

**THE HARD REALITY OF BREAKING UP: THE GLOBAL
TRANSBOUNDARY MOVEMENT OF OCEAN VESSEL
DEMOLITION AND WASTE**

Holly H. Hillyer

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INTRODUCTION

More than 80% of international trade in goods by volume is transported by ships.¹ In 1960, the global inventory of ocean-going vessels was about 15,000, and, by 2008, that number had soared to more than 97,000.² These vessels include oil tankers, bulk carriers, general cargo carriers, container ships, and passenger vessels.³

Like everything in today's society, once a vessel is no longer useful or repairable, it is sent off to the local junkyard.⁴ But what or where is the

1. Federico Demaria, *Shipbreaking at Alang-Sosiya (India): An Ecological Distribution Conflict*, 70 *ECOLOGICAL ECON.* 250, 250 (2010).

2. *Id.* at 251.

3. *Id.* at 250.

4. *See id.* (discussing how ships are often demolished in developing countries).

local junkyard for ocean-going vessels? What does one do with an old ship? The answer to these questions is most likely a quiet bay with a shallow sandy beach in a developing country for “shipbreaking,” a process in which a ship is dismantled into its valued components.⁵

A typical ship can provide tons of steel and iron, useful heavy equipment such as cranes and winches, or electronic equipment—all of which are potentially valued commodities. However, there are also a myriad of other less desirable “waste” materials generated during the dismantling process. These include hazardous wastes such as toxic paints, asbestos, polychlorinated organic compounds (PCBs), lead and mercury, radioactive wastes, electronic wastes, and trash such as furniture, wood, and plastics.⁶

While most of the western world has strict regulations on the management of the shipbreaking process to ensure proper handling of the waste materials generated, most developing countries lack or fail to adequately enforce such regulations.⁷ The reasons for this disparity vary; however, the most common reason is the developing country’s need for the resources and economic value from the materials yielded by the ships.⁸ Unfortunately, the real costs for the lack of effective regulations are borne by the cheap local labor, uninformed communities, and the environment.⁹

This paper will address the growing issue of shipbreaking, its impacts on developing nations and the global environment, and the critical need for improved international laws.

I. IS IT SHIP RECYCLING OR SHIPBREAKING: WHAT’S IN A NAME?

Almost every part of a ship can be reused or recycled in theory, which would make *ship recycling* the accurate term for the dismantling process. Hence, ship recycling should be a vital element in any sustainable development strategy, since it provides employment, raw materials, and economic benefits.¹⁰ In 2007, even the Baltic and International Maritime Council (BIMCO), one of the world’s largest private shipping non-governmental organizations, stated that ship recycling is a green industry

5. *Id.*

6. Demaria *supra* note 1, at 253.

7. *See id.* at 250 (describing lack of enforcement in India).

8. *Id.*

9. *Id.*

10. TONY GEORGE PUTHUCHERRIL, FROM SHIPBREAKING TO SUSTAINABLE SHIP RECYCLING, EVOLUTION OF A LEGAL REGIME 15 (2010).

and the most environmentally friendly process of disposing of ships, if managed properly.¹¹

It is this last proviso—if managed properly—that has proven to be the challenge. Starting with the ship building process, the construction of ships does not take into account the final dismantling procedure.¹² Hence, a toxic cocktail of hazardous, carcinogenic, or environmentally harmful materials have often been used in the construction of these vessels, especially those built between the 1960s and the 1980s.¹³ It is these materials that make ship recycling problematic and raise the question of whether the process is truly ship recycling or simply shipbreaking. By and far, the ability to separate the desired resources from the hazardous elements has proven to be a challenge because the segregation is very labor intensive and can be dangerous or unsafe for workers.¹⁴ Consequently, most ships are broken down into their usable components only, leaving the hazardous materials to take care of themselves—resulting in releases of these materials into the environment and exposure to the workers and the host communities.¹⁵ Thus, in most developing countries, the process is better labeled shipbreaking, since it is strictly the act by which a ship is rendered into its reusable components.

II. THE SHIPBREAKING PROCESS

Shipbreaking is the process of dismantling an obsolete ocean-going vessel for scrap and reusable parts, while disposing of the remaining unwanted materials.¹⁶ The process is currently performed using one of two approaches—the dry dock method or the beaching method.¹⁷ The dry dock method is the primary process by which most western countries scrap sea vessels. It involves hoisting the ship into a dry dock or controlled quayside facility where any pollutants can be captured and contained.¹⁸ Once the ship is docked, it is broken into large pieces that are then sent to other areas for further processing.¹⁹ The beaching method is used throughout the

11. *Id.* at 21.

12. *Id.* at 15.

13. *Id.*

14. *See id.* (indicating that asbestos, for example, poses a health risk for ship recyclers).

15. *See id.* at 29–38 (describing the shipbreaking process in several developing countries).

16. *Id.* at 1.

17. Duncan Graham-Rowe, *Breaking Up is Hard to Do*, 429 NATURE 800, 800 (2004).

18. Madhur Singh, *Maritime Affairs: South Asian Shipbreakers Plan Joint Effort to Oppose International Recycling Convention*, 42 DAILY ENV'T REP. A-4 (2010); Graham-Rowe, *supra* note 17 at 800.

19. *Id.*

developing world, most extensively in India and Asia.²⁰ This process involves literally beaching the vessel under its own power at high tide.²¹ As the tide recedes, the ship is laid down on its flat bottom on the exposed beach and then the manual process of demolition begins.²² Either process includes a wide range of activities, from removing the machinery and gutting the ship, to the final cutting down of the actual structure of the vessel.²³

The shipbreaking process was first developed in the United States (US), Great Britain, and Japan following World War II in response to the urgent need for steel for the booming post-war economy and as a way to recycle the large volume of war-damaged ships now requiring disposal.²⁴ Over the following decades, global shipping volume increased from 15,000 ships existing globally in 1960 to more than 97,000 in 2008, which, in turn, fueled significant growth in the demand for shipbreaking.²⁵ The types of vessels sent for demolition vary from oil tankers, bulk carriers, general cargo, and container ships to passenger ships.²⁶ Additionally, during this current time of economic recession and international trade stagnation, there is an overcapacity in the freight market and, therefore, more ships are sent to the scrap yard.²⁷

The trend to dismantle ships abroad does not appear to be abating; in fact, there is currently an increasing number of ships which will be destined for the world's shipbreaking yards.²⁸ In April 2001, the International Maritime Organization (IMO) and the European Union (EU) promulgated regulations requiring all single-hulled tankers to be retrofitted or replaced with ships containing two hulls by 2015.²⁹ However, this original timeline was accelerated following the destruction of a single-hull oil tanker off the

20. Graham-Rowe, *supra* note 17, at 801.

21. Demaria, *supra* note 1, at 252.

22. *Id.*

23. *Id.* at 252–53.

24. *Id.* at 252.

25. *Id.* at 251.

26. *Id.* at 250.

27. Katrine Vetaas Vedeler, *From Cradle to Grave—Value Chain Responsibility in the Ship Scrapping Industry* 21 (Spring, 2006) (unpublished master's thesis, Norwegian School of Economics and Business Administration), available at http://brage.bibsys.no/nhh/handle/URN:NBN:no-bibsys_brage_22108.

28. Graham-Rowe, *supra* note 17, at 801.

29. *Id.* at 800.

shore of Spain in 2002³⁰. Since that disastrous event, some vessel types have been required to begin the replacement process as early as 2005.³¹

Today, companies sell their unwanted ships at the best price for dismantling through brokers operating in cities such as London, Dubai, Singapore, and Hamburg.³² Sea vessels are sold by the ton at a price ranging from 100 to 400 U.S. dollars, depending on the markets for the component materials and the type of vessel.³³ The developing nations in South Asia's shipyards are the main destination for demolition.³⁴ In 2009, of the 1,006 vessels sent for demolition, 435 were sent to India (43%), 214 to Bangladesh (21%), 173 to China (17%), 87 to Pakistan (9%), and 42 to Turkey (4%), leaving 6% for the remaining shipyards.³⁵

Alang-Sosiya Ship Breaking Yard (ASSBY) in India and Chittagong in Bangladesh are the world's biggest shipbreaking/recycling yards, with China in close pursuit.³⁶ Ships arrive at these shipyards mostly from Europe, Japan, and North America.³⁷

III. WHO ARE THE PLAYERS IN THE SHIPBREAKING BUSINESS?

A. The Developed Countries: United States, European Union, Turkey, and the Organization for Economic Co-operation and Development (OECD)

30 industrialized countries comprise and are committed to the principles of the OECD, including some of the former leading shipbreakers from Europe and Asia.³⁸ Belgium, Italy, Britain, Spain, Denmark, the Netherlands, the U.S., and Canada maintain "green" recycling facilities.³⁹ The EU deconstructs approximately 25 to 50 ships per year, with Belgium, Italy, and the Netherlands being the largest ship-dismantling yards, combined with a multitude of other smaller facilities located in the EU.⁴⁰ In

30. *Id.*

31. *Id.*

32. Demaria, *supra* note 1, at 252.

33. *Id.*

34. *Id.*

35. *Id.*

36. *Id.* at 254.

37. *Id.*

38. PUTHUCHERRIL, *supra* note 10, at 40.

39. *Id.* at 40–41.

40. *Economics of End-of-Life Ships*, IMOWATCH (May 28, 2011), <http://imowatch.blogspot.com/2011/05/economics-of-end-of-life-ships.html>.

addition, Turkey has 20 shipbreaking yards on the shores of Aliaga, which have the capacity to dismantle 100 ships per year.⁴¹

However, despite all the regulatory framework and “green” ship recycling facilities located within the OECD, the fact remains that OECD countries are the primary exporters of toxic ships to China and the Indian subcontinent.⁴² Turkey and OECD countries have struggled in attracting obsolete ships for dismantling because the cost of regulatory oversight reduces the ability of these facilities to offer the attractive scrap metal prices that the Indian subcontinent can offer.⁴³ Consequently, Turkey, the U.S., and the OECD countries have become an unattractive option for ship demolition.⁴⁴

B. The Developing Countries: Bangladesh, Pakistan, India, and China

1. Bangladesh

Bangladesh relies on the dismantling of ships as its only source of iron ore resources in the country; shipbreaking provides approximately 80% of the country’s steel needs.⁴⁵ The center of the Bangladesh shipbreaking industry lies in the Sitakund area of Chittagong, which has 30 shipbreaking yards.⁴⁶ In December of 2010, the World Bank reported widespread contamination of Chittagong’s beaches with lead, mercury, and oil.⁴⁷

2. Pakistan

Pakistan appears to be the first country in the Asian continent to begin dismantling ships without a complementarily established ship building industry.⁴⁸ However, even though Pakistan’s shipyards maintain the cheapest labor force in Asia, the shipbreaking industry is declining due to rising scrap metal prices and high import duties imposed by Pakistan.⁴⁹

41. *Id.*

42. PUTHUCHERRIL, *supra* note 10, at 41.

43. *Id.* at 43.

44. *See id.* (asserting that member countries of the OECD are generally unattractive options for ship recycling).

45. *Id.* at 28.

46. *Id.*

47. MARIA SARRAF ET AL., THE WORLD BANK, SHIP BREAKING AND RECYCLING INDUSTRY IN BANGLADESH AND PAKISTAN 5 (2010).

48. PUTHUCHERRIL, *supra* note 10, at 29.

49. *Id.* at 30.

3. India

India's shipbreaking industry is a leader in the developing world. India's largest shipyard, Alang-Sosiya, has, at times, employed approximately 35,000 workers and dismantled about one ship per day.⁵⁰

4. China

In 1993, almost half of all sea vessels were scrapped on the beaches of China.⁵¹ However, China's industry was soon eclipsed by other countries in the Asian subcontinent.⁵² Even though China's shipbreaking practices are considered superior to the rest of Asia as a significantly green recycling process,⁵³ this notoriety has done little to bolster China's shipbreaking business.

IV. ALANG-SOSIYA SHIP BREAKING YARD: A LOOK AT THE SHIPBREAKING YARD

ASSBY presents a classic case for the study of the shipbreaking process and serves as a striking example of the issues of shipbreaking. At one time synonymous with shipbreaking, ASSBY is capable of employing approximately 35,000 workers, breaking almost one ship per day.⁵⁴ The shipyard is located on ten kilometers of Indian coastline on the western coast of the Gulf of Cambay in the Arabian Sea.⁵⁵ This shipyard exclusively employs the shipbreaking beaching method.⁵⁶ The workers typically use simple Liquid Propane Gas and oxygen torches to cut the ship into pieces, along with their bare hands.⁵⁷ The entire dismantling process takes place directly on the beach in designated lots.⁵⁸ In all, there are 192 shipbreaking lots at ASSBY, each with a length of 50–240 meters and a width of 30–120

50. *Id.* at 53.

51. *Id.* at 38.

52. *See id.* (stating that India now has a larger shipbreaking industry).

53. PUTHUCHERRIL, *supra* note 10, at 38.

54. *Id.* at 53.

55. Demaria, *supra* note 1, at 252.

56. *Id.*

57. *Id.*

58. *Id.*

meters.⁵⁹ Machinery and heavy equipment (engines, compressors, generators, and boilers) and various components (navigation equipment, furniture, electrical cables, and utensils) are removed from the vessels and sold for reuse to traders directly on the beach lots.⁶⁰ These types of operations do not require any infrastructure or technology because they are mostly labor intensive and the ships themselves provide the moving cranes and motorized winches needed for the practice.⁶¹ Usually, it takes three to six months for an average ship (15,000 tons) to be dismantled using approximately 150–300 workers at various stages of the process.⁶² The volumes of iron and steel recovered at ASSBY are enormous—providing for an estimated ten to 15 percent of India’s total steel production.⁶³ Environmental, safety, and health issues do not seem to be part of the overall costs, even though the process is plagued by major safety, health, and environmental challenges.⁶⁴

Between 1982 and 1983, only five ships were scrapped at ASSBY, but between 2001 and 2002 that number had rocketed to 333.⁶⁵ Surprisingly, the numbers decreased between 2005 and 2006 to only 101 ships.⁶⁶ This decrease was largely driven by an increase in freight shipping rates.⁶⁷ When the freight rates increase, it becomes more economical to maintain and operate older ships than disposing of them for scrap—as the money that can be made operating an older ship, with its additional upkeep and maintenance, is less than the money the ship is bringing in from the high freight shipping costs.⁶⁸ Consequently, a fewer number of ships were scrapped at ASSBY from 2005 to 2006. However, overall, the number of ships dismantled at ASSBY has continued to climb since the yard began operations in the early 1980s, with an annual output averaging more than 100 ships over the past decade.⁶⁹ These numbers are expected to increase further in the near future due to the global recession causing ship owners to

59. Sangeeta Sonak, Mahesh Sonak & Asha Giriyan, *Shipping Hazardous Waste: Implications for Economically Developing Countries*, 8 INT’L ENVTL AGREEMENTS: POLITICS, LAW & ECON. 143, 148 (2008).

60. Demaria, *supra* note 1, at 252–53.

61. *Id.* at 253.

62. *Id.*

63. Sonak, *supra* note 55.

64. Demaria, *supra* note 1, at 250, 253.

65. Sonak, *supra* note 55, at 153.

66. *Id.*

67. *Id.* Demaria, *supra* note 1, at 255.

68. SARRAF, *supra* note 45, at 3, 12–13.

69. *Id.* at 14.

either downsize or go out of business, coupled with the aforementioned recent changes in the IMO single-hull retrofit requirements.⁷⁰

V. THE WASTES OF SHIPBREAKING

In general, ships contain a variety of non-hazardous, hazardous, and even radioactive materials that may or may not be reused or recycled.⁷¹ These wastes may be present in the ship's onboard equipment (built in) or incorporated into the physical structure of the ship itself.⁷²

Non-hazardous materials may include items such as: furniture, scrap wood, plastics, paper, rubber, glass wool, sponge, PVC pipes, metals, and some oils.⁷³ Hazardous materials may be present in such items as: oils, heavy metals contained in navigational equipment and switches, electronics or designed construction components of the ship itself, and anti-fouling agent hull paints designed to repel or kill barnacles or other sea life that attempt to attach to the vessel.⁷⁴ Other types of hazardous materials include such items as PCBs, which can be present in insulation of electrical cables, or asbestos, which is used as a fire retardant in older vessels.⁷⁵ Radioactive materials can also be present in the form of fire detection equipment, which has been documented to contain the radioactive element Americium-241.⁷⁶ Additional waste types include bilge and ballast waters which can contain oil, residuals from past cargos, heavy metals, or foreign/non-native animal or plant species (alien species).⁷⁷ On average, the overall waste generated by the shipbreaking process is between one-half of a percent to ten percent of the ship's total weight, and most of that may be comprised of hazardous materials.⁷⁸

International regulations, such as the 1989 Basel Convention and Protocol, the IMO, and the impending Hong Kong Convention (HKC),

70. *Id.* at 9, 15.

71. Demaria, *supra* note 1, at 253.

72. *Id.*

73. *Id.*

74. Graham-Rowe, *supra* note 17, at 800; *see id.* at 252 (listing dismantled ship components).

75. Graham-Rowe, *supra* note 17, at 800.

76. Demaria, *supra* note 1, at 258.

77. PUTHUCHERRIL, *supra* note 10, at 18. Alien species are those plants or animals that are not native to the environment to which they have been transported. *Id.* Transportation of these species may occur either intentionally or accidentally. *Id.* In the case of shipbreaking, these alien species are unintentionally transported in the water within the ship from their native environment and deposited in a new non-native environment when the water is released. *Id.*

78. Demaria, *supra* note 1, at 253.

require ships destined for dismantling to be certified as clean of removable hazardous wastes and require documentation of any hazardous wastes remaining on the ship.⁷⁹ However, many ships still arrive at shipbreaking yards in developing nations containing vast amounts of toxic, environmentally persistent waste materials, which will potentially be released into the environment or exposed to the workers and surrounding communities.⁸⁰

Average Components Obtained from Dismantle Ocean Going Vessels Upadhaya 2002 – Interviews with Shipbreakers ⁸¹		
	Weight %	Value %
Re-rollable ferrous scrap and iron plates	75-85	65
Reconditioned machinery	10-15	25
Remelting scrap	3	2
Non-ferrous metal	1	7
Furnace oils and other oils	2	0.50
Wood and Furniture	2	0.50
Burning, cutting losses, and waste materials	5-10	0
Hazardous Material Present on a Typical Ocean Going Vessel to be Dismantled Bangladesh ⁸²		
Reusable Liquid Organics	675,000 tons	

79. See NIKOS MIKELIS, THE HONG KONG INTERNATIONAL CONVENTION FOR THE SAFE AND ENVIRONMENTALLY SOUND RECYCLING OF SHIPS (2010), available at <http://www.imo.org/OurWork/Environment/ShipRecycling/Documents/2010-12-09%20%20UNCTAD%20On%20the%20Hong%20Kong%20Convention.pdf> (outlining requirements for ships preparing for recycling).

80. Sonak, *supra* note 55, at 155.

81. Demaria, *supra* note 1, at 255.

82. SARRAF, *supra* note 45, at 32.

PCBs	240,000 tons
Ozone Depleting Substances (such as CFCs)	210,000 tons
Asbestos	79,000 tons
Paints containing PCBs, heavy metals, or Tributyltin TBT	69,200 tons
Acid Waste Liquids	775 tons
Heavy metal (such as lead, or mercury)	687 tons
Waste Liquids	1,978,000 cubic meters
Sewage	107,000 cubic meters

Some estimates indicate that, between 2006 and 2015, approximately 5.5 million tons of these potentially environmentally harmful materials will end up in shipbreaking yards around the world.⁸³ Therefore, the primary concern regarding the shipbreaking process involves the management and/or disposal of the hazardous materials associated with these ships during their demolition.

There are three primary methods of disposal for hazardous wastes during the shipbreaking. The first is decontamination of the ship prior to export for demolition; however, this is costly to the ship owner and requires expertise and technology.⁸⁴ A second disposal option is to implement environmentally protective management at the site of dismantling. This is the option recommended by the International Convention for the Safe and Environmentally Sound Recycling of Ships; however, this may be costly for the shipyard.⁸⁵ The third main disposal method is simply open dumping of the hazardous waste into the environment without any care to its containment or management.⁸⁶ Unfortunately, most of the developing world's ship yards use the third method.⁸⁷ Essentially, wastes that cannot be recycled, re-used, or sold—whether hazardous or not—are disposed of by

83. PUTHUCHERRIL, *supra* note 10, at 18–19.

84. Demaria, *supra* note 1, at 253.

85. *Id.* at 254.

86. *Id.*

87. *Id.*

being openly burned on the beach of the shipbreaking lot, dumped directly into the ocean at the lot, or dumped during the night in the surrounding villages or other industrial areas in the region.⁸⁸

VI. THE TOLL OF SHIPBREAKING

A. Human, Species, and Environmental Costs

1. Workers and Locals

The cost to both workers and communities in shipbreaking areas is immense. It has been estimated that, depending on the number of ships being broken, between 5,000 and 50,000 migrant workers depend on this industry for survival for a daily wage of three to seven U.S. dollars.⁸⁹ According to the United Nations' International Labor Organization, shipbreaking is now considered one of the world's most dangerous occupations.⁹⁰ Laborers receive little training, no protective clothing or equipment, and are constantly exposed to hazardous materials and/or occupational dangers, such as suffocation, falling debris and metal, fire, explosion, falls, and electrocution.⁹¹ In one example, a National Institute of Occupational Health (NIOH) study reported that the chest X-ray examination of 94 workers at ASSBY showed 15 individuals (16%) with clinical signs consistent with asbestosis.⁹²

Shipbreaking workers typically live in shared shanties close to the shipyard with no running water, electricity, or sanitation.⁹³ In addition to exposure to hazardous waste at work, workers are also continually exposed to pollutants even when not at work. These exposures include: high levels of contamination in their local living areas near the shipyard; tainted air from constantly burning waste pyres; drinking water that is frequently fouled by the lack of sanitation and hazardous waste contamination; and highly contaminated fish from polluted waters that workers catch and consume.⁹⁴

88. *Id.*

89. *Id.* at 255.

90. Graham-Rowe, *supra* note 17, at 801.

91. *Id.*

92. Demaria, *supra* note 1, at 255.

93. *Id.*

94. *Id.*

Workers who are sickened or injured can seek help at the local clinic, but most either work until they are killed or are sometimes dumped at sea to drown at the uncaring hand of their employers.⁹⁵ They live by the adage of “one ship, one death,” or “one death per day.”⁹⁶

The local peoples and communities are also impacted by the pollution, either by the dumping of waste from the shipbreaking process in the surrounding areas, which are used for grazing livestock and farming,⁹⁷ or from the continual burning of wastes on the beach.⁹⁸ Villagers often report respiratory and skin problems, kidney disease, livestock death from eating waste, as well as a decrease in the quantity and size of the crops produced in the area.⁹⁹

2. Species

The local fish populations are also impacted—a serious concern since fish are a main dietary staple for the local populations in shipbreaking areas.¹⁰⁰ Fishermen consistently report that, since the shipbreaking activities began in their communities, the quantity, variety, and size of the fish have decreased. Some species have disappeared totally and/or their flavor has become more metallic.¹⁰¹ Fish studies have shown bioaccumulation of high levels of the toxin tributyltin, which is derived from the anti-fouling paints present on the ships.¹⁰² Despite the presence of tributyltin at levels much greater than would be suitable for human consumption, these fish are dried and sold abroad, but they are not only eaten by the local villagers and workers.¹⁰³ Furthermore, some species of contaminated fish in shipbreaking areas are migratory, which could potentially be caught and consumed by distant populations elsewhere, unaware of the potential toxins carried in these fish.¹⁰⁴

95. *Id.* See Will Englund & Gary Cohn, *A Third World Dump for America's Ships?*, THE BALTIMORE SUN, Dec. 9, 1997 (suggesting injured workers have option to seek medical care at local clinics).

96. Demaria, *supra* note 1, at 255.

97. *Id.* at 256.

98. Graham-Rowe, *supra* note 17, at 801.

99. Demaria, *supra* note 1, at 256.

100. *Id.*

101. *Id.*

102. *Id.*

103. *Id.*

104. Demaria, *supra* note 1, at 256.

Select Fish Species Caught Around ASSBY Dholakia 1997 ¹⁰⁵				
	Village of Ghogha		Village of Katpar	
Fish Species	Year 1991	Year 1995	Year 1991	Year 1995
Bombay Duck	102,069 kg	93,862 kg	116,865 kg	46,129 kg
Hilsa	7,020 kg	0 kg	31,762 kg	15,860 kg
Culpid	1,860 kg	0 kg	22,905 kg	23,390 kg
Mullet	44,308 kg	24,809 kg	112,695 kg	12,776 kg
Catfish	21,715 kg	0 kg	13,950 kg	2,250 kg
Colmi (shirmp)	175,250 kg	909,151 kg	30,015 kg	48,072 kg
Medium Prawn	704,179 kg	480,121 kg	108,534 kg	18,690 kg
Jumbo Prawn	214,314 kg	80,400 kg	30,225 kg	0 kg
Lobster	87,141 kg	21,199 kg	1,500 kg	2,769 kg
Colia	0 kg	0 kg	3,348 kg	0 kg
Dohma	0 kg	0 kg	11,497 kg	3,565 kg
Other fish species	420,538 kg	186,427 kg	106,951 kg	27,854 kg

105. *Id.* at 256.

3. Environment

The broader environment in proximity to the shipbreaking areas has been significantly impacted as well. For example, the environmental stress from the shipbreaking activity at ASSBY has led to a decline in biomass as measured by the abundance and species diversity of both plants and animals.¹⁰⁶ There is almost no vegetation in the intertidal zone around ASSBY.¹⁰⁷ The mangroves died shortly after the shipbreaking industry arrived,¹⁰⁸ and the local marine environment shows very low levels of zooplankton and phytoplankton, including a low abundance of fish eggs and larvae.¹⁰⁹ It is well documented that pollutants can mix with suspended solids and travel great distances via the currents and tides to pollute areas further abroad, and, indeed, the coastline within 100 kilometers east and west of ASSBY shows traces of the pollutants as well as oils associated with the shipbreaking process.¹¹⁰ An additional assault to the local environment comes from non-native invasive species that have arrived in the ballast waters of foreign ships and that pose a threat¹¹¹ to the native populations.¹¹² The lack of sanitation for the workers, which has resulted in a pathological bacterial loading of the surrounding surface, ground and sea waters of ASSBY, has caused them to be unsafe for human use and/or consumption.¹¹³

106. *Id.* at 254.

107. *Id.*

108. Susan Leach Snyder, *Living on the Edge . . . Mangrove Estuaries*, 18 J. OF MARINE EDUC. 19, 19 (2002). Mangroves are areas comprised of various kinds of trees and shrubs that grow in saline coastal sediment habitats in the tropics and subtropics. *Id.* Typically, mangroves are found in estuaries and marine shorelines. *Id.* Mangroves provide an important ecosystem for algae, barnacles, oysters, sponges, shrimp, and mud lobsters as well as an intricate habitat necessary for the food web. *Id.* Mangroves have also been recognized as important sources of carbon fixation. *Id.* R.J. DUNLAP MARINE CONSERVATION PROGRAM, OCEAN AND COASTAL HABITATS 5, available at <http://www.rjd.miami.edu/learning-tools/high-school/> (follow third link to mangroves).

109. Demaria, *supra* note 1, at 254.

110. *Id.*

111. Puthucherril, *supra* note 10, at 131. During the shipbreaking process and the release of the ship's ballast waters, alien species are unintentionally transported within the ship from their native environment and deposited in a new non-native environment wherever the water is released. *Id.* When non-native species are released into an environment that is not where the species would naturally be located, the species may not be able to survive. *Id.* However, in many instances, these non-native species are not only capable of surviving, but, without the organisms' natural predators present, these alien species also thrive and can outcompete the local species. *Id.* Consequently, the local species may be decimated by these newcomers and may not be able to recover resulting in extinction in that environment. *Id.*

112. *Id.* at 132.

113. Demaria, *supra* note 1, at 254.

VII. THE SHIPBREAKING REGULATORY SCHEME: A TANGLED WEB

A. National Laws

Developed countries typically have an extensive regulatory framework for the proper management and disposal of various waste streams, all with the same common intent to be protective of human health and the environment. However, while each nation has laudably taken the initiative, the result has been a tangled mass of regulatory oversight that, unfortunately, does not address the shipbreaking industry as a whole in a comprehensive way. In contrast, developing countries frequently lack comprehensive environmental laws, and, if these do exist, they are often poorly enforced for various reasons stated below.

1. United States

In the U.S., there are several overlapping regulatory schemes that are under the jurisdiction of the United States Environmental Protection Agency (U.S. EPA). These regulations address hazardous waste management and disposal, but not the specific issues associated with a ship itself as a potentially hazardous waste.

a. RCRA

The Resource Conservation and Recovery Act (RCRA) is a U.S. law that provides the general guidelines for the waste management program envisioned by Congress.¹¹⁴ This program is under the jurisdiction of the US EPA. The RCRA hazardous waste program, under Subtitle C, establishes a system for controlling and documenting hazardous waste from the time it is generated until its ultimate disposal, essentially from “cradle to grave.”¹¹⁵ RCRA regulations governing hazardous waste identification, classification, generation, management and disposal are located in the Code of Federal Regulations (CFR), 40 C.F.R. Part 260.¹¹⁶ Hazardous waste cargos and hazardous waste present on a ship destined for demolition would potentially come under this regulatory scheme, but hazardous components that are part of the ship itself are not regulated under RCRA.¹¹⁷ Thus, the ship may be

114. 42 U.S.C. § 6901 et seq. (2006).

115. *Id.* §§ 6921–6939(e).

116. 40 C.F.R. §§ 260–279 (2006).

117. *See* 42 U.S.C. § 6901 et seq. (2006) (§ 6903 might be interpreted to include the entire ship in the definition of hazardous waste, but such categorization remains unclear and has not been applied).

void of any hazardous waste cargo but may still have components within the ship's construction, such as asbestos for fire retardants, and the ship would not fall under any regulatory authority by RCRA.

b. Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) was established in 1976 under the United States Code Title 15, § 2601 for the Control of Toxic Substances.¹¹⁸ "TSCA addresses the production, importation, use, and disposal of specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon and lead-based paint."¹¹⁹ Many of these chemicals are often found on ships destined for recycling and would potentially fall under this regulation if these were part of the ship's cargo.¹²⁰ Similar to RCRA, if the hazardous waste is a component of the ship itself, these hazardous waste components would not be regulated by TSCA and the ship would not be managed as containing hazardous wastes.

c. Marine Environmental Protection Committee

Also housed under the U.S. EPA is the Marine Environment Protection Committee (MEPC), which is a member of the International Maritime Organization (IMO).¹²¹ The U.S., which is represented by the U.S. EPA on the committee, has been a member state of the IMO since 1950.¹²² During the MEPC/IMO 60th session held over March 22–26, 2010, the MEPC continued its work on developing guidelines for safe and environmentally sound ship recycling—the "Ship Recycling Plan."¹²³ These guidelines are aligned with and meet the requirements of the Hong Kong International Convention (HKC) for the Safe and Environmentally Sound Recycling of Ships, which was adopted in May 2009, and, once developed, will assist ship recycling facilities and ship operators to begin introducing *voluntary*

118. 15 U.S.C. § 2601 et seq. (2006).

119. *Summary of the Toxic Substance Control Act*, U.S. ENV'T'L. PROT. AGENCY, <http://www.epa.gov/lawsregs/laws/tsca.html> (last visited July 22, 2012).

120. Graham-Rowe, *supra* note 17, at 801.

121. *International Maritime Organization*, U.S. ENV'T'L. PROT. AGENCY, <http://www.epa.gov/international/io/imo.html> (last visited July 22, 2012).

122. *Id.*

123. *Id.*

improvements.¹²⁴ However, the voluntary nature of the guidelines calls into question their consistency of application and enforceability.¹²⁵

d. U.S. Regulatory Conclusion

Overall, the U.S. regulatory scheme appears to only nibble at the edges of the problem, but fails to confront the shipbreaking issue head on. While the hazardous nature of the cargos is strictly regulated, the ship itself—which may contain a varied mix of hazardous materials—is not regulated and is free to be dismantled and re-used without any oversight.

2. European Union

The European Union (EU) unified several individual countries' hazardous waste regulations following creation of the EU. This resulted in the Hazardous Waste Directive—(Directive 2008/98/EC).¹²⁶ While this unified approach to the hazardous waste issue is a step in the right direction, it also still lacks specificity for the shipbreaking process. For example, controversy has arisen around the E.U. definition of 'waste,' which is defined as anything that the holder discards or intends to discard.¹²⁷ Ship owners claim that outmoded ships that are still seaworthy are not actually being discarded, but are, instead, being recycled and, therefore, would not be considered a waste as the ship is not being discarded.¹²⁸

a. Hazardous Waste Directive - 2008/98/EC

This directive clarified and unified some of the oldest E.U. law addressing hazardous waste.¹²⁹ The directive defines hazardous and non-

124. *Id.*

125. *See Marine Environment Protection Committee, 63rd Session*, INT'L MAR. ORG. (March 2, 2012), <http://www.imo.org/MediaCentre/MeetingSummaries/MEPC/Pages/MEPC-63rd-session.aspx> ("The MEPC adopted the 2012 Guidelines for Safe and Environmentally Sound Ship Recycling and the 2012 Guidelines for the Authorization of Ship Recycling Facilities. These guidelines, along with the 2011 Guidelines for the development of the Inventory of Hazardous Materials and the 2011 Guidelines for the development of the Ship Recycling Plan that were adopted by MEPC 62, are intended to assist ship-recycling facilities and shipping companies to commence introducing voluntary improvements to meet the requirements of the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, which was adopted in May 2009.").

126. Council Directive 2008/98, art. 175, 2008 O.J. (L 312) 3 (EC).

127. PUTHUCHERRIL, *supra* note 10, at 80.

128. *Id.*

129. Council Directive 2008/98, art. 175, 2008 O.J. (L 312) 3 (EC).

hazardous waste, and differentiates between recovery and disposal.¹³⁰ Under the directive, E.U. member states are required to ensure that the hazardous waste is identified and recorded.¹³¹ States must also ensure that different categories of hazardous waste are not mixed, and that hazardous waste is not mixed with non-hazardous waste, unless the necessary measures have been taken to safeguard human health and the environment.¹³² Any facility or actions that carry out disposal operations must obtain a permit to operate and must track the origin and destination of the wastes within the E.U.¹³³

b. Hazardous Waste Directive – WSR 259/93

This E.U. directive is one of the most stringent laws on the prevention of trade of hazardous wastes, including shipments within, into, and out of the E.U.¹³⁴ In July 2007, this regulation was replaced by WSR 1013/2006, which was designed to halt the movement of toxic ships from the E.U. to the Indian subcontinent.¹³⁵ Under this regulation, a ship being exported for disposal would be prohibited unless it would be sent to a European Free Trade Association (EFTA) country that is also a party to the Basel Convention.¹³⁶ Exportation of ships for recovery or recycling are also prohibited unless sent to a country that is a party to the Basel Convention or other bilateral or multilateral agreements which are compatible with the E.U. legislation.¹³⁷

This regulation covers ships destined for shipbreaking if the ship has built-in components which may contain hazardous materials of such quantity as to be considered a hazardous waste.¹³⁸ This aspect of the directive was decided in the E.U. case of *Upperton Ltd., with offices in Mauritius v. The Minister of Housing, Spatial Planning and the Environment*.¹³⁹ In that case, the Council of State opined that the ship “Sandrein” was a waste due to the amount of asbestos contained within the hull (a built-in component of the ship) which would pose risks that, when

130. *Id.* at 9–10.

131. *Id.* at 12, 15.

132. *Id.* at 12–13, 15.

133. *Id.* at 16, 19.

134. PUTHUCHERRIL, *supra* note 10, at 43.

135. *Id.*

136. *Id.* at 44.

137. *Id.*

138. *See id.* (explaining the E.U. directive’s system of classifying hazardous waste as either green, amber, or red, with red being the most hazardous).

139. PUTHUCHERRIL, *supra* note 10, at 84.

dismantled, would qualify the ship as a “red list” hazardous waste under the directive.¹⁴⁰

d. E.U. Regulatory Conclusion

The E.U. is similar to its counterpart in the U.S. regulatory scheme; hazardous components of ships are not addressed by the specific directives or, if addressed, are not subject to the E.U. regulations once the ship leaves the E.U.¹⁴¹

3. India, Pakistan, Bangladesh, and China – the Developing Countries

a. Bangladesh

Currently, Bangladesh is poised to become the world leader in shipbreaking, with the 2011 Bangladesh Supreme Court’s decision to lift a ban on the shipbreaking industry in the country.¹⁴² Bangladesh anticipates dismantling 300 ships by the end of 2012, an approximate 36% increase over 2009 numbers (before the ban was instated).¹⁴³ While the shipbreaking industry in Bangladesh has been operating for approximately 40 years, there still is no legal regime in place to regulate this industry and it remains a market-driven activity.¹⁴⁴

b. Pakistan

In 1999, Pakistan had a 15% share of the shipbreaking market.¹⁴⁵ During that same year, the Pakistan government decided to increase the import duty on ships destined for demolition on Pakistan beaches to 45%.¹⁴⁶ Consequently, the shipbreaking industry in Pakistan ground to a halt. This resulted in pressure on the government from industrialists and other lobbyists to lift the tax over the fear that Pakistan would no longer have a

140. *Id.* at 84–85.

141. *See id.* at 44–45 (noting that the directive focuses on the waste aboard a ship, rather than the components of a ship; also, reflagging the ship to a non-E.U. country removes it from the scope of the directive).

142. Syed Mohammed Tahir, *Local Ship-Breaking Industry Sinking While BDs Emerging*, THE NATION (May 30, 2012), <http://www.nation.com.pk/pakistan-news-newspaper-daily-english-online/Business/30-May-2011/Local-shipbreaking-industry-sinking-while-BDs-emerging>.

143. *Id.*

144. PUTHUCHERRIL, *supra* note 10, at 29.

145. *Id.* at 30, n.143.

146. *Id.*

shipbreaking industry.¹⁴⁷ Bending to the pressure, the government relaxed the import duty, and, in 2006, Pakistan once again was taking ships for demolition and leaped into third place on the world stage in the shipbreaking market.¹⁴⁸

c. India

Today, activity at ASSBY is in steep decline, due mainly to the global recession, but also, in part, as a result of the introduction of a regulatory framework by the Supreme Court of India to provide cleaner and safer shipbreaking practices.¹⁴⁹ This legal regime included such regulations as: guidelines for shipbreaking that minimize environmental impact and proper citing of shipbreaking areas; the 2003 Gujarat Maritime Board of Ship Recycling Regulations, which strengthens the current legislations for worker safety, welfare, and environmental protection in the province of Gujarat, which includes ASSBY; requirements for shipbreaking yards to comply with the International Maritime Organization (IMO) and International Labor Organization (ILO) conventions for shipbreaking, which have already been ratified by the Indian government; Ship Recycling Regulations (SRR), which mandate ship recyclers to ensure compliance with the Water Act of 1974, Air Act of 1981, Hazardous Waste Management and Handling Rules of 1989, and the Coastal Regulations Zone Notification of 1991; open burning of waste as prohibited by law; SRR rules for beaching of ships; and the fact that India is a party to the Basel Convention.¹⁵⁰

Unfortunately, this extensive framework has been slowly and systematically diluted by the very judiciary that spearheaded its creation, due primarily to pressures from trade organizations and economic challenges.¹⁵¹ The loss of business at ASSBY due to this regulatory regime was a windfall for Bangladesh, whose regulations were much weaker, if not totally non-existent.¹⁵² However, the Indian regulatory controls are being eroded by the both the government and the very Court that instituted them as market forces and trade organizations apply more and more pressure.¹⁵³

147. *Id.* at 30.

148. *Id.*

149. *Id.* at 53.

150. PUTHUCHERRIL, *supra* note 10, at 59–61.

151. *Id.* at 77.

152. *Id.*

153. *Id.*

The events of the *Clemenceau*¹⁵⁴ and the *Blue Lady*¹⁵⁵ in Indian waters and the reluctant response by the judiciary and the executive areas, in spite of extensive regulatory regimes, have shown the strong pull that these forces have had over the industry, as well as the ineffectiveness of developing countries' national laws to regulate a global industry.¹⁵⁶

d. China

In 1993, China instituted a regulatory framework due to concern over the environmental impacts of the shipbreaking industry.¹⁵⁷ These regulations on the Chinese shipbreaking industry proved to be a windfall for India's shipbreaking yard, faltering under India's failing regulatory regime, and causing detriment to China's shipbreaking industry.¹⁵⁸ China's shipbreaking practices are now considered superior to the rest of Asia as a significant green recycling process.¹⁵⁹

e. Regulatory Conclusion

Developing countries, in general, argue that the recycling of waste products, such as ships, conserves natural resources, reduces strains on energy demands, minimizes waste disposal, and helps industrial growth by providing raw materials.¹⁶⁰ Many times the government and/or the populace is willing to forego basic protections for the opportunity to make a living, or just to survive.¹⁶¹

Most developing countries have various degrees of a regulatory framework for the protection of the environment and, in some instances, protection of the workers and their rights. However, it frequently seems that these regulations may not be written for the proper management and disposal of hazardous wastes, or, alternatively, any existing comprehensive regulations are simply not enforced. Even those countries that have no known regulatory oversight of the industry have essentially made a decision to allow no regulation over their shipbreaking business. In all cases, it seems that economic interests dominate over environmental or human

154. *Infra.* Part VIII.B.

155. *Infra.* Part VIII.A.

156. PUTHUCHERRIL, *supra* note 10, at 54.

157. *Id.* at 38.

158. *Id.*

159. *Id.*

160. Sonak, *supra* note 55, at 155.

161. *Id.*

health considerations during the regulatory decision making process. Where laws are limited or non-existent, decisions for drafting hazardous waste regulations seem to be overshadowed by a government that is either ill-equipped to handle the waste, uninformed as to the challenges that these types of waste streams present, or willfully blind to the problems and impacts of the mismanagement of hazardous waste. When regulatory frameworks are implemented and enforced, as in China, there seems to be an economic backlash. Shipowners and cash buyers choose cheaper and less regulated operations for their shipbreaking needs, ultimately re-enforcing a government's decision not to regulate for fear of losing the industry to their neighbors.

B. International Laws

A key challenge faced by any international set of regulations is the competing interests of the various nations involved. Consequently, a myriad of regulatory organizations, conventions, and agreements is usually involved that also results in a tangle of regulatory oversight. Unfortunately, this is the case for shipbreaking; no one set of regulations exists that specifically addresses this industry and its unique challenges.

The international legal regime is murky and struggles with the tradeoff between regulatory instruments and the obligations they place on the signatories. Some of the instruments are non-binding and others are non-specific in their application to shipbreaking.¹⁶² The international laws appear to have evolved as an accumulation of legacy regulations instead of an integrated approach specifically designed for the shipbreaking process.

1. Basel Convention

As an International treaty, the 1999 Basel Convention and Protocol (Basel Convention), attempts to bridge the gap between developed and undeveloped countries because the treaty signatories include members from all over the globe—developed and undeveloped nations alike.¹⁶³ The basis of the Basel Convention arose in the 1980s out of international concern over the escalating increase in transboundary movement of hazardous waste

162. PUTHUCHERRIL, *supra* note 10, at 144.

163. See *133 Parties to the Basel Convention (11 November 1999)*, GRID-ARENDAL (Feb. 24, 2012), http://www.grida.no/graphicslib/detail/133-parties-to-the-basel-convention-11-november-1999_a8e1.

across national boundaries.¹⁶⁴ As a result, the United Nations General Assembly directed the United Nations Environment Program to take action, and the result was the creation of the 1989 Basel Convention.¹⁶⁵ By July 1997, 113 countries had voluntarily ratified one of the Basel Convention's key outcomes: the "Control of Transboundary Movement of Hazardous Wastes and their Disposal" treaty.¹⁶⁶ In 1999, the 1989 Basel Convention was revised to include a mechanism to assign liability and provide compensation for damages resulting from hazardous waste transboundary shipments (the Protocol of the Basel Convention).¹⁶⁷ The 1999 Basel Convention and Protocol has now effectively become the first international environmental agreement.¹⁶⁸ However, while the Basel Convention has been ratified by 146 nations, including the European Union member states, some countries, including the United States, have not yet ratified the treaty, and, therefore, are not bound by its articles.¹⁶⁹

The Basel Convention has three main goals: 1) to reduce the amount of hazardous waste generated worldwide, 2) to promote disposal of wastes as close to the source of generation as possible, and 3) to encourage the environmentally sound management and disposal of those wastes.¹⁷⁰ The Convention mirrors the regulations of many developed countries in the aspect of notice and consent procedures for hazardous waste transportation.¹⁷¹ Exporting parties must notify the transporter and importing country, and communicate the nature of the wastes being exported to them.¹⁷² Only once the importing country provides written notification of acceptance may the exporter initiate transportation of the wastes.¹⁷³ However the Convention goes one step further than most developed countries' regulations by requiring shipments of hazardous waste to be allowed only to those countries that are able to manage the wastes in

164. Kaixian Hu, Keith Hipel, Liping Fang, *A Conflict Model for the International Hazardous Waste Disposal Dispute*, 172 J. HAZARDOUS MATERIALS 138, 138 (2009).

165. *Id.*

166. *Id.*

167. Sejal Choksi, *The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal: 1999 Protocol on Liability and Compensation*, 28 ECOLOGY L.Q. 509, 510 (2001).

168. *Id.* at 509.

169. *Id.* at 516.

170. *Id.* at 516–517.

171. *Id.* at 517.

172. Choksi, *supra* note 163, at 517.

173. *Id.*

an environmentally sound manner, regardless of whether the importing country agrees to take the waste.¹⁷⁴

In 2002, the Basel Convention adopted the Technical Guidelines on the Environmentally Sound Management of the Full and Partial Dismantling of Ships (TGSD).¹⁷⁵ Its goal was to develop the best practices in the “design, construction and operation of ship-dismantling facilities.”¹⁷⁶ However, opponents have argued that the TGSD does not address issues to minimize the hazardous materials on board a ship prior to arriving at a ship recycling facility, and it is silent on the need to use dry docks as the environmentally sound method of dismantling ships.¹⁷⁷

Another potential weakness of the Basel Convention is that it contains confusing definitions regarding what is waste and what is recyclable, which impacts whether or not waste material is subject to its jurisdiction.¹⁷⁸ This problem causes ambiguity, confusion, and abuse for application and enforcement.¹⁷⁹ It has been argued that the Basel Convention does not cover the hazardous waste components of ships that arise in the shipbreaking industry.¹⁸⁰ However, the majority believes that ships destined for demolition are, in fact, themselves a waste product under the Basel Convention and, therefore, any wastes contained on that ship would fall under the Convention’s jurisdiction—including the hazardous ship components.¹⁸¹ This disparity in interpretation remains to be resolved.

2. Organization for Economic Co-Operation and Development Agreement

The Organization for Economic Co-Operation and Development (OECD) is an international organization established in 1961 to assist participating countries in achieving sustainable economic growth, employment, and an increased standard of living, while simultaneously

174. *Id.*

175. PUTHUCHERRIL, *supra* note 10, at 107.

176. *Id.* at 113.

177. *Id.*

178. *See id.* at 113–14 (illustrating that the shipping industry has used the Basel Convention to argue that material produced in the normal operation of a ship cannot be considered waste).

179. Zada Lipman, *A Dirty Dilemma: The Hazardous Waste Trade*, 23 HARV. INT’L R. 67, 68 (2006).

180. Michael Tsimplis, *Liability and Compensation in the International Transport of Hazardous Wastes by Sea: The 1999 Protocol to the Basel Convention*, 16 INT’L J. OF MARINE AND COASTAL L. 295, 332 (2001).

181. *Id.*

ensuring the protection of human health and the environment.¹⁸² OECD countries concern themselves with a host of international socio-economic and political issues, including environmental issues such as the transboundary movement of waste.¹⁸³ Presently, there are 30 OECD member countries, including the European Union and the United States. On March 30, 1992, the OECD passed the “Control of Transfrontier Movements of Waste Destined for Recovery” that applies to transboundary movements of waste that are destined for recycling operations between OECD countries.¹⁸⁴ This agreement provides a framework for OECD countries to control transboundary movement of recyclable waste in an environmentally sound manner between signatory OECD countries.¹⁸⁵ This agreement would also have control over the shipbreaking industry, to some extent, regarding the recycling of wastes on these ships, including hazardous components of the ships themselves.¹⁸⁶ However, it is only binding on those countries that are signatories to the agreement, speaks solely to OECD countries, and does not address non-recyclable wastes.¹⁸⁷ These omissions in the OECD agreement leave the majority of the world’s countries, who are not signatories, to do as they please.

3. International Maritime Organization Guidelines

The IMO is the primary international agency for coordinating the development of rules on maritime issues.¹⁸⁸ The IMO is a specialized agency of the United Nations that is responsible for measures to improve the safety and security of international shipping, and to prevent marine

182. *About the Organisation for Economic Co-operation and Development (OECD)*, OECD.ORG, http://www.oecd.org/pages/0,3417,en_36734052_36734103_1_1_1_1_1,00.html (last visited July 13, 2012).

183. ORG. FOR ECON. COOP. AND DEV., *Guidance Manual for the Control of Transboundary Movement of Recoverable Wastes*, at 2–3 (2009), available at <http://www.oecd.org/dataoecd/57/1/42262259.pdf>.

184. *Id.* at 10.

185. *Id.*

186. *Id.*

187. *Id.*

188. Saurabh Bhattacharjee, *From Basel to Hong Kong: International Environmental Regulation of Ship-Recycling Takes One Step Forward and Two Steps Back*, 1 TRADE, L. AND DEV., 193, 200 (2009).

pollution from ships.¹⁸⁹ The IMO was established by the United Nations in Geneva on March 17, 1948, and currently has 169 Member States.¹⁹⁰

In December 2003, in a response to the growing need for regulation of the international trading of ships for shipbreaking, the IMO developed a set of voluntary guidelines aimed at improving the ship disposal process.¹⁹¹ Known as the IMO Guidelines on Ship Recycling (IMOGSR), it proposes a “Green Passport” approach to ship breaking.¹⁹² The Green Passport is a document containing an inventory of all potentially hazardous materials used in the construction of a ship, which is intended to accompany the ship throughout its functioning lifetime.¹⁹³ Thus, when the ship is sent for dismantling, the Green Passport would communicate the possible toxic threats to humans and the environment upon demolition. The document would also potentially encourage shipbuilders and designers to use alternatives to hazardous materials in designing their ships, leading, in principle, to an environmentally cleaner and safer ship.¹⁹⁴ In addition, owners of existing ships are instructed to develop a Ship Recycling Plan (SRP) that would include the identification of suitable recycling facilities under IMO guidelines within the next five years.¹⁹⁵

Opponents criticize the IMOGSR because the obligation to ensure environmental and worker safety in the shipbreaking process falls to the shipbreaking facility and the regulatory authorities of the countries where the facilities operate.¹⁹⁶ Additionally, it has also been noted that the IMOGSR does not address the option for prior decontamination of vessels before the ship arrives at the shipbreaking facility.¹⁹⁷ This option would alleviate the burden placed on the facility to manage potentially hazardous materials and shift the burden to the ship owner or cash buyer to manage.

While the IMO appears to have developed one of the most focused sets of guidelines designed to improve the shipbreaking process through control of the shipbreaking facility, these guidelines are just that, voluntary suggestions that are not binding on any party.¹⁹⁸ Additionally, the guidelines

189. *Brief History of IMO*, IMO.ORG, <http://www.imo.org/About/HistoryOfIMO/Pages/Default.aspx> (last visited July 7, 2012).

190. *Member States, IGOs, and NGOs*, IMO.ORG, <http://www.imo.org/About/Membership/Pages/Default.aspx> (last visited July 7, 2012).

191. Bhattacharjee, *supra* note 184, at 207.

192. *Id.* at 208.

193. *Id.*

194. *Id.*

195. Bhattacharjee, *supra* note 184, at 207.

196. PUTHUCHERRIL, *supra* note 10, at 141.

197. *Id.*

198. *Id.* at 143.

exist amid a sea of other binding and non-binding regulatory frameworks, making the guidelines potentially less significant.¹⁹⁹

4. Law of the Seas (LOS)

In 1982, the LOS was adopted by the Third United Nations Conference on the Law of the Sea.²⁰⁰ Its key element is the obligations of 150 states, who are parties to the LOS convention, to control pollution from land-based activities, such as shipbreaking, through creation of regulatory frameworks.²⁰¹ Unfortunately, the major shipbreaking states of India, Pakistan, and Bangladesh, who are parties to the LOS Convention, have yet to enact measures to prevent such pollution—especially since there appears to be no incentive to do so.²⁰²

5. Hong Kong Convention

The Hong Kong Convention (HKC) is an international convention that was developed under the framework of the IMO.²⁰³ The output of the convention was the Safe and Environmentally Sound Recycling of Ships agreement, which was adopted in Hong Kong in May 2009.²⁰⁴ The HKC is expected to enter into force in 2015.²⁰⁵ The preamble of the HKC demonstrates the commitment of the IMO to obligate the signatories to the convention; it calls upon the signers to “give full and complete effect” to its terms.²⁰⁶ Parties to the convention are to adopt effective measures to ensure that ships entitled to fly the HKC flag or operate under the HKC authority comply with the requirements of the agreement.²⁰⁷ The HKC applies control and enforcement measures from two angles: 1) it establishes a set of standards that apply to ships during their operational lifetime, and 2) it establishes standards for the operation of the ship recycling facilities.²⁰⁸ The HKC defines “ship recycling” to include the process of recovery of “components and materials for re-processing and re-use, while taking care of hazardous and other materials, and includes associated operations such

199. *Id.* at 144.

200. *Id.* at 116.

201. PUTHUCHERRIL, *supra* note 10, at 117.

202. *Id.*

203. MIKELIS, *supra* note 74, at 11.

204. *Id.*

205. *Id.* at 29.

206. PUTHUCHERRIL, *supra* note 10, at 148.

207. *Id.* at 149.

208. *Id.*

as storage and treatment of components and materials on site.²⁰⁹ While this definition does not cover all aspects involved in further processing or disposal of material, it does capture the immediate environmental concerns associated at the point of demolition of the ships, including management of waste and hazardous waste materials.²¹⁰

Ship recycling facilities authorized under the HKC are only to accept ships for recycling that comply with the requirements of the HKC—mainly HKC flagged ships.²¹¹ However, non-HKC flagged ships may still be taken by the facility for recycling, as long as the ship is in compliance with HKC standards.²¹² The idea behind this requirement is two-fold: 1) to ensure HKC-compliant ship recycling facilities a consistent flow of HKC-compliant ships for processing, and 2) to encourage ship owners to use HKC-compliant recycling facilities.²¹³ These two elements hopefully will curtail both the flow and financial profitability of producing or owning non-HKC-compliant ships, and the continued existence of non-HKC compliant recycling facilities.²¹⁴ However, each signatory state that has an HKC-authorized ship recycling facility will be responsible for ensuring that the recycling facility is designed, constructed, and operated in a safe and environmentally sound manner.²¹⁵

All HKC ship recycling facilities are to develop a series of plans and trainings to ensure environmental and worker protection, including emergency response and preparedness for accidents and spills, worker safety and training, environmentally sound management of hazardous wastes, procedures for preventing adverse effects to human health and the environment, and a ship recycling process.²¹⁶

A key requirement under the HKC is the Inventory of Hazardous Materials (IHM) that is to be completed by the ship owner and provided to the recycler before commencement of recycling.²¹⁷ Materials to be included in the IHM are asbestos, PCBs, ozone depleting substances, tributyltin, metals, flame retardants, and radioactive substances.²¹⁸ In addition,

209. *Id.* at 150.

210. *Id.*

211. PUTHUCHERRIL, *supra* note 10, at 151.

212. *Id.*

213. *Id.*

214. *Id.*

215. *See id.* at 156–60 (detailing the obligations that the Ship Recycling Convention imposes upon recycling facilities).

216. MIKELIS, *supra* note 74, at 36.

217. *Id.* at 15.

218. *Id.* at 21.

asbestos, PCBs, ozone depleting substances, and tributyltin are to be banned for use by all signatory parties under the agreement in all new ship construction.²¹⁹ Metals, flame retardants, and radioactive substances can still be part of a ship's design, but must be declared in the IHM.²²⁰

Once a ship is designated to be dismantled, the HKC agreement requires the ship to notify the country of registration and to obtain an International Ready for Recycling certificate, certifying the ship is free of hazardous materials.²²¹ Under the agreement, the shipbreaking process is to take place in facilities that are properly equipped and able to safely manage those hazardous materials which may be specifically present within the individual ships, for the sake of their workers and the environment.²²²

Violations of the HKC by either the ships or the ship recycling facility are to be prohibited under the national law of the signatory states.²²³ Additionally, the signatory states are to establish sanctions that are adequate in severity to deter non-compliance.²²⁴ Therefore, there is an obligation by the HKC upon the signatory states to implement within each state their own national HKC regulatory regime.

In combination, the IMO guidelines and the HKC agreement appear to address the issues involving the shipbreaking process most comprehensively. Unfortunately, neither of these two regulatory schemes are recognized as international law and, hence, are non-binding upon non-signatory states. But the hope is that this will change in the near future with increased awareness of the global environmental impact caused by unregulated shipbreaking.

C. Regulatory Loopholes

As discussed, many countries have taken the initiative and have implemented strict regulations for the proper management and disposal of hazardous materials contained on their vessels destined for demolition. In spite of all the regulations and legislation to prevent the mismanagement of hazardous waste containing ships sent for demolition, unscrupulous ship owners have developed techniques to bypass the laws.²²⁵ The owners of many ships registered in highly regulated countries often prefer to resort to

219. *Id.* at 16.

220. *Id.*

221. MIKELIS, *supra* note 74, at 17.

222. *Id.* at 20.

223. PUTHUCHERRIL, *supra* note 10, at 164.

224. *Id.*

225. *Id.* at 45.

“re-flagging” end-of-life ships with a flag of convenience,²²⁶ which allows the real owner to hide their identity and to circumvent any regulatory obligations required by their respective countries.²²⁷ Many countries allow this re-flagging because their maritime law is lax and/or unscrupulous ship owners wish to reduce operating costs by avoiding government regulations or taxes.²²⁸ This approach allows the ship owner to easily broker the ship for demolition without the burdens imposed by the regulations of the country where the ship is truly registered.²²⁹ The IMO guidance does not allow the use of flags of convenience, which should reduce or close this loophole for regulatory abuse.²³⁰

Another way ship owners can avoid their regulatory obligation to properly manage a ship’s hazardous waste is by selling the ship to another individual and shifting the obligation to the purchasing individual to manage the ship. In return, the purchaser reaps the financial rewards of selling the ship for scrap.²³¹ Such a sale can also be accomplished through offshore shell companies, which can mask the details from regulatory scrutiny.²³²

VIII. A TALE OF TWO SHIPS—A CASE STUDY

In light of all the regulations and oversight in many developed countries to ensure proper disposal of ocean vessels and their wastes, it would seem that there should be less chance for mismanagement of the ships that originate in such countries. However, the following case studies exemplify the ongoing challenges and the varying outcomes that have resulted, even in countries that have extensive regulatory oversight.

226. *What are Flags of Convenience?*, INTERNATIONAL TRANSPORT WORKER’S FEDERATION, <http://www.itfglobal.org/flags-convenience/sub-page.cfm> (last visited July. 22, 2012). A flag of convenience is a method of flying a flag recognizing the ship as belonging to a country other than that of the ship owner and/or registration. *Id.*

227. *Id.*

228. *Id.*

229. *Id.*

230. MIKELIS, *supra* note 74, at 17.

231. Demaria, *supra* note 1, at 252.

232. *Id.* at 251.

A. Blue Lady

The S.S. France was the longest French passenger ship built in 1960, and the ship was touted as the world's most glamorous cruise ship.²³³ In 1979, the ship was sold to the Norwegian Cruise Lines and renamed the S.S. Norway.²³⁴ However, in 2003, the ship was seriously damaged by a boiler explosion in Miami and was towed to Germany for repairs.²³⁵ In 2004, it was determined that it was not economically feasible to remove the asbestos from the damaged area of the ship to complete the repairs, and, consequently, the ship departed Germany en route to Singapore for demolition in 2005.²³⁶ Because the ship owner intended to discard the ship, the S.S. Norway became waste by regulatory definition, under the E.U. Waste Shipment Regulations.²³⁷ Additionally, the presence of a hazardous substance such as asbestos would also cause the ship to be considered a hazardous waste under the 1999 Basel Convention.²³⁸ The ship arrived in Malaysia with plans to be sold and dismantled in Bangladesh; however, due to protests by the Bangladeshi Environmental Lawyers Association (BELA), the sale was voided.²³⁹ In 2006, the ship (then in Dubai) departed under the guise that it would be repaired for reuse, but, in reality, the S.S. Norway was headed for ASSBY for demolition.²⁴⁰ In June 2006, the ship was sold through the Norwegian Cruise Line in Bermuda to the Liberian company Bridgeed Shipping, and, after one month, the ship—now renamed the Blue Lady—was sold, yet again, to two other shipbreaking companies for 15 million dollars.²⁴¹ The Blue Lady was initially beached illegally at ASSBY in 2006, but was eventually allowed to be dismantled by an Indian Final Court Order in September 2007.²⁴²

The Indian Supreme Court battle that ensued while the Blue Lady resided on the beaches of ASSBY pitted Indian environmentalists and villagers against the will of the government.²⁴³ The environmentalists argued that, because the ship contained 1250 tons of asbestos and

233. *Id.* at 257.

234. *Id.*

235. *Id.*

236. Demaria, *supra* note 1, at 257.

237. *Id.*

238. *Id.*

239. *Id.*

240. *Id.*

241. Demaria, *supra* note 1, at 257.

242. *Id.*

243. *See generally* Demaria, *supra* note 1, at 257–59 (noting that both environmentalists and villagers brought legal challenges to the government's decision to dismantle the Blue Lady).

radioactive materials in fire detectors, its importation was banned under both the 1999 Basel Convention (to which India is a signatory), as well as the 2003 Indian Hazardous Waste Rules.²⁴⁴

The Iron Steel Scrap and Shipbreakers Association of India argued that shipbreaking is an environmentally friendly activity because recycling the materials saves non-renewable resources, the process does not produce solid waste, and even the IMO recognizes shipbreaking as a green industry.²⁴⁵ The association went on to state that the regulations did not cover ships themselves as hazardous waste; therefore, the national and international regulations for the transport of hazardous waste should not apply.²⁴⁶ Furthermore, the Indian Supreme Court noted that dismantling the *Blue Lady* would employ 700 workers and provide 41,000 tons of steel, which would, in turn, reduce the demand for mining activities in other parts of the country.²⁴⁷

The Supreme Court opined that “[w]here the commercial venture or enterprise would bring in results which are far more useful for the people, the difficulty of a small number of people [the local villagers that would ultimately be impacted by the activity] has to be bypassed.”²⁴⁸ In essence, the Court believed the balancing of the hardships tipped in the favor of the generation of revenue, employment, and the public interest as opposed to environmental and human protection.²⁴⁹

*B. Le Clemenceau*²⁵⁰

Le Clemenceau was a French aircraft carrier decommissioned in 1997 and destined for ASSBY in 2005.²⁵¹ Before the ship entered Indian waters, Indian environmentalists began to wage a campaign against the vast amounts of toxic wastes still on board in components of the vessel itself.²⁵² The *Le Clemenceau* allegedly contained 550 tons of asbestos and an unknown quantity of PCBs.²⁵³ Because asbestos was still present on the ship destined for demolition, the ship would be classified as a hazardous waste

244. *Id.*

245. *Id.* at 258.

246. *Id.*

247. *Id.*

248. Demaria, *supra* note 1, at 257–58.

249. *Id.* at 258–59.

250. Sonak, *supra* note 55, at 150.

251. *Id.* at 151.

252. *Id.*

253. *Id.*

under the 1999 Basel Convention, and the importation would not be allowed under the 2003 Indian Hazardous Wastes Rules.²⁵⁴ Neither Turkey, Greece, nor even Bangladesh would accept the *Le Clemenceau* for shipbreaking, even though the 22,000 tons of steel in the ship would be highly profitable.²⁵⁵

In France, a court had originally allowed the transportation of the vessel to India for dismantling, since French authorities declared the ship to be decontaminated of all toxic materials including 115 tons of asbestos.²⁵⁶ However, the authorities did state that 45 tons of asbestos-containing materials might still be on the ship. The authorities also argued that, because this was a military vessel and had sovereign immunity, it would not fall under the 1999 Basel Convention or the European Waste Shipment Regulations, and, therefore, should not be considered a waste.²⁵⁷

The Indian Supreme Court invited the French company Technopure, which had decontaminated the ship, to appear before the Court and provide details on the situation.²⁵⁸ Technopure claimed that they removed 70 tons of asbestos from the ship, but there was still at least 500 tons still on board that could and should be removed in France.²⁵⁹

Consequently, a higher French court overturned the decision of the lower court to send the ship to India and the French President recalled the ship to French waters, where it presumably still resides.²⁶⁰ The ship's ultimate fate is currently unknown.

IX. WHERE ARE WE TODAY—ARE WE THERE YET?

Much has changed in the world since the early days of shipbreaking management, when “out of sight, out of mind” was the mantra for the disposal of aged shipping vessels. It once seemed justifiable to send such wastes to anyone who wished to pay to take the material. The developed world may have known or, perhaps, did not care if those countries and individuals had the ability to properly manage the materials. The attitude seemed to be *caveat emptor*—let the buyer beware. However, with the present global awareness of the challenges and threats that shipbreaking

254. *Id.*

255. Sonak, *supra* note 55, at 151.

256. *Id.*

257. *Id.* at 152.

258. *Id.* at 151.

259. *Id.* at 152.

260. Sonak, *supra* note 55, at 152.

poses, it is irresponsible, unethical, and unreasonable to turn a blind eye to the environmental and human impacts of any country's improper management of these wastes.

In 2009, U.S. EPA Administrator Lisa Jackson signed a final rule revising regulations on transboundary hazardous waste shipments between countries to make the current U.S. regulations more consistent with the international standards, including the OECD agreement.²⁶¹ This new rule will also affect RCRA, better aligning its application with the Basel Convention agreement.²⁶²

The E.U. also has plans to implement new Ship Recycling Convention rules by 2015, which would require that inventories of hazardous waste materials be compiled for ships to be sent for scrapping, and would require shipbreaking yards to demonstrate their ability to properly manage those inventoried wastes.²⁶³

However, despite international recognition of the need for greater oversight and regulatory protection of the environment, and the apparent beginnings of a united international approach, not everyone is happy with the changes that are on the horizon. For example, shipbreaking industry representatives from India, Pakistan, and Bangladesh have organized to form a common front to lobby their governments not to ratify the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships agreement.²⁶⁴ As mentioned previously, this agreement was drafted by the IMO with a key goal of improving environmental and worker safety standards for the shipbreaking industry to level the playing field between developed and developing countries.²⁶⁵ Pravin Nagarsheth, president of the Iron Steel Scrap and Shipbreakers Association of India, believes the Convention will make shipbreaking using the beaching method impossible, and thereby put an end to the industry in South Asia.²⁶⁶ Instead, he favors individual governments regulating environmentally sound and labor-safe scrapping methods—in direct opposition to the intent of the HKC agreement.²⁶⁷

261. Ari Natter, *Hazardous Waste, Rules Revised for International Shipments to be Consistent with Other OECD Countries*, 246 DAILY ENV'T REP. A-4 (2009).

262. *Id.*

263. EUROPEAN COMMISSION, DIRECTORATE-GENERAL ENVIRONMENT AND CLIMATE ACTION, RECOVERY OF OBSOLETE VESSELS NOT USED IN THE FISHING TRADE (2011), available at http://ec.europa.eu/environment/waste/ships/pdf/Guide_Re.pdf.

264. Ari Natter, *supra* note 261.

265. *Id.*

266. *Id.*

267. *Id.*

X. WHERE DO WE GO FROM HERE? RECOMMENDATIONS FOR THE FUTURE

Given the global nature of the shipbreaking industry, the complexity of waste materials and their management, and the overlapping and tangled national and international regulatory structures currently in place, there is a need, as well as a unique opportunity, for an international legal regime to be developed.²⁶⁸ A unified, integrated approach to the variety of current regulatory schemes would seem to be the most practical way forward. The IMO and HKC are currently the most comprehensive and progressive schemes to date, but are still lacking global acceptance and enforceability. Any unified approach should include the following elements:

- Creation of a single international set of environmental regulations comprising all the successful aspects of the various national and international regulatory schemes currently in place. Coordinated ratification will be required from a majority, if not all, of the ship building and ship recycling countries. Should a country choose not to participate, then ships from participating states should not be permitted to be sent to or received from such a non-member state without increased regulatory oversight or cost to the ship owner.
- Creation of an International Environmental Policing Task Force to enforce this new international environmental program. The task force would have the ability to inspect ships, shipbreaking facilities, and the associated recycling processes for compliance with the international regulations. The task force would be comprised of members from all the states that are a party to these regulations and would possess the policing powers for enforcement of the regulations, including referring cases to the international environmental court for further litigation.
- Creation of an international environmental court with jurisdiction for transboundary transportation of hazardous waste in all forms, including the hazardous waste on ships as well as the ships as hazardous wastes themselves. If hazardous waste is transported across

268. PUTHUCHERRIL, *supra* note 10, at 52.

national boundaries, then it will fall under the purview of this court, which will be charged with enforcing the international environmental regulations, similar in function to the Hague in Brussels.

- Expanded policing and use of the current export/import agreement documentation scheme already in place under the OECD agreement. This would involve notification by the exporting state of the ship to the importing state of the ship for shipbreaking. The importing state would need to agree to accept the ship for demolition and be able to demonstrate the ability to manage the types of materials that would be present on the ship in a manner that is protective of human health and the environment. It would be the responsibility of the exporting state to ensure that the importing state was able to handle these materials and it would be the responsibility of the importing state to ensure that the exporting state's ship does not contain materials not disclosed. Documentation of these transactions would need to be maintained and verified by each state's governmental agency assigned for this responsibility. These documents would need to be made available to the International Environmental Policing Task Force for compliance review.
- Require all hazardous materials to be removed from the ship prior to demolition, regardless of whether the ship is being sent from a signatory state or not. The cost of removal of these materials would be the responsibility of the current ship owner. This would place the financial burden of cleanup upon the last owner and would reduce the current process of selling off the ship to an intermediary who only reaps the financial rewards for the demolition. That intermediary would have to pay for the cleanup or charge the previous ship owner for the cleanup of the ship. Either way, the ship would no longer be just a financial gain, but also a financial responsibility for cleanup.
- Establishment of a consistent international system for discriminating hazardous waste for disposal from hazardous waste for reuse or recycling. Materials that are to be used as second hand products with little or no

refurbishing should be designated as recyclable. Those materials that are not to be reused as second hand products should be designated as waste. Lastly, items that are not to be used as second hand products, but have components able to be salvaged, should have a designation such as “recyclable waste material.” These three categories of hazardous materials would eliminate the current confusion concerning when a material is a waste or not, and would afford states the ability to make better educated decisions regarding the types of materials they wish to export, transport, or import including ship waste and waste ships.

- Establishment of a mechanism to ensure states and their hazardous waste processing facilities (whether recycling, salvaging, or disposal) meet international standards for environmentally sound and labor-protective processes. It would be the responsibility of the International Environmental Policing Task Force to enforce compliance.
- Establishment of an intellectual exchange program for developed countries to provide knowledge and support to developing countries for methods in shipbreaking, ship recycling, and proper management and disposal of hazardous wastes in an environmentally safe and worker-protective manner.

These recommendations, in conjunction with the IMO guidelines and HKC agreement, would provide a solid framework that ship builders, ship owners, and shipbreakers could rely upon for consistent and level regulatory oversight and enforcement. The playing field would be equal in all aspects and for all participants.

It may be argued that market forces should be allowed to dictate how and where ships are demolished. Subsidies to those states that use methods of demolition that are protective of human health and the environment would make those locations more attractive. However, it should be evident from this research that this has not been the case. Market forces have taken us to where we are today because market forces are interested in financial gain, not necessarily the loftier goals of human health and environmental protection.

Another argument has been to require the original purchaser of the ship to provide financial assurance that travels with the ship to cover the costs of

demolition. However, a mechanism to manage such a financial assurance trust fund, much like the now defunct Superfund,²⁶⁹ seems even more fraught with bureaucracy and management issues.

While international agreements are only binding on those states that choose to become signatories, and some states may choose to be a signatory with reservations, or some states may choose not to participate at all, a concerted effort, much like the world saw during the banning of chlorofluorocarbon (CFC), is not so far-fetched. We are a global community, able to work together to coordinate a worldwide ban on CFCs, even if some states did not experience the same effects as other states, with

269. See *Superfund Enforcement*, U.S. ENV'T'L. PROT. AGENCY, <http://www.epa.gov/compliance/cleanup/superfund/index.html> (last updated Oct. 21, 2011) (describing program finding parties responsible for site contamination and negotiating clean up). Superfund is part of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), a United States federal law designed to clean up sites contaminated with hazardous substances. *Id.* CERCLA created the Agency for Toxic Substances and Disease Registry, and it provides broad federal authority to clean up releases or threatened releases of hazardous substances that may endanger public health or the environment. *Id.* The law authorized the U.S. EPA to identify parties responsible for contamination of sites and compel the parties to clean up the sites. *Id.* Where responsible parties cannot be found, the Agency is authorized to clean up sites itself, using a special trust fund. *Id.* During the early part of the 1980s, 16 of the 799 Superfund sites were cleaned up, and \$40 million of \$700 million in recoverable funds from responsible parties were collected. *Id.* The Superfund Amendments and Reauthorization Act of 1986 made several important changes and additions to CERCLA, including increasing the funding of Superfund to \$8.5 billion and providing for studies and the use of new technologies. *Id.* In 1994, the Clinton administration proposed a new Superfund reform bill, which was seen as an improvement to existing legislation by some environmentalists and industry lobbyists. *Id.* However, the effort was unable to gain bipartisan support. *Id.* As of November 29, 2010, there were 1,280 sites listed on the National Priority List, an additional 347 had been delisted, and 62 new sites were proposed. *Id.* Approximately 70% of Superfund cleanup activities historically have been paid for by parties potentially responsible for the cleanup of contamination. *Id.* The only time cleanup costs are not borne by the responsible party is when that party either cannot be found or is unable to pay for the cleanup. *Id.* For those sites, the Superfund law originally paid for toxic waste cleanups through a tax on petroleum and chemical industries. *Id.* The chemical and petroleum fees were intended to provide incentives to use less toxic substances. *Id.* Over five years, \$1.6 billion was collected, and the tax went to a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites. *Id.* The last full fiscal year in which the Department of the Treasury collected the tax was FY1995. *Id.* At the end of FY1996, the invested trust fund balance was \$6.0 billion. *Id.* This fund was exhausted by the end of FY2003; since that time funding for these orphan shares has been appropriated by Congress out of general revenues. See generally *Superfund Amendments and Reauthorization Act Overview*, U.S. ENV'T'L. PROT. AGENCY, <http://www.epa.gov/superfund/policy/sara.htm> (last updated Dec. 12, 2011) (providing background about Superfund Amendments and Reauthorization Act of 1986); see generally Memorandum from John B. Stephenson, Dir., Natural Res. and Env't, to U.S. Senator James M. Jeffords, Ranking Minority Member, Comm. on Env't and Pub. Works (Feb. 18, 2004), available at <http://www.gao.gov/new.items/d04475r.pdf> (providing updated appropriation and expenditure data for Superfund program).

minimal international agreements.²⁷⁰ So why not in this instance? This is a global issue and we all have a stake in ensuring a positive outcome, regardless of where a state is in the chain of demolition. Globally, we need to be protective of human health and the environment for all states, including our own. No one wants to be unsure of whether products or fish they may be consuming have been contaminated with hazardous materials. Everyone has a right to a clean and safe environment.

CONCLUSION

As a global community, we are certainly on the right track to ensure the safe management of shipbreaking in a manner that is protective of both people and the environment. We have come a long way from the days of allowing solely market forces to drive the final destination of ships containing and/or comprised of hazardous materials. While we may have more ground to cover in drafting and ratifying an integrated set of international regulations into a solid legal document with universal enforcement capabilities and incentives, this goal is clearly in sight in the near future.

It is easy to dismiss the hard decisions each nation must make in taking responsibility for shipbreaking as political ideologies. It is easy to overlook the fact that mismanaged shipbreaking can impact the health and environment of us all. Questions such as, “who are we to impose our value systems on the backs of another country?” or “aren’t we providing other countries with resources and second hand goods they so desperately need?” have political and ethical issues that divide us globally.

The hard reality is that environmental degradation resulting from mismanaged shipbreaking ultimately has no borders; it pollutes equally. Pollution does not remain within the arbitrary political boundaries of a particular country’s borders. The pollution that occurs in one country and contaminates the plants, animals, and people can easily travel in water, food crops, marketed meats, or even donated organs to the unsuspecting recipient. We may be eating the same heavy metals taken up in leafy vegetables that arrived in our local grocery that were grown on land where a vessel was sent to be dismantled on a far off beach. We may be enjoying a steak or seafood meal in a restaurant or in our homes that derives from those same distant and polluted shores.

270. *The Montreal Protocol on Substances that Deplete the Ozone Layer*, THE OZONE HOLE, <http://www.theozonehole.com/montreal.htm> (last visited July 22, 2012).

We have an opportunity to make a change in our global regulatory structure to create a legal framework that will effectively manage the shipbreaking industry, but it will require the cooperation of the entire international community. We should set aside our individual disagreements and sometimes nationalistic, myopic viewpoints for the protection of the global population and the environment. Certainly, we have been able to address challenging global environmental issues in the past, as seen in the success of the ban on CFCs. We are very close to an international solution on shipbreaking, and, optimistically, we will see improvement in the way the industry is managed within the next decade, if not sooner!