

Vessel Scrapping Industry–Its Future in Bangladesh

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ABSTRACT

Vessel scrapping is a growing activity in developing countries to acquire much needed steel and to create jobs. The industry is constantly moving from one region to another with a continuing degradation of working conditions, and with no mechanism to prevent severe environmental damage. Bangladesh has one of the largest vessel scrapping industries in the world where approximately 150 ships are dismantled every year on the beaches of the port city of Chittagong. This conceptual paper discusses the saga of vessel breaking, the scope of its operations, the absence of public policy framework to guide its operations, and finally, suggests the measures to be taken to address vessel scrapping in Bangladesh.

Keywords: Vessel Scrapping, Bangladesh, Employment, Environment, Classification, Recycling

INTRODUCTION

The vessel scrapping industry has been around for hundreds of years. It initially took place in present-day developed countries such as the United States and the United Kingdom. Over the years, these countries have become strict on regulatory policies since vessel scrapping not only pollutes the environment but also possesses major health risks for labors dismantling the ships. As a result, developed countries banned vessel scrapping. When this took place, it was the developing nations such as Bangladesh, India, and Pakistan that took over vessel scrapping. As a matter of fact, Bangladesh has been one of the top nations for such activity until it was banned for a whole year.

Most developing countries similar to Bangladesh have many rules and regulations in place. However, these policies are hardly ever enforced properly due to corruption especially in the government. Sadly, the vessel scrapping industry had to suffer for a year because of it. Thus, this paper discusses the vessel scrapping industry in Bangladesh from an economic, environmental, humanistic, and legal factor concluding that the industry has not added much value to Bangladesh.

The methodology of this conceptual paper was based on generating information from various sources such as books, newspapers, journals, and reputable web sites. The authors' intention in originating this paper provides guidance to policy makers and government officials on the importance of a vibrant scrapping industry in Bangladesh.

BACKGROUND

Ships, like all physical assets and living beings, deteriorate as they age. They are maintained to remain in a seaworthy condition as long as their value in being "fit for service" exceeds their salvage value. While the decision of whether to scrap resides with an owner, the decision on whether a vessel is seaworthy and fit for service does not—that is the responsibility of classification societies.

Marine insurance underwriters originally founded classification societies to keep track of the seaworthiness of their insured vessels. The first classification society started in the early 1700s at Lloyd's Coffee House with a list describing the details of vessels. In 1764, the list became the first Register of ships that classified vessels according to their quality of seaworthiness. In the 1800s, this became the Lloyd's Register, which was followed by others such as the American Bureau of Shipping. A vessel is said to be "in class" when it passes an inspection that encompasses all aspects of a vessel's physical condition. The role of classification societies expanded in the wake of the *Titanic* disaster to encompass crew and passenger safety; this tragedy gave birth to the Safety of Life at Sea (SOLAS) international convention. In recent years, classification societies have been given the further mandate to ensure that shipboard and shore side operations are in compliance with international conventions. The two principal international means are the International Convention on Standards of Training, Certification, and Watchkeeping, which entered into force in 1984 and the International Safety Management Code, which was incorporated into the SOLAS Convention in 1994.

There is no way for an owner to operate a vessel without being in class. Flag states require that a vessel remain in class to be officially registered and entitled to fly their flags. Commercial ports will deny permission for entry and charterers

and shippers will not enter into contracts with a vessel not properly registered with a flag state. Thus a vessel that is not in class cannot be insured, fly the flag of a nation, be granted permission to enter ports, or obtain contracts to carry a cargo.

Surveys occur annually while more detailed, "special", surveys take place every 4 to 5 years. A ship-owner is obliged to correct serious deficiencies found in these surveys or risk having his vessel fall "out of class". The fourth and fifth special surveys, which occur when a vessel is about 20 and 25 years of age, are critical points in a vessel's life as these take a very close look at the thickness of steel in a vessel's hull.

Ships are built with a minimum thickness of hull steel to be in class when delivered from a shipyard. But this does not mean that the vessel will remain in class as seawater corrosion reduces the thickness of hull steel over time. Some owners prefer to invest a greater amount of capital during vessel construction for thicker hull steel in order to increase its useful life. Owners who opt for the minimum hull steel thickness when a ship was built, or who do not properly coat the hull to protect against seawater corrosion, face a moment of truth during the fourth and fifth special surveys. A substantial replacement of hull steel, which can easily exceed \$10 million, plays a key role in an owner's decision to either continue operation or scrap a vessel. If the market is strong enough to justify the investment in steel replacement to extend a vessel's life to the next special survey, then the vessel is given a new lease on life; if not, it is taken out of service. Once out of service, the vessel is either laid up or scrapped to recover its salvage value.

Recently, a new factor has entered the picture: mandatory phase-out of single hull oil tankers under the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (Marpol 73/78) and as amended at the 50th session of the International Maritime Organization's Marine Environment Protection Committee in December 2003. The timetable for phasing out single hull tankers is approximately their 25th year of service. However, regardless of market conditions, Marpol regulations, special surveys or anything else that may affect the scrapping decision, relatively few ships make it much past 25 to 30 years of age as seen in the following table (European Commission, 2004):

Table 1: Average Lifetime before Scrapping

Vessel Type	Years
Container	25.4
Bulk Carrier	25.7
Tanker	26.1
Passenger	27.1
Gas Carrier	29.3

The current scrapping rate is about 700 vessels per year. With about 45,000 vessels of all types sailing on the high seas, a forecast of scrapping activity can be derived by assuming that vessels are scrapped as per the above table. On this basis, scrapping activity is expected to decline marginally over the next ten years from that of the early 2000s to 600-700 vessels per year before increasing again after 2015.

Historically, scrapping of merchant vessels took place in dry docks of the United States Gulf, northern Europe, and Japan. The process started with removal of the still serviceable and resalable items such as navigation, communication and lifesaving equipment, pumps, valves, spare parts, supplies, and anything containing valuable metals such as copper (electrical cables), nickel (equipment components), and bronze (propellers). The vessel was then prepared for dismantling by first ensuring that oily residues were removed and the cargo holds were gas-free to prevent the presence of an explosive mixture that could be ignited when cutting into tanks. The vessel was then placed in a dry dock. Large industrial-sized cutting torches dismantled entire sections of the ship that were lifted out of the dry dock by cranes. These sections were further reduced in size by mechanized cutting torches and transferred by lifting equipment to truck or rail for shipment to steel mills as feedstock for electric arc furnaces; steel is one of the world's most recycled commodities as very little is actually discarded.

RESEARCH DESIGN

The study is exploratory in nature. Vessel scrapping is a growing activity in developing countries to acquire much needed steel and to create jobs. The industry is constantly moving from one region to another with a continuing degradation of working conditions, and with no mechanism to prevent severe environmental damage.

The examples (cases) of vessel scrapping reporting in the ship breaking industry in Bangladesh are provided and critiqued. We reviewed the annual reports to identify whether the reports appeared to reflect a particular environmental perspective or were of a particular nature (e.g. environmental, gender focused etc.). Content analysis was used to classify the disclosures into various environmental categories. Hackston and Milne (1996) used six categories: environment, energy, human resources, product and safety, community involvement, and other. A technique commonly used in environmental responsibility research to measure the significance of content is count the number of words used to describe a particular issue (Hackston & Mile 1996). As our study is exploratory in nature and is limited to Fauzdarhat beach in Chittagong,

Bangladesh, instead, to identify the instances of environmental responsibility reporting and attempted to achieve a sub-classification of issues relevant to the green re-cycling.

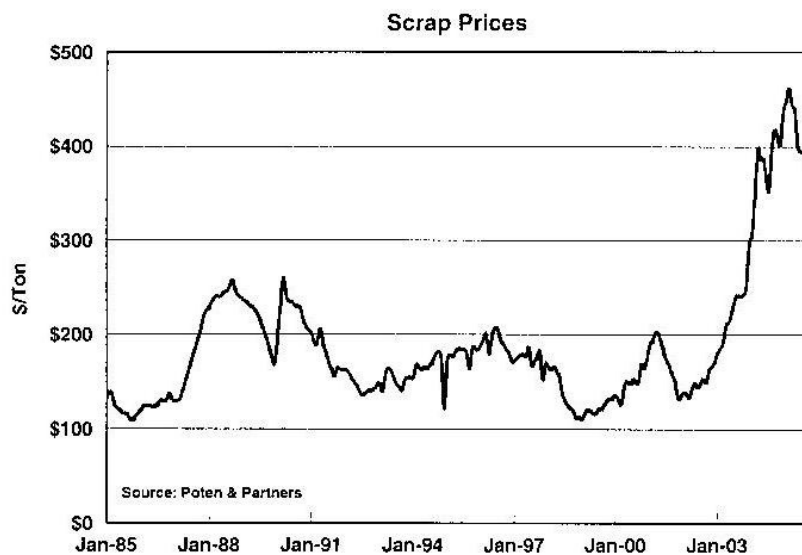
Examples of ethical practices such as protection of consumers, protection of creditors, establishment of rights of shareholders and enforcement of law and order situation are important indicators of environmental governance of any country, particularly in developing countries such as Bangladesh. Bangladesh has one of the largest vessel scrapping industries in the world where approximately 150 ships are dismantled every year on the beaches of the port city of Chittagong. This paper discusses the saga of vessel breaking, the scope of its operations, the absence of public policy framework to guide its operations, and what can be done to address vessel scrapping in Bangladesh.

The Roving Mortician

In the early 1970s, Spain entered the ship scrapping business. Its low labor costs enhanced the value of vessels destined for scrapping versus vessel scrapping yards in northern Europe, the United States, and Japan, all of which were encumbered with high labor costs. Thus ship-breakers in Spain could outbid traditional vessel scrapping yards and became the “morticians of choice” for many ship owners. Spanish dominance was, however, short-lived. As a result of even lower labor costs, the ship mortician business migrated to Taiwan in the late 1970s and to South Korea in the 1980s. The planned, orderly, and organized vessel scrapping methodology followed the transfer of business from the Western to the Eastern Hemisphere. The experience gained in training workers and managers encouraged these nations to abandon vessel scrapping in favor of more profitable shipbuilding.

By the early 1990s, China, with its even lower labor costs, became the center of the ship vessel scrapping business but not for long. China imposed import duties on ships to be scrapped as a source of revenue for the government. Even with these duties, China, with its low labor costs, could outbid Taiwan and Korea for vessels intended for scrapping. But vessel scrapping was not an objective of the national economic plan and was viewed in an unfavorable light by government planners. China did not react to its relatively high ship import duties opening the door for even lower labor cost nations in South Asia to enter the vessel scrapping business. Unlike China, South Asia viewed vessel scrapping not only as a new business opportunity offering employment for some of its huge under-employed labor force but also as a source of steel. A major product of steel scrap in Asia is ribbed reinforcing rods and bars, or rebar, used in concrete

construction. Rebar allows strength to concrete roads, bridges, and buildings to bear loads and withstand earthquakes; occupants of concrete buildings containing reinforcing rods have a much greater chance of surviving an earthquake than those without. Buildings with reinforcing rods tend to buckle rather than collapse. A tanker is reduced to 77% rebar steel, 8% steel melted to make various products, 2% cast iron scrap, 1% non-ferro metals, 3% machinery, and 9% waste. Wastes include asbestos, glass wool, rubber, fiberglass, PVCs, cable, oily sludge, cementing material tiles, wood, glass, and toxic chemicals (Greenpeace, 2009).



With most scrap steel made into rebar, the price of scrap is determined by the price of “virgin” rebar; that is, rebar made in a steel mill. Rebar made by hot- or cold-rolling scrap metal into rods or bars is of a lower quality and sells at a discount to “virgin” rebar. Ship-breakers bid for vessels on the basis of the amount of steel in the ship and the value of rebar net of ship import duties and the cost of dismantling the vessel. With the escalation of steel prices in recent years, the value of rebar has increased, and so, too, the scrap value of vessels.

About 90% of a vessel’s contents are salvageable and steel represents about 80% of the salvageable value of a scrapped vessel. In 2002, when scrap steel was \$125 per ton, the scrap value of a large crude carrier with a LDT use lightship weight of 35,000 tons of steel was about \$4.4 million; in the last quarter of 2004, at \$400 per ton, it was \$14 million. Due to this, an individual could have, at least in theory, purchased a tanker in layup, waited two years, and sold the vessel for about three times the original investment.

As mentioned, the high import duty on scrapping vessels in China opened the door for Bangladesh, India, and Pakistan to enter the ship scrapping business, but with a dramatically different approach.

From Order to Disorder: The Case of Bangladesh

In South Asia, no dry docks or cranes or lifting equipment are employed in dismantling a vessel nor is scrapping carried out in a planned and organized way. One of the most notorious examples of order to disorder can be seen in a ten-mile stretch of Fauzdarhat beach in Chittagong, Bangladesh, where thousands of impoverished workers are engaged in dismantling upwards of vessels lined up side by side in various stages of dismemberment.

Ship scrapping began in the 1960's in Bangladesh when the MD Alpine, a Greek ship beached on the shore in Sitakund, Chittagong, after a cyclone was eventually scrapped by Chittagong Steel House. In 1971, Al Abbas, a Pakistani ship, destroyed during the Liberation War, was sold in 1974 for scrapping by the Karnafully Metal Works. This marked the beginning of the commercially successful ship breaking business in Bangladesh (YPSA, 2009).

A vessel remains offshore on Fauzdarhat beach awaiting its final instructions after being sold to a ship breaker. During high tide, the vessel is directed to head towards a specified location on the beach at full speed. Once beached, under-paid and untrained workers descend on the vessel like a horde of ants dismembering a beetle. One group has small cutting torches to reduce the vessel to large segments that fall on the beach. Then another group reduces the large segments to a size that can be hand-carried across the beach to collecting points by gangs of workers. There the scrap metal is manually loaded on trucks and taken to nearby facilities where it is heated and reshaped or cold rolled into rebar.

There is total disregard for elemental safety precautions at all steps in dismantling the vessel and in manufacturing rebar. The workers wear no heavy rubber boots with metal inserts to protect their feet or hard hats to protect their heads from falling objects. They wear no masks to guard against toxic fumes or goggles to protect their eyes from sparks when cutting metal. Potential snapping of frayed cables used to winch a vessel higher on the beach to facilitate dismemberment adds another element of danger. The general uncoordinated and seemingly chaotic approach to ship breaking fuels the number of accidents and fatalities (Langewiesche, 2005). About 41% of the ship breaking labor community is between the ages of 18 to 22, while 1% of labor is between 46 to 60 years old. While women are not employed in this industry, children are. Child labor under the age of 18 makes up 11% of the labor force (YPSA, 2009).

Every year approximately 600 ships are sent to yards to break them in pieces to be recycled. In recent years, more vessels are being scrapped in China, where a more traditional organized approach to scrapping is employed. Presently, Bangladesh is the largest ship scrapping country processing over 60% of large ocean-going vessels in 2007. This national industrial activity is located along the shores of the City of Chittagong. Every year around 150 ocean-going ships, of average weight between 10,000 tons and 550,000 are scrapped on the beaches of Chittagong using little more than the bare hands (will be supported by visuals) of contract workers or “independents”; the latter group sell their output to metal mongers. The industry process annually 1.8 million tons of scrap metal which is sold to re-rolling mills that uses the output to manufacture products that serve other industries; e.g. 1.3 million tons of construction metal rods. Through backward and forward linkages the vessel scrapping generates approximately 1.3 million jobs, of which a significant number are filled by school age children. Internationally, Bangladesh is one of the leaders in this industry.

Public Outcry

The non-government organization Greenpeace (2009) became interested in the ship mortician business after an explosion on May 31, 2000 within the bowels of the 370,000 Dwt (deadweight) Ultra Large Crude Carriers (ULCC) *Dena*. As mentioned, tankers are supposed to be gas-free before they are broken up; that is, their tanks vented and free of dangerous fumes from cargo residues. Careless cutting into a tank filled with an explosive mixture gas caused the loss of 20 lives. On June 14, 2000, the ULCC *Tanko* experienced an initial explosion, a precursor of a second that was felt 15 kilometers away and resulted in the death of 25 workers.

Greenpeace has been active in focusing public awareness of the abysmal working and living conditions and the utter disregard of safety precautions of scrapping activities in Bangladesh. Ship scrappers work long hours under hazardous conditions with no access to clean drinking water, healthy food, or sanitary toilets. Moreover, they are paid poorly; for every 12 hours of work, they are paid 300 taka, equivalent to about \$4.38. In addition to this, workers do not wear protective gear such as helmets and boots, which, along with the heat of cutter flames and constant hammer banging, can leave workers with permanent physical and mental problems. Scrap workers may also suffer from cancer, ulceration, sterility, and deafness (Rahman & Tabarak, 1999). The majority of workers do not receive any medical treatment nor do employers provide hospital facilities. Furthermore, scrap workers are unable to become a part of or form a trade union. Clearly, the Factory Act of 1965, to protect workers and environment, is not applied in this profitable industry. The Labor Law Act of 2006 was passed to address these issues, but the effectiveness of this law remains

questionable. More recently, the Bangladesh High Court ordered for the closure of all 36 shipyards within two weeks until they receive government clearance on environment pollution. The court also banned the entrance of ships containing toxic material in Bangladesh earlier this year (Herman, 2009).

Research by one of the influential organizations of Bangladesh, the Young Power in Social Action (YPSA), concluded that ship breaking has impacted Bangladesh in the following ways:

- Discharged pollution from ship scrapping include lead, cadmium, organic tin, arsenic, zinc, chromium, various types of oil (engine oil, bilge oil, hydraulic and lubricants oil, grease, tanker cargo oil), chemicals and their associated fumes adversely affects the environment;
- Persistent organic pollutants stay in the environment for a long period of time dispersing throughout the food chain in the fatty tissue of living organisms affecting humans, wildlife, and the environment;
- Asbestos, an insulator in older vessels, inhaled by workers can result in cancer and asbestosis, which would not occur if there were a proper asbestos disposable procedure;
- Heavy metals found in paints, coatings, anodes, and electrical equipment of ships separated without any protective gear can result in cancer of the lung, skin, intestine, kidney, liver, and bladder as well as damage to blood vessels;
- Spilled oil residues mix with ocean water forming oil films reduce light penetration that restrains photosynthesis and harms aquatic life which in return affects humans via consumption of seafood;
- Adverse physiochemical properties of seawater cause toxic ammonia and a high PH level;
- Ship parts mixed in the sand affect inter-tidal sediments and soils, where accumulated metal fragments and iron rust lead to accelerated shore erosion and increased turbidity of sea water and sediments;
- Biodiversity in the coastal region is adversely affected by the discharge of ammonia, burned oil spillage, floatable grease balls, metal rust, and other disposable materials, which also damages the environment of the coastal inter-tidal zone and its habitat.

Housing consists of an assigned bunk in a shanty close by the beach with no bathroom facilities. The mosquito and fly infested air, stinking of fecal matter and fumes from burning waste and re-rolling scrap, is filled with industrial dust including toxins and asbestos. Yet, despite the ill-effects of ship breaking on the health and physical well-being of the workers, they continue to migrate to these

vessel graveyards from the poorest regions of Bangladesh, India, and Pakistan. The portion of the pay sent home, which can be as little as only a few dollars per day is the primary means of support for their families.

No documentation exists on the long-term health effects of working and living in the midst of what amounts to a toxic and societal waste dump. While there have been court decisions and governmental mandates issued from time to time for scrapping to be conducted in accordance with safe operating procedures, the only visible concern displayed by these governments is the timely payment of ship import duties.

While some sludge and oily residues are captured for recycling, enough escape from cargo tanks and the bilges of engine rooms to saturate the beach sand and pollute adjacent waters. Oily residues and toxic substances in offshore waters have decimated local fishing. Toxins released to the environment include polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs), polybrominated biphenyls (PBBs), polyvinyl chloride (PVCs), and polycyclic aromatic hydrocarbons (PAHs) found in hydraulic systems, electrical cables, and floor coverings. Other toxic materials include asbestos in insulation, anti-fouling paint containing mercury, cadmium, arsenic, and tributyl tin (TBT) plus anti-corrosion paint containing lead oxide and zinc chromate. Burning waste for disposal releases toxins directly to the atmosphere, exposing workers to a variety of potential ailments. Besides burning, asbestos insulation, when broken, releases dust to the atmosphere that can lodge in the lungs leading to irreversible scarring of lung tissue and/or cancer of the lung, chest or abdominal linings. On average, one worker dies in the yards a week and everyday a worker is injured (Rahman & Shahin, 2007).

Legal Aspects of Chaotic Scrapping

The irony of the situation is that, as of May 2006, 168 nations have signed the Basel Convention (2009) on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (the "Basel Convention"), which entered into force in 1992. This Convention designates PCBs, PCTs, and PBBs, asbestos and leads as hazardous materials whose transboundary movement and ultimate disposal must be accomplished in an environmentally sound manner. Individual signatory nations are free to enter into bilateral or multilateral trans-boundary waste agreements independent of the Basel Convention as long as these agreements call for an environmentally sound method of disposal. In 1993, the EU banned the export of hazardous materials for recycling, which was followed by the prohibition of the export of hazardous wastes from OECD to non-OECD nations for any purpose (EU Regulation, 1993). In 2004, concern over the environmental consequences of ship breaking activity in South Asia, made public

through the efforts of Greenpeace, prompted a proposed change to the Basel Convention for a more stringent prohibition with regard to the export of hazardous wastes contained in ships destined for recycling. However, this measure was not approved as opposing nations preferred that the International Maritime Organization (IMO) assume direct responsibility of regulating vessel dismantlement through an international convention.

The United States, while a signatory to the Basel Convention, has not taken the necessary steps to ratify the convention. However the United States is bound by OECD decisions with regard to the shipment of hazardous materials that include the prohibition of the movement of hazardous wastes from OECD to non-OECD nations. Other conventions may be violated, at least in spirit, by the export of ships with hazardous or toxic materials for recycling. But all this is moot because the U.S. Environmental Protection Agency banned the export of PCBs for vessel disposal under the authority of the Toxic Substances Control Act of 1976 as amended. One of the consequences of this ban is the necessity of the Maritime Administration (MARAD) and the U.S. Navy to find an alternative means of disposal for a fleet of obsolete defense related cargo carrying vessels and warships under their jurisdiction. These vessels, some of which are in danger of sinking at their anchorages from salt water corrosion of their hulls, are to be scrapped in U.S. facilities that dismantle vessels in an environmentally sound manner. However, this will represent a cost to the government versus being a source of revenue by selling these vessels to ship breakers in Bangladesh, India, and Pakistan. The European Union is facing the same problem, but not to the same degree of magnitude as the United States (Morita 722-753).

A laid-up vessel rusting away at its anchorage is considered an export of hazardous material if it is sold for scrapping overseas and is towed to its ultimate fate. Greenpeace wants any vessel, operating or inoperative, to be classified as an export of a hazardous material and fall under the auspices of the Basel Convention. The shipping industry counters that an operating vessel moving cargoes is not an export of hazardous material. A tanker destined for scrapping is normally an operating vessel that takes its last cargo to Singapore or other ports in South Asia. The ship discharges its cargo and cleans up the cargo tanks to obtain a gas-free certificate from a marine chemist certifying that the ship is gas free and ready for hot work. Excess bunkers over that needed to transit to a ship breaking anchorage are removed. The ship is sold and delivered to a ship breaker who takes legal title to an operating vessel. Of course, the ship will not be in an operating status for long, but its ownership transfer as an operating vessel does not qualify the transaction as an export of hazardous material.

Green Recycling

“Green recycling” is a term used by the shipping industry for the recycling of ships with due regard to the environment and to the health and safety of workers. This is not a return to the original practices associated with scrapping before South Asia entered the picture. Rather than scrapping being a source of revenue for an owner, green recycling will represent a cost. There are 80 dry docks capable of accepting vessels above 60,000 Dwt potentially capable of green recycling of which 30 are in Europe. European facilities involved in the decommissioning of offshore oil structures have gained the knowledge and expertise necessary for green recycling of ships. Green recycling is already in operation at one facility in Italy, one in Belgium, one in the Netherlands, two in China. Eight facilities in the United States are primarily engaged in recycling ships for the U.S. Maritime Administration and the U.S. Navy.

It continues to be more cost effective for owners of obsolete vessels to sell their vessels for scrapping in South Asia with no incentive on the part of local governments in South Asia to improve the standards of ship breaking. Nations with the lowest standards attract the greatest number of ships, and in so doing, benefit from ship import duties. However, some companies, wary of the adverse publicity from providing tonnage to South Asia yards, have elected to scrap their vessels in a more environmentally sound way in China. China for its part has reduced its ship import duty and is becoming more interested in pursuing ship recycling activities.

CONCLUSION

Ultimately, only the passage of an internationally supported international convention mandating an environmentally sound basis for dismantling vessels with due regard for worker health and safety standards and disposal of hazardous materials can counter the financial attraction of the system that now exists in South Asia. On May 14, 2009, the proposed International Convention for the Safe and Environmentally Sound Recycling of Ships was presented for ratification after five years of negotiations. If enacted, there would be a requirement for all vessels to carry a detailed inventory of hazardous materials from the time of construction until they are sent to recycling facilities known as the “Green Passport”. In addition, it will be mandatory for workers to be equipped with safety gear as well as for recycling centers to be properly equipped for the safe disposal of hazardous materials and have prepared emergency response plans. However, there are weak points in the Convention such as it fails to mention the handling of hazardous material by trained employees using modern safety gear

(Bradsher, 2009). Even if this Convention were ratified, there is doubt on whether Bangladesh will adopt this new standard for ship recycling because of a lack of funding. The country already suffered a year of no contribution from the vessel scrapping industry due to Bangladesh's High Court banning such activity until labor safety and environmental precaution has taken place. The government further made it mandatory by creating a committee to inspect the hazardous materials in ships as they enter the country (Greenpassport, 2011). On March 2011, Bangladesh has decided to reopen for vessel scrapping after a year of no such activity taking place. It has opened with many conditions such as ships not being able to enter the country possessing hazardous materials as per Lloyds List. While Bangladesh was closed for business, all of the ships went to China, India, and Pakistan. Hopefully, Bangladesh will be able to pick up the business and compete to be the first one like before.

Even though Bangladesh has changed and adhered to strict rules and regulations within the vessel scrapping industry, it still has a long way to go. It is imperative for Bangladesh to develop programs adopted by India such as the Dump Management System and the Training and Welfare Center. If Bangladesh decides not to invest in green recycling, the nation will no longer be a major player in the ship scrapping industry losing an important source of steel and a source of much needed jobs. This will have an impact on the economy as many Bangladeshis rely on the vessel scrapping industry to bring food to the table. Vessel scrapping is indeed a profitable industry that Bangladesh can have a bright future in; it just needs to make sure that the proper policies are in place so that the economy, the environment, and the citizens of Bangladesh can benefit from it.

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