000 workers,<sup>31</sup> and countless more are indirectly involved in the economies of shipyard communities. One analyst has estimated that 200,000 Bangladeshis and 500,000 Indians indirectly benefit from the economic inputs of shipbreaking yards.<sup>32</sup> This is due not only to the recovered steel, but also to other parts of the ship which have a market value in developing countries, including bathtubs, toilets, furniture, generators and boilers.<sup>33</sup> Certainly, however, scrap steel is the most valuable raw material; shipbreaking satisfies 15 per cent of India’s steel needs<sup>34</sup> and an astonishing 80 per cent of those in Bangladesh.<sup>35</sup>

As the shipbreaking industry is such a boon to South Asian economies, there is intense competition between nations to attract ships for scrap. In an attempt to differentiate market niches, each of the countries specializes in breaking different types of ships. The most important difference in this regard is that Bangladesh will accept contaminated oil tankers for scrapping purposes without the usual “gas-free-for-hot-works”<sup>36</sup> certification. These types of tankers pose the greatest risk to shipyard workers due to explosions. As Bangladesh is the only country that does not require “gas-free-for-hot-works” certification for tankers, it has a comparative advantage in attracting these ships for scrap.<sup>37</sup> Shipowners naturally choose to scrap tankers in Bangladesh because they are not required to detoxify or obtain safety certifications prior to sale; in doing so, they save about US\$2 per ton.<sup>38</sup>

### Legal Status in India

On paper, India was a model for the developing world in establishment of regulations governing hazardous waste management; these early regulations were largely a result of the Bhopal disaster in 1984.<sup>39</sup> India’s Hazardous Waste Management Rules (HWM) are part of the Environmental Protection Act of 1989 and were amended in 2000 and 2002 in order to widen the definition of hazardous waste and harmonize the list of wastes with that of the Basel

Convention.<sup>40</sup> Notably, the Rules prohibited imports of hazardous waste for dumping and disposal, but allowed imports for recycling until the January 2000 amendment. A large quantity of hazardous waste entered India through the “recycling” loophole through 1997 when the Indian Supreme Court took the dramatic action of placing a full ban on imports of hazardous waste (as defined by the Basel Convention).<sup>41</sup> For the shipbreaking industry, this means that the import of ships containing hazardous waste materials is illegal. As of 2003, implementation of the Hazardous Waste Management Rules continues to be very poor.<sup>42</sup>

The practice of shipbreaking in South Asia, which almost exclusively represents trade from OECD to non-OECD countries, is at best difficult to reconcile with the objectives of the Basel Convention (to which India is a party). However, it is not expressly prohibited for several reasons. First, Basel only applies to trade in hazardous waste, and while the vast majority of old ships do contain hazardous material, some shipowners decontaminate ships prior to sale. Second, since the Basel Ban Amendment has not officially entered into force, India is not legally bound under international law to abide by the prohibition of imports for “recycling” even though it has ratified the Amendment. According to Greenpeace, there are currently no known shipbreaking operations in non-OECD countries that meet the “environmentally sound management” criteria as defined by the Basel Convention.<sup>43</sup>

While India is subject to both national and international laws that either prohibit or strongly restrict the import of hazardous wastes, these laws have little effect

on the shipbreaking industry, which operates almost independently of regulation. This is not due to the fact that the hazardous waste laws do not apply, but rather due to vague legislation, inadequate enforcement and lack of economic incentives.

### Environmental Problems

The diverse problems and challenges posed by the shipbreaking industry are representative of the problems of the global hazardous waste trade as a whole. This type of trade can be very deleterious to the citizens and the environment of the importing country. In order to get a general idea of the nature of the problems related to shipbreaking, one need only remember why it is so much more profitable to dismantle old ships in developing nations: weak environmental standards and cheap labour. In the case of India, we have seen that it is not a lack of, but rather poor enforcement of, extant environmental regulations that is the crucial problem of environmental protection.

Shipbreaking along the inter-tidal zones of Indian beaches introduces a terrific quantity and variety of haz-



In China shipbreaking looks less dramatic than on Indian or Bangladeshi beaches. Vessels are broken up in docks with more cranes and machinery. But in fact the working conditions are similar in shipbreaking yards all over Asia

Courtesy: Greenpeace



ardous materials into environmentally fragile coastal ecosystems.<sup>44</sup> The ocean, soils and nearby waterways end up polluted with toxic chemicals and oily wastes; this pollution not only devastates local fisheries, but it also enters groundwater aquifers and can eventually threaten drinking water supplies.<sup>45</sup> Heavy metals are particularly phytotoxic and can decrease soil productivity. Most shipyards are so contaminated that the soil itself is considered hazardous waste.<sup>46</sup> Acidic and alkaline wastes decrease the natural buffering capacity of surface waters and soils, adversely affecting the entire ecosystem and decreasing species diversity. One gallon of oil can leave one million gallons of water non-potable, and marine species are sensitive to oil concentrations as low as one part per million.<sup>47</sup>

The negative impact of the shipbreaking industry on local fisheries merits further attention. Oily and metallic wastes from ship ballast water are a primary source of water contamination leading to decreased fish populations.<sup>48</sup> In addition, ballast water contains marine species from the port of origin of the ship, which, when released on the beaches of South Asia, often become invasive, out-competing native species for nutrients and habitat.<sup>49</sup> According to Baba Nikunga Das, president of the Latifpur village committee in Chittagong, Bangladesh, "As a traditional fisherman, the life of my family, and the lives of five hundred families I represent, depend on fishing activities. Fishing has declined in the last couple of years due to water pollution caused mostly by the shipbreaking operations in the nearby area. Waste oils and hazardous substances ... affect the fish stocks and the quality of the fish catch and affect the livelihood of fisherfolks. ... Many species like the chandana illish (a species of the famous Hilsa fish of the Bay of Bengal) have disappeared".<sup>50</sup> Although the precise cost of the shipbreaking industry to fisheries is unknown, it is clearly significant in terms of loss of livelihood for subsistence fishing communities and damage to marine ecosystems.

### Health Effects

Environmental degradation as a result of shipbreaking is a serious problem, but perhaps more immediate is the problem of worker safety and health. There are no official statistics on the risks experienced by shipbreaking workers, but anecdotal evidence suggests that the shipbreaking industry in South Asia is one of the most dangerous professions in the world.<sup>51</sup> Greenpeace alleges that at least twenty-five workers died and fifty others were injured at the Alang shipyard alone in the first six months of 2003.<sup>52</sup> Other estimates have put the worker toll at one shipyard death per day.<sup>53</sup> Because most workers are poor migrants who tend to be socially "invisible", many deaths go unre-

ported. Deaths are most commonly due to explosions, fires, suffocation and falling steel.<sup>54</sup>

In addition to accidents, exposure to hazardous chemicals puts the health of the workers at risk. German occupational physician Dr Frank Hittman has estimated that one out of every four Alang workers will contract cancer as a result of workplace exposure to toxic materials. The most hazardous compounds that workers encounter are asbestos, lead, organotin compounds, dioxins and Polycyclic Aromatic Hydrocarbons (PAHs). Most of these are

either residues left on the ships or paint degradation products. In addition, the burning of oily wastes on the beaches reduces air quality, leading to respiratory problems in shipbreaking communities. Many of these toxic compounds are persistent and bioaccumulative, so workers may not experience deleterious health effects until years later.<sup>55</sup> Moreover, workers are given no information about exposure to hazardous materials and the associated health risks.<sup>56</sup>

Living conditions for shipyard workers present health hazards as well. Since most workers are poor migrants from rural regions, they

live in temporary shantytowns adjacent to the beaches where they work. They work in shifts around the clock and are exposed to toxic fumes and asbestos dust while they sleep.<sup>57</sup> There are no sanitation facilities and only primitive, often contaminated, water sources. Medical and emergency services are generally unavailable or located very far away. Shipbreaking workers are paid US\$1–\$2 per day, and they are not generally allowed to organize into unions to try to improve their conditions.<sup>58</sup>

Professor Zada Lipman, a scholar of Environmental Justice issues at Macquarie University in Australia, describes the impact of the shipbreaking industry: "While recovery of secondary materials and their reintegration into the global economy can reduce the demand for virgin resources, it poses a serious threat to the environment and human health in those countries who do not have the capacity to handle these wastes in an environmentally sound manner".<sup>59</sup> The plight of shipbreaking workers is dismal, but ultimately they are willing to accept the extreme risks involved because they are so desperate for any work available.

### Shipbreaking Solutions

The shipbreaking industry is not going to disappear any time soon, nor is it going to shift back to operations in Western countries that are safer and more mechanized. Thus, it is critical to design solutions and improvements that take into account the economic realities of the South Asian countries. International Labour Organization (ILO) analyst Paul Bailey argues that: "Shipbreaking on the beaches in Asian countries ... represents the downside of globalization. After industrialized countries of the West-



Asbestos litters the Chittagong yard. High concentrations of oil were found in water and sediments. Soil samples show high levels of toxic substances such as heavy metals, Polychlorinated Biphenyls (PCBs) and Tributyl Tin (TBT). Most fisher folks in the region were forced to change their profession. They migrated or found jobs in and around the shipbreaking yard

Courtesy: Greenpeace

ern world are through using their ships, they get scrapped on beaches without dry-dock facilities or safety measures for workers. The challenge facing us is how this can be done in a safer manner<sup>57, 60</sup>

Greenpeace has drafted its own guidelines to improve the environmental, health and labour conditions of the shipbreaking industry. While they are not comprehensive, they do provide a framework from which shipowners can begin to effect positive changes:

- Shipowners should provide a detailed inventory of hazardous materials present on their ships before export;
- Shipowners should detoxify hazardous materials before export in accordance with Basel guidelines and should be required to obtain "gas-free-for-hot-works" certification;
- Shipowners should disclose the selected shipbreaking site and assessment done to ascertain that "environmentally sound management" practices will be followed;
- Shipowners should ensure extensive consultations with the shipbreaking company on the shipbreaking plan and monitoring agenda; and
- Shipyards should allow public access to shipbreaking facilities for safety and health monitoring and inspection.<sup>61</sup>

As these guidelines suggest, the international community must decide who is responsible for the safety, health and environmental problems of the shipbreaking industry. Most legal experts agree shipowners must be held liable for the ships they export. Certainly, importing countries should enforce their own legislation, but in the end shipowners and exporters should be responsible for any violations of international and national laws and damages resulting from these violations.

Shipowners will not amend their practices until they face consequences under international law. Exporters will continue the "race to the bottom", unless strict legislation applying equally to all shipbreaking countries levels the playing field. If the market is to work effectively, without forcing importing countries to internalize the environmental and health costs of shipbreaking, every country must enforce the same basic standards.

Ideally, a coalition including members from the Basel Secretariat, the IMO and the ILO should draft joint guidelines on safer, cleaner ways to dismantle decommissioned ships around the world. Those guidelines could then be incorporated into the text of the Basel Convention and would be legally binding to Basel Parties upon ratification. New legislation must take into account the realities of both sides; exporting companies need to dispose of old ships and make a profit, and importing countries need cash in order to promote economic development. There must be appropriate incentives for compliance on both ends.

In addition to stronger international legislation and enforcement on the hazardous waste trade, there needs to be increasing emphasis on reduction of the generation of hazardous waste and development of clean technology in the shipping industry.

## NGO Activism

Non-governmental organizations (NGOs) have been very active in exposing the dangers of the shipbreaking industry in South Asia. Since 1997, Greenpeace has been working to expose the crimes being committed by industrialized nations in sending their ships to be scrapped in India, Bangladesh and Pakistan. While the environmental organization has often been accused of being alarmist and relying on emotion rather than science, its coverage of the shipbreaking controversy has been fact-based and relatively balanced. Greenpeace can be credited with single-handedly bringing the shipbreaking industry to the attention of international media and forcing the accountability of shipowners, albeit sometimes through overly dramatic stunts. Greenpeace recently blocked the Norwegian tanker *Hesperus* from being dismantled at Alang after accusing the owner of failing to comply with international law and knowingly selling the ship for scrap without removing hazardous materials.<sup>62</sup> It is an unfortunate but telling reality that the Indian government only enforced its own hazardous waste import laws when CNN broadcast footage of Greenpeace protestors surrounding a ship approaching the beaches of Alang. While NGO participation has been beneficial in bringing to light the problems of the shipbreaking industry, it should not be relied upon as a mechanism of enforcement in the future.



Cables from the ships are illegally burnt in the early morning. When burnt, highly dangerous fumes like dioxins and furans are released. Dioxins are the most toxic substances humans have ever released into the environment

Courtesy: Greenpeace

## Conclusions

The practice of shipbreaking in developing nations, and the international hazardous waste trade in general, represent a fundamental challenge to free market ideology. If Adam Smith's "invisible hand" guides ships toward the beaches of South Asia, and in doing so degrades the environment and endangers workers, then we need to re-examine the idea that globalization and unrestrained market capitalism benefit everyone. Perhaps if all countries started from the same basic legal and political tenets, free trade could in fact be free, but also fair. However, this is not the case, and so legislation restricting trade in hazardous waste is necessary in order to reduce distortions caused by external costs, so that the market can operate in an efficient but also environmentally just manner. Ultimately, shipbreaking must be seen not as a profitable market for exporters but rather as an industry that performs a valuable service;<sup>63</sup> the economics of the industry must shift accordingly to reflect this new logic. One possible result of increased restriction on hazardous waste

trade is the additional incentive to dump waste illegally, thereby avoiding the nuisance of the legal system altogether;<sup>64</sup> this is an issue of concern and must be addressed by new legislation.

As long as there is global inequality, leading to different environmental and human rights standards between nations, there remains the risk that developed nations will be able to successfully use trade as a tool to eliminate problem industries, thus transferring the burden to the developing world. Stringent international legislation backed by strong enforcement is the only way to avoid such a displacement. Legislation must address the need to restrict trade in hazardous waste, but ultimately must go one step further and focus on the global imperative to minimize primary generation of waste. It is a political and moral exigency to actively promote the implementation of stronger global hazardous waste legislation.

It is true that the global hazardous waste trade is relatively small, and certainly shipbreaking represents only a small fraction of it. But I argue that the industry is symbolic in demonstrating the limitations and vicissitudes of the current free market economy, as well as exposing the environmental and social justice abuses associated with globalization and trade liberalization policies around the world.

#### Notes:

- <sup>1</sup> "Let them eat pollution", *The Economist*, 8 Feb. 1992, p. 66.
- <sup>2</sup> Puckett, Jim. "The Basel Ban: A Triumph Over Business-As-Usual", Basel Action Network, 1 Oct. 1997, p. 1.
- <sup>3</sup> Kelly, Tom. "Toxic Exports: the international waste trade", *Green Left*, 1994, p. 1.
- <sup>4</sup> Rauscher, Michael. "International Trade in Toxic Waste", University of Rostock Institute for Economics, Working Paper #19, 1999, p. 3.
- <sup>5</sup> The units of measurement "ton" and "tonne" can cause significant confusion, and further statistics will include the use of both. A US ton equals 2000 pounds, while a metric tonne equals 1000 kilograms, or about 2240 pounds.
- <sup>6</sup> Kelly, supra 3, at 1.
- <sup>7</sup> Id, at 1.
- <sup>8</sup> Id, at 1.
- <sup>9</sup> Ajello, Robin, and Arjuna, Ranawana, "Death in Slow Motion", *Asiaweek*, Sept. 20, 1996, p. 1.
- <sup>10</sup> "Pollution and the poor: why 'clean development' at any price is a curse on the third world", *The Economist*, 15 Feb. 1992, p. 18.
- <sup>11</sup> Rauscher, supra n. 4, at 3-4.
- <sup>12</sup> Lipman, Zada. "Trade in Hazardous Waste: Environmental Justice Versus Economic Growth", supra n. 8, at 4.
- <sup>13</sup> "Welcome to Basel Convention", Secretariat of the Basel Convention, UNEP, 2003, p. 1.
- <sup>14</sup> Id, at 4-5.
- <sup>15</sup> "Status of Ratifications", Secretariat of the Basel Convention, UNEP, 2003, p. 4.
- <sup>16</sup> Puckett, supra n. 2, at 4.
- <sup>17</sup> Id, at 6.
- <sup>18</sup> "Status of Ratifications", supra n. 15, at 5.
- <sup>19</sup> "Shipbreaking: A Global Environmental, Health, and Labour Challenge: A Greenpeace Report for IMO MPEC 44th Session", Greenpeace, March 2000, p. 2.
- <sup>20</sup> Göhre, Sanja. "Globalization's Downside", ILO World of Work, no. 37, Dec. 2000, p. 4.
- <sup>21</sup> "What is Shipbreaking?", Greenpeace Web, 2003, p. 1.
- <sup>22</sup> "Steel and Toxic Wastes for Asia: the health and environmental hazards for recipient states", Greenpeace, 1999, p. 6.
- <sup>23</sup> "Shipbreaking: A Global Environmental, Health and Labour Challenge", supra n. 19, at 2.
- <sup>24</sup> Id, at 2.
- <sup>25</sup> Dhar, Aarti. "Ship Owners Must Bear Liability", *The Hindu*, on *Lexis-Nexis*, 13 July 2003, p. 1.
- <sup>26</sup> "Steel and Toxic Wastes for Asia", supra n. 22, at 13.
- <sup>27</sup> Dhar, supra n. 25, at 1.

- <sup>28</sup> Göhre, supra n. 20, at 1, and "Shipbreaking: A Global Environmental, Health and Labour Challenge", supra n. 30, at 2.
- <sup>29</sup> "The Continuous Evasion of the 'Polluter Pays' Principle", Greenpeace, Sept. 2002, p. 2.
- <sup>30</sup> Id, at 7.
- <sup>31</sup> "Shipbreaking: A Global Environmental, Health, and Labour Challenge", supra n. 20, at 2.
- <sup>32</sup> Göhre, supra n. 20, at 2.
- <sup>33</sup> Id, at 2.
- <sup>34</sup> "Steel and Toxic Wastes for Asia", supra n. 22, at 25.
- <sup>35</sup> Göhre, supra n. 20, at 1.
- <sup>36</sup> "Gas-free-for-hot-works" is a safety certification usually required of ships, especially tankers, prior to dismantling. It designates that the ship is devoid of all volatile materials per national law, and is meant to reduce the risk of explosions during the process of high-temperature steel cutting.
- <sup>37</sup> "Shipbreaking: A Global Environmental, Health, and Labour Challenge", supra n. 19, at 4.
- <sup>38</sup> "Where are they Scrapped?", Greenpeace Web, 2003, at 1.
- <sup>39</sup> Agarwal, Ravi. "India: the world's final dumpyard", *Basel Action News*, v. 1, no. 1 Jan. 1998, p. 1.
- <sup>40</sup> "Hazardous Waste Management in India: A Policy Discussion Forum Base Paper", The Environmental Resources Institute (TERI), 2003, p. 10.
- <sup>41</sup> Rosencranz and Divan, "Regulation of Hazardous Substances", *Environmental Policy and Law in India*, 2000, p. 515.
- <sup>42</sup> "Hazardous Waste Management in India", supra n. 40, at 2.
- <sup>43</sup> "Shipbreaking: A Global Environmental, Health and Labour Challenge", supra n. 19, at 7.
- <sup>44</sup> Hazardous Waste Management in India, supra n. 40, at 8, and "Steel and Toxic Wastes for Asia", supra n. 23, at 20.
- <sup>45</sup> "Hazardous Waste Management in India", supra n. 40, at 8.
- <sup>46</sup> "Steel and Toxic Wastes for Asia", supra n. 22, at 17.
- <sup>47</sup> "Hazardous Waste Management in India", supra n. 40, at 8.
- <sup>48</sup> "Continuous Evasion of the 'Polluter Pays' Principle", supra n. 29, at 4.
- <sup>49</sup> "Problems of Shipbreaking", Greenpeace Web, 2003, at 1.
- <sup>50</sup> "Continuous Evasion of the 'Polluter Pays' Principle", supra n. 29, at 4.
- <sup>51</sup> "Shipbreaking: A Global Environmental, Health, and Labour Challenge", supra n. 19, at 4.
- <sup>52</sup> "Workers Die in Ship's Graveyard, Says Greenpeace", *The Times of India*, on *Lexis-Nexis*, 14 July 2003, p. 1.
- <sup>53</sup> Agarwal, supra n. 39, at 2.
- <sup>54</sup> "Shipbreaking: A Global Environmental, Health, and Labour Challenge", supra n. 19, at 5.
- <sup>55</sup> "The Continuous Evasion of the 'Polluter Pays' Principle", supra n. 29, at 3.
- <sup>56</sup> "Shipbreaking: A Global Environmental, Health, and Labour Challenge", supra n. 19, at 5.
- <sup>57</sup> "Steel and Toxic Waste for Asia", supra n. 22, at 13.
- <sup>58</sup> Göhre, supra n. 20, at 3.
- <sup>59</sup> Lipman, supra n. 8, at 1.
- <sup>60</sup> Göhre, supra n. 20, at 2.
- <sup>61</sup> "Shipbreaking: A Global Environmental, Health, and Labour Challenge", supra n. 19, at 8.
- <sup>62</sup> Nadkarni, Shirish. "Hesperus barred from Alang after Greenpeace alert", *Lloyd's List*, on *Lexis-Nexis*, 1 Oct. 2003, p. 5.
- <sup>63</sup> "Continuous Evasion of the 'Polluter Pays' Principle", supra n. 29, at 7.
- <sup>64</sup> Rauscher, supra n. 4, at 22.



The majority of ships scrapped on Pakistani beaches are oil tankers. Pakistani breakers specialise in large tonnage vessels. In 1999 the country was the third largest shipbreaking nation but recent years have seen a decline in the industry in the area  
 Courtesy: Greenpeace