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## Ship Breaking and its Future in Bangladesh

Jewel Das  
*University of Chittagong*

Muhammed Ali Shahin  
*YPSA*

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## 1.1 INTRODUCTION

Ship recycling aspects have been considered as a potential business since the dawn of mechanized operation though the history in Bangladesh is shorter. The dismantling of ships is sustainable from a purely economic point of view, but the potential consequences to the human and environment are some concerning issues. Before 1960, this practice was confined in some industrialized countries like the United States, the United Kingdom, Germany and Italy. Chronologically, in the next decade this industry and associated activities migrated to some semi-industrialized countries such as Spain, Turkey and Taiwan due to the availability of low-priced labor and steel market. Since 1980s, to enhance the monetary benefits from the industries, these activities had been introduced in the scrap yards of India, China, Pakistan, Bangladesh, the Philippines and Vietnam where health and safety standards are nominal and workers were more likely to engage themselves in laborious works. YPSA (Young Power in Social Action, an NGO) and World Bank studies found that 22,000 to 50,000 workers are employed at ship breaking yards in Bangladesh directly whereas the number is around 100,000 to 200,000 indirectly.

Bangladesh's shipbreaking industry emerged as a result of an accident. Following a severe cyclone in 1960s, a Greek ship 'MD Alpine' was stranded on the Chittagong shore near Sitakund, Bangladesh. The ship remained there for a long time before the Chittagong Steel House bought the vessel and scrapped it. During the Liberation War in 1971, a Pakistani ship 'Al Abbas' was damaged by bombing. It was later reclaimed and brought to the Fauzdarhat seashore. In 1974, Karnafully Metal Works Ltd bought it as scrap, introducing commercial shipbreaking in Bangladesh (Figure 1).

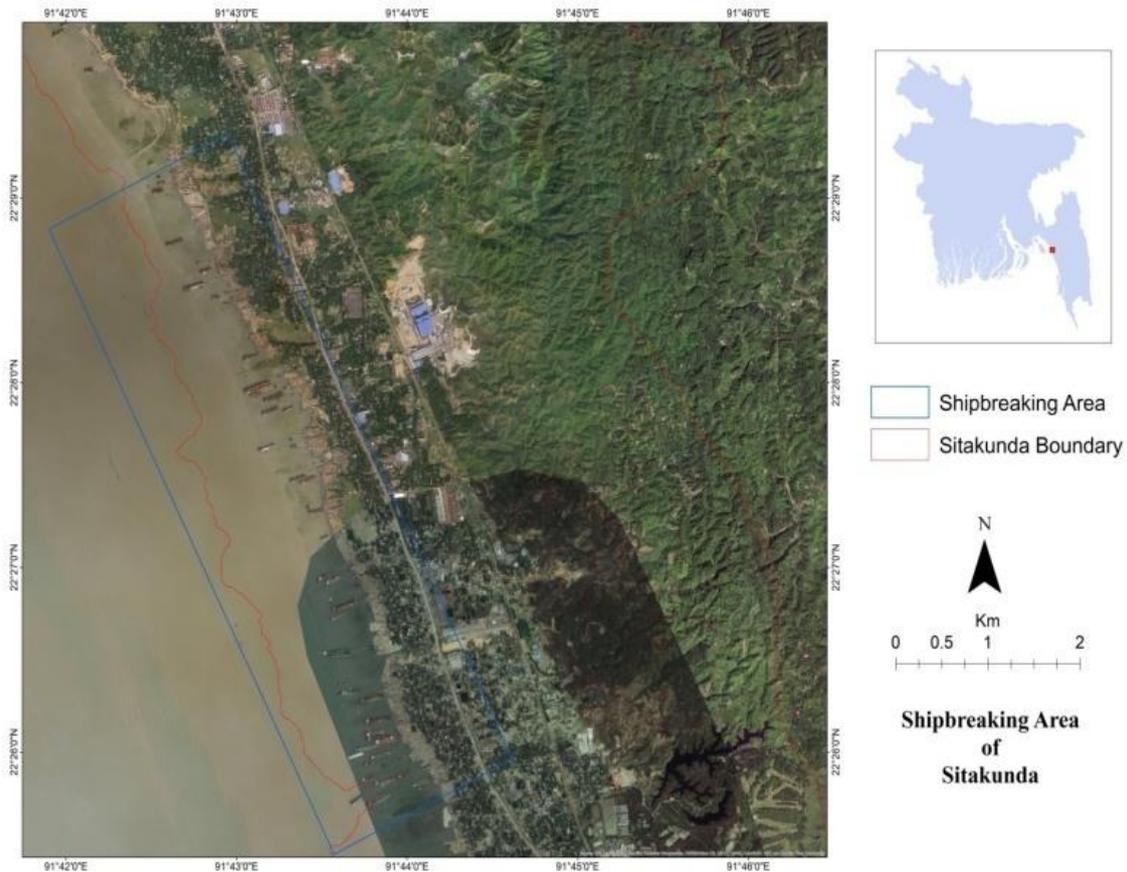


Figure 1: Ship Breaking Industries in Sitakunda, Bangladesh

The industry flourished during the 1980s. Hossain et al. (2008) stated that Bangladesh coast possesses higher tidal range, suitable intertidal zone for beaching large vessels, cost-effective labor and flexible environmental regulations. According to many reports, the ship breaking industry in Bangladesh is estimated worth an annual turnover of around 1.5 billion dollars in an average. It is estimated that approximately 30 percent of the world's Light Displacement Tonnes (LDT) were scrapped in Bangladesh during the period 2000-2010. Today it has become large and profitable industry for the nation. In 2015, a total of 21.80 million Gross Tons (GT) was recycled in the world and Bangladesh was the biggest ship recycler with 7.52 million GT (34.5%). (World Casualty Statistics 2015). In compare to the processes called sinking or abandonment, ship recycling is the most suitable and environment-friendly option as it ensures the reuse of obsolete vessels' steel. But, the recycling practices are hazardous industries that expose both their employees and the environment to potential risks. In South Asia, ship breaking is typically accomplished on the intertidal beaches where the grounding, pulling, cutting and breaking are performed. These activities do not comprise with safe working environment for the workers and have detrimental consequences to the associated environment in terms of pollutions. ILO (2004) claimed that ship recycling needs management of structural complexity. The environmental, safety and health issues likewise make shipbreaking a challenging operation. Scientific researchers have also stated that this industry has negative impacts on the local ecology through environmental contamination (Hossain and Islam 2006; Siddiquee et al. 2012; Abdullah et al. 2013; Rahman et al. 2016; Sharifuzzaman et al. 2016).

This paper attempts to delineate an overview of the ship breaking industries in Bangladesh, its potentialities and challenges, legislation issues, probable interventions to ensure a smooth sustainable business and eventually to explore the dimensions to connect this sector with blue economy concepts in Bangladesh. The following points will discuss about existing problems and aspects of ship breaking industries in Bangladesh along with pollution, hazard analysis and human right issues, international and national legal frameworks and policies, economic benefit from the sectors, problems and prospects, challenges and way forward to enhance sustainable ship breaking industries operation in Bangladesh.

## **1.2 PROBLEMS AND ASPECTS**

### **1.2.1 Existing Realities**

The authors of this article believe that there some positive changes are taking place in a few of the ship breaking yards but the situation has not improved in the rest of the industry. The ship recycling has been succeeded in supplying steel and other metals for reuse in industry. In some cases, it supplies newly emerged ship building industries of the country. However, this more than thirty-year old practice has will continue to contribute in hazardous material accumulation in its surroundings if it continues the current trend. Aktaruzzman et al. (2014) documented that ship recycling yards are responsible for higher concentrations of metal pollutants in yard-associated sediment textures. Ship recycling yards in Bangladesh usually employ beaching methods rather than a dry dock. It is a common demolition practice worldwide due to its cost-effectiveness and ease. Usually, ships are beached along the mudflats and dismantled using semi-skilled and unskilled labor forces. Finally, the dismantled parts are pulled to the nearest dry shore area by the help of electric winch and manual laborers. Gas cutting is commonly employed to reduce the bigger parts into small pieces (Hossain KA et al., 2015). End-of-life ships sent for breaking to South Asia contain hazardous materials that are potentially harmful to human health and the environment. Ships that today are broken on the beaches of South Asia are very likely to contain toxic materials in their structure. Accidental deaths in the yard are regular occurrence. The dismantling process requires a minimum standard of safety knowledge. Otherwise, there exists the possibility of explosion, injuries, disabilities and fatal deaths. On average, 10–15 workers die and 150 are injured every year in the Bangladeshi ship breaking industry. (Sujauddin et al. 2014; Bailey 2000; Andersen 2001). Currently, about 100 yards operate along the coastal areas in Sitakunda, mainly in Kumira, Bhatiary and Fouzdarhat. The yards reside in only about 4000 m<sup>2</sup> of land, representing very intense economic activity per square meter of land (Rahman and Mayer 2015). Hundreds of end-of-life ships are dismantled every year on the beaches of Sitakunda without sufficient concern for environmental protection and workers' rights in most of the yards.

### **1.2.2 Pollution**

Though ship breaking has earned a good reputation as a profitable industry in developing countries there are a number of environmental and human health hazards. It was found that on an average 95% steel are coated with 10-100 tons of paints which contain lead, mercury, zinc,

arsenic, chromium etc. PCBs, asbestos and huge quantities of oil cause environmental pollution when the ship is broken for scrap (Islam and Hossain, 2006). Ships also contain a wide range of other hazardous wastes (Figure 62), sealants containing PCBs, up to 7.5 tons of various types of asbestos and; several thousand liters of oil (engine oil, bilge oil, hydraulic and lubricants oils and grease). Tankers additionally hold up to 1,000 cubic meters of residual oil. Most of these materials have been defined as hazardous waste under the Basel Convention. In Bangladesh, ships containing these materials are being cut up by hand, on open beaches, with no consideration given to safe and environmentally friendly waste management practices in almost, all the yards. A worker working barefoot without any protective footwear Ship breaking activities is a threat to both the terrestrial and marine environment as well as to public health.

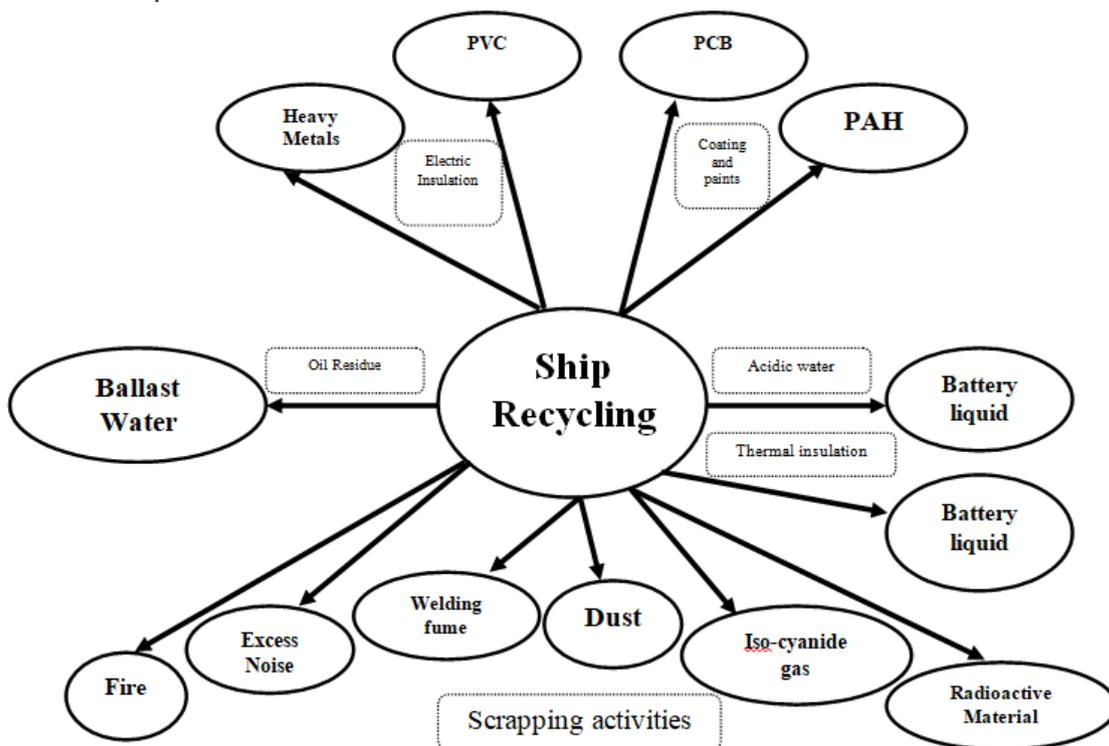


Figure 2: Major pollutants from ship recycling activities. Source: Local Environmental Consultants 2016.

### 1.2.3 Hazard Analysis

Muhammad Muhibbullah (2013) categorized hazards (Table 22) and risks of ship breaking activities in Bangladesh as follows;

Table 1: Hazard categories and mechanisms

SL No.	Category of hazards	Mechanisms of hazards
01	Serious accident related hazards	<ul style="list-style-type: none"> <li>• Fire and explosion by explosives flammable materials</li> <li>• Being stuck by falling materials</li> <li>• Compressed between heavy materials</li> <li>• Snapping of cables, ropes, chains, slings</li> <li>• Handling heavy objects; poor access to progressively dismantled vessels (floor, stairs, passage ways)</li> </ul>

SL No.	Category of hazards	Mechanisms of hazards
		<ul style="list-style-type: none"> <li>Falls from height inside ship structures or on the ground</li> <li>Stuck by moving objects</li> <li>Slipping on wet surfaces</li> <li>Sharp materials</li> <li>Oxygen deficiency in confined spaces. Lack of PPE, housekeeping practices, safety signs</li> </ul>
02	Physical hazards	<ul style="list-style-type: none"> <li>Noise pollution</li> <li>Extreme temperatures</li> <li>Vibration</li> <li>Poor illumination</li> </ul>
03	Mechanical hazards	<ul style="list-style-type: none"> <li>Trucks and transport vehicles</li> <li>Scaffolding, fixed and portable ladders</li> <li>Impact by heavy and sharp-edged tools</li> <li>Power-driven hand tools, saws, grinders abrasive cutting wheels</li> <li>Shackles, hooks; chains</li> <li>Cranes, winches, hoisting &amp; hauling equipment;</li> <li>Lack of safety guards in machines</li> <li>Poor maintenance of machinery and equipment.</li> </ul>
04	Biological hazards	<ul style="list-style-type: none"> <li>Toxic marine organisms</li> <li>Risk of communicable diseases transmitted by pests, vermin, rodents, insects and other animals that may infest the ship</li> <li>Bitten by insects, snakes and others</li> <li>Infectious diseases (TB, malaria, dengue fever, hepatitis, respiratory infections etc.)</li> </ul>
05	Economic and physiological hazards	<ul style="list-style-type: none"> <li>Repetitive strain injuries, awkward postures, repetitive and monotonous work, excessive workload</li> <li>Long working hours, shift work, night work, temporary employment</li> <li>Mental stress, strained human relations (aggressive behaviour, alcohol and drug abuse, violence)</li> <li>Poverty, low wages, under age, lack of education and social environment.</li> </ul>

Source: Muhibbullah, 2013

However, likeliness of hazards was studied and the frequency is quite alarming. Saha et al. (2013) designed a detail-oriented hazard identification table (Table 23) as follows;

Table 1: List of hazard identification

SL No.	Activity	Cause	Consequence	Frequency of happening
01	Crushing in metal cutting machinery	Hand in running machine due to inattention, in appropriate protective equipment	Finger or hand injury	1 in 10
02	Crushing in material pulling machinery	Sleepy floor, in appropriate protective equipment	Finger or hand injury	1 in 10
03	Being caught inside broken ship	Missing cover inattention	Significant body injury	1 in 1000

SL No.	Activity	Cause	Consequence	Frequency of happening
04	Fall from above	Inattention	Leg or hand injury	1 in 100
05	Damage from machinery splinter	Rupture during operations	Major wounds	1 in 10
06	Knock from edge, metal part etc.	Inattention	Wounds, cuts	1 in 10
07	Hair or cloths being caught in equipment	Inattention, inappropriate protective Cause	Significant body injury	1 in 1000
08	Bodily damaged from unobserved machinery start-up	Technical failure, Noise, inappropriate protective equipment	Significant body injury	1 in 100
09	Crushing when lifting Material	Sleepy floor, inattention	Finger or hand injury	1 in 10
10	Damage due to roll coming loose	Rupture of spindle, carelessness	Severe injuries, fatalities	1 in 100
11	Damage due to dropping material	Failure of tackle, inappropriate Fastening	Sever injuries, fatalities	1 in 10
12	Fire	Dust oil, smoking, sparks	Loss of machine, destruction of machines, injury to human body	1 in 10

Source: Ripon Kumar Saha et al., 2013

#### 1.2.4 Human rights issues

There is no doubt that ship breaking industries are necessary for Bangladesh. But, it is also of the utmost necessity to ensure that for the sector to maintain at least a minimal standard for health, safety and environment. Likewise, human rights should be properly upheld. Currently, workers in the process do not use proper personal protective equipment (PPE). Hossain KA (2015) found that the workers do not receive sufficient information regarding hazards and risks to health and safety; they do not even receive training on the issues associated with work in the industry. Muhibbullah (2013) studied the problems and limitations (Table 24) associated with human rights and found the workers operate the loading activities manually leaving them vulnerable to accidents such as gas explosion, toxic gases, iron plates and sheets fall down etc. The study also observed the workers' perception of the tasks they perform. These are detailed in the table below.

Table 2: Major problems and limitations of the ship breaking workers

SL No	Types of problems	Frequency (f)*	Percentage (%)
01	Very hard work and risky job	240	16.33
02	Low wage/ salary	220	14.97

SL No	Types of problems	Frequency (f)*	Percentage (%)
03	Absence of security on life	142	9.66
04	Lack of pure drinking water	88	5.99
05	Absence of hospital near ship yards	120	8.16
06	Lack of sanitation systems	102	6.94
07	Health problems and skin diseases	222	15.10
08	Absence of related training system	90	6.12
09	No job security	132	8.98
10	Lack of recreation facilities	66	4.49
11	Lack of health education and family planning concepts	48	3.27
12	Absence of life insurance	130	8.84
Total		1470	100.00

Source: Muhibbullah, 2013

These issues are compound by the availability of child laborers, a lack active trade unions, lack of proper compensation for injury and death just to name a few. Over the last twenty years more than 400 workers have been killed and 6000 seriously injured according to the Bangladeshi media. Mizanur et al. (2018) interviewed a local NGO who directly works with ship breaking sector and the reply regarding human rights in ship breaking industries was “*The ways the workers are treated in the yard are not humane. They [the yard owners] do not consider them as human. They are abusing these people as they do not get work. Does that mean that we will allow them to die? How can a man remain indifferent to the high number of casualties? It is their mentality that is rotten. They [yard owners] are no longer human; they hunger after money. They profit from the savings that they have to spend for workers training, medical treatment and others. Day by day the accidents are increasing and so are the deaths. We have our documents, please take them; we have documented all workers who died of accidents. Of course the available information we have, we do not have the lists of all casualties, and the actual number is even higher.*”

### 1.3 INTERNATIONAL AND NATIONAL LAWS AND GUIDELINES

Some of the regulatory developments have been able to increase responsiveness to the overwhelming outcomes from harmful waste export and increase few important principles associated with the threats to the sustainability of the fragile global system (Ruchi 2004). Shawkat et al. (2014) synthesized existing legal regulations regarding ship breaking industry in Bangladesh along with some challenges. According to the study, some of the international and domestic frameworks are mentioned here.

### **1.3.1 International Maritime Organisation (IMO) Guidelines**

The IMO keeps overall accountabilities in coordination of ship-recycling issues and monitoring during ship designing, building and operation. In 2003, IMO guidelines were adopted in this industry to ensure safe ship recycling and minimising hazardous materials uses in shipping operation. The guideline also addresses environmental safety, risks, and health and welfare concerns.

### **1.3.2 International Labour Organization (ILO) Guidelines**

ILO conventions deal with working conditions and worker rights. Sawyer (2002) stated that ship breaking countries are under obligation to guarantee standards for workers in yard such as right to form trade unions, standard health issues etc.

### **1.3.3 MARPOL (Marine pollution) Convention 1973/78**

This convention deals with appropriate waste-reception facilities. Shawkat et al. (2014) found that Bangladesh has not ratified the relevant annexes of the MARPOL convention.

### **1.3.4 EU Waste Shipment Regulation**

Because of being a major exporter of end-of-life ships to substandard “dismantling and recycling” facilities in South Asia, EU legislation concerning this regulation is of paramount importance. This regulation is mainly based on Basel convention.

### **1.3.5 International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (Hong Kong Convention)**

According to World Bank (2010), the Hong Kong Convention has been adopted under the auspices of the IMO in 2009 having five year negotiations and is expected to enter into force in 2015.

### **1.3.6 Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal 1989**

This convention stays the principal international legal instrument of regulation of ship breaking industry. Choksi (2001) stated that the main purpose of the convention is to ensure that parties take responsibility for their own hazardous waste, establish their territory, minimise the generation and transboundary movement of hazardous waste, and ensure that they do not export the hazards and damage to human health and the environment, to other countries. Another obligation of this convention is to ensure environmentally sound management.

### **1.3.7 The European List of ship recycling facilities**

From 31 December 2018, large commercial seagoing vessels flying the flag of an EU Member State may be recycled only in safe and sound ship recycling facilities included in the European List of ship recycling facilities. The List was first established on 19 December 2016 and

updated in May 2018. It will be further updated in the future through Implementing Acts to add more compliant facilities or to remove facilities which have ceased to comply. To be included in the European List, any ship recycling facility irrespective of its location has to comply with a number of safety and environmental requirements. In April 2016, the Commission issued technical guidelines on these requirements. The Commission assesses applications received from the ship recycling facilities located in third countries.

### **1.3.8 Inventories of Hazardous Materials**

With the new Regulation, the installation or use of certain hazardous materials on ships will be prohibited or restricted. These hazardous materials include for instance asbestos and ozone-depleting substances. Each new European ship (or a ship flying the flag of a third country calling at an EU port or anchorage) will be required to have on board an inventory of hazardous materials verified by the relevant administration or authority and specifying the location and approximate quantities of those materials. From the publication of the first European List of ship recycling facilities, EU-flagged ships going for dismantling must also have an Inventory of Hazardous Materials onboard. EU Member States' port authorities will be authorised to control European ships to verify whether they have on board a ready-for-recycling certificate or a valid inventory of hazardous materials. In November 2016, EMSA, the European Maritime Safety Agency, published a Best Practice Guidance on the Inventory of Hazardous Materials for practitioners on the field, ship owners and national authorities.

### **1.3.9 Other international Conventions Relevant for Ship Breaking**

Apart from the above mentioned conventions, some of the other international conventions deal with ship breaking industries such as the Law of the Sea Convention 1982, Stockholm Convention, Rotterdam Convention and International Convention on the Control of Harmful Antifouling Systems on Ships 2001 etc.

### **1.3.10 Legal Regulations in Bangladesh**

In Bangladesh, the rules and regulations related to ship breaking industries consider environment and labor relations. Sarraf et al. (2010) stated that the array of government departments involved with ship breaking issues in Bangladesh are Department of Environment (DoE) along with Department of Inspection for Factories and Establishment and the Explosive Department. The acts, Laws and Rules which play vital role in this process are Environment Conservation Act 1995, the Environmental Law 1995 and Marine Fisheries Ordinance 1983 etc. Recently, a draft has been issued named 'Rules on Ship Breaking and Hazardous Waste Management under the Bangladesh Environment Conservation Act 1995; and in 2011 Ministry of Development released 'Ship Breaking and Recycling Rules' which also introduced Ship Building and Ship Recycling Board (SBSRB) to issue certifications mainly. The Department of Environment is supposed to play vital role in controlling environmental pollution from ship breaking activities which is merely succeeded due to lack of manpower and adequate rules. However, a bill titled, 'Bangladesh Ship Recycling Bill, 2018,' was passed in the parliament keeping a provision of tougher punishment for violations of the law, and aiming to give a

further boost to the country's potential ship recycling industry. In the bill it is stated that a zone will be established in Chittagong for the ship-recycling industry under Section 4 of the draft law and the industry owners will have to set up yards and conduct their activities within the zone. The law makes it mandatory to issue life insurance for each and every worker and employee by the owners. The industries will also have to abide by the relevant international laws and conventions. It also said if anyone establishes a yard without permission, the punishment for such offence is maximum two-year jail or minimum BDT 10 lac fine or maximum BDT 30 lac fine or both. The punishment for importing ships without a no-objection certificate (NOC) is two years' jail or a fine of minimum BDT 10 lac fine to maximum BDT 30 lac. If anybody brings a ship ashore and recycles that without NOC certificate, then the punishment is also maximum two years' jail or a fine of minimum BDT 10 lac to maximum BDT 30 lac. The punishment for availing the facility through fake certificate is maximum five years' jail or a fine of minimum BDT 5 lac or maximum BDT 20 lac. In the case of setting up yards outside the zone, the punishment is two years' jail or a fine of minimum BDT 10 lac or maximum BDT 30 lac. Under the new law, a 13-member board will be constituted to oversee the activities of the ship recycling industries with an additional secretary of the Ministry of Industries as its chairman.

## **1.4 ECONOMIC BENEFITS**

### **1.4.1 Growth of the Industry**

Currently, Bangladesh is considered to be one of the most active emerging ship breaking nations. Sujauddin et al. (2017) stated that the total business revenue in fiscal year (FY) 2012 was the highest in Bangladesh (Figure 63); Ship Breaking Industries (SBI) met around 51% of the demand for raw materials and 37% of the demand for finished steel products. Rolling industries output in FY2010 was 1,451,000 t; 23% of the input for this production was from ship breaking sources. SBI was found to be the sole source of scraps for small rerolling industries in Bangladesh, and their output in 2008 more than doubled as compared to 2005. In 2017, Bangladesh scrapped a total of 197 ships and which was 6.5 million GT ([www.shipbreakingplatform.org](http://www.shipbreakingplatform.org)). Larger rolling industries fulfilled their input needs for steel scraps by using both SBI and imported materials. We found a sharp increase in input imports during the global ship breaking recession in 2003–2007 and when Bangladesh's SBI faced a temporary ban in 2010.

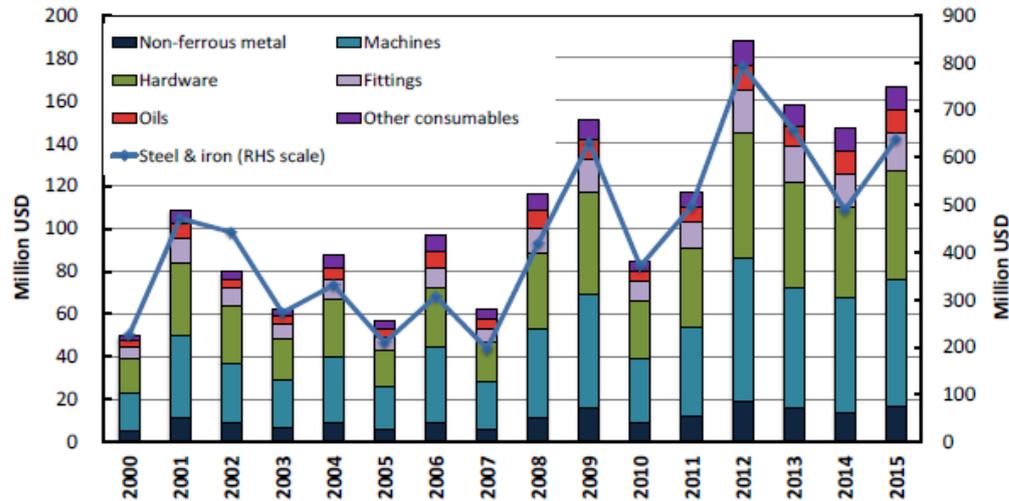


Figure 3: Estimated weight ('000 LDT), average weight (LDT), and number of ship recycled in Bangladesh. Source: Sujauddin et al., Administrative data.

Induction furnaces in Bangladesh in FY2010 produced a total of 787,000 t of billets; more than 40% was from ship-sourced scraps. In 2008, the country's steel consumption was 3,220,000 t, that is, 22 kilograms per person, and the intensity of steel use was 40 grams per U.S. dollar, which was much higher than that of other developing countries with a similar per capita gross domestic product (GDP). The country exhibited a high level of steel consumption relative to its GDP, which is indicative of the contribution of SBI.

#### 1.4.2 Economic Returns From the Industry

Shipbreaking plays an important role in the national economy by different means. Because of having cost-effective human resources, simple importation facilities, enthusiastic entrepreneurs, Bangladesh is having a steady expansion (Figure 64) of this industry and hence the contribution is immense. The scrapping of ships provides the country's main source of steel and in doing so saves substantial amount of money in foreign exchange by reducing the need to import steel materials. Reports say, that at present Bangladesh has a demand for 50,0000 tons of metal / steels, but Bangladesh has no iron ore sources or mines, which make ship scrapping is the inevitable and important source of raw materials. More than 350 re-rolling mills have been using ship scraps as their raw materials. The industry is currently supplying more than 60 per cent of the raw materials for local steel industry. A good number of local industries including heavy and light engineering already been developed depending on ship breaking industry. In some ways it can be considered a "green industry". Almost everything on the ship and the ship itself is recycled, reused and resold. The scrapping of ships supplies raw materials to steel mills, steel plate re-manufacturing, asbestos re-manufacturing as well as providing furniture, paint, electrical equipment and lubricants, oil to the number of businesses that have sprouted up specifically as a result.

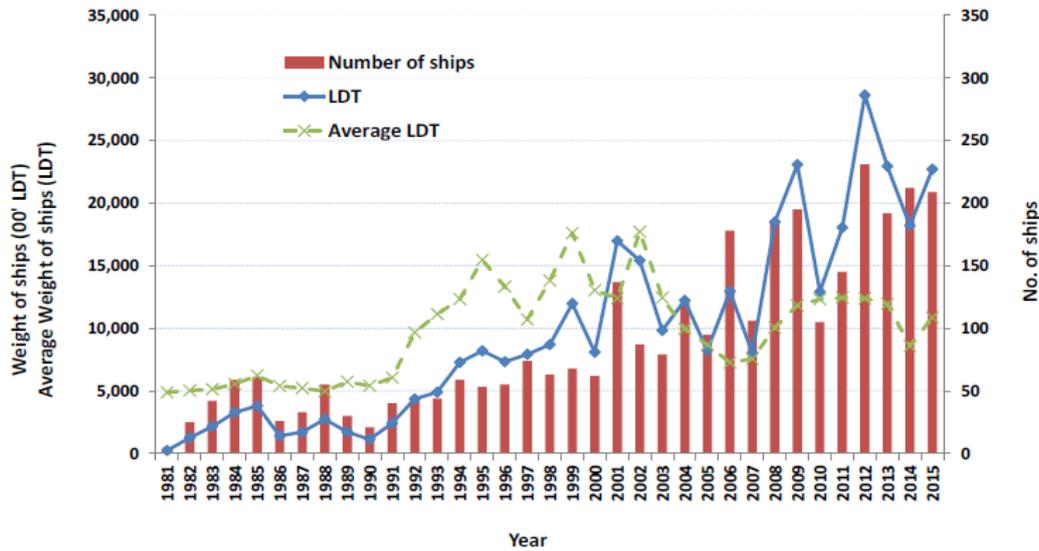


Figure 4: Gross value of production of the Bangladesh Ship Breaking Industry (Source: Ahammad, H., & Sujauddin, M., 2017)

## 1.5 PROSPECTS AND POTENTIALITIES

### 1.5.1 Connecting with Blue Economy concepts

According to World Bank and United Nations Department of Economics and Social Affairs (2017), the “blue economy” concept seeks to promote economic growth, social inclusion, and the preservation or improvement of livelihoods while at the same time ensuring environmental sustainability of the oceans and coastal areas. The blue economy aims to move beyond business as usual and to consider economic development and ocean health as compatible propositions. The activities associated with marine and coastal environment differs from country to country. In Bangladesh, scrapping of old unusable ships is a must for the sea borne trade to continue for the foreseeable period, so also for the continual emancipation for the entire international community. Shipping is the bridge for wider world civilization. Older inefficient ships are detrimental to the sea and to the environment and in conflict with the concept of the Blue Economy. However, the present style and method of scrapping, especially as they are, for example, in Bangladesh, polluting the sea and the environment, and exploiting poor laborers, by most of the ship recycling yards, are severely criticized by all concerned with the sea and the environment. On the other hand, for example, in these countries, especially in Bangladesh the scrapping is proving jobs and steel.

Ship breaking is the prime source of steel and iron materials to the growing industries and infrastructure of the country, which is the 2nd largest breaker, having no iron ore mines and base processing steel mills. This industry not only met the growing needs of furniture, household fittings of all classes, boilers, life-saving boats, generators and so on, but also generated employment opportunities. There are about 125 ship breaking yards with annual turnover of about USD 2.4 billion. Ship recycling must be turned into modern industry with all eco-friendly infrastructures and compliance of international convention. Ship breaking is unavoidable for the international community and essential for a few countries. Therefore, a

method must be adopted which will transform scrapping to a green industry. Implementation of The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships is the answer. The highest benefit from Shipping is derived by developed nations. They have therefore a major role, rather the vital role, to play. To turn scrapping 100% green without exploiting the workers it is indeed necessary to take necessary steps, such as, building up of funds for scrapping from income of the ship over her operational life. When scrapping is green, scrapping is one of the best fitted industries to the Blue Economy.

### **1.5.2 Possible Interventions to Boost Ship Recycling Aspects in Bangladesh in a Sustainable Manner**

The government has also a plan to form a ship recycling board as one stop service for the ship recyclers. The involvement of multi ministries and government department is also a challenge for a sustainable ship recycling. If the government can form a legal body and do all the day to day activities by the consent of the body then it will be better for the business groups and helpful for reporting about any further problems or areas to be improved. As per the government intention, it's working to establish and activate a body to regulate the ship recycling industry of Bangladesh. In Bangladesh, there is a lack of resources, and in some cases goodwill, to control the import of toxic vessels. The Basel Convention (trans boundary movement of hazardous waste), which is supposed to regulate the import of end-of-life-vessels is being completely ignored. The ships on the beach in Chittagong are in large coming from the developed world. Many of the shipping companies are based in Europe. These ship-owners are making huge profits as well by selling their ships to Bangladesh.

The principle of not transferring harm to developing countries is currently not being respected at the international level. Local activists are arguing that the developing countries like Bangladesh and their territories are not dustbins or any dumping place for the developed world. People who live in developing countries have the same right to a decent job; they also need to breathe fresh air and live in a protected environment. International shipping companies especially the European shipping companies have to support Bangladesh for establishing green ship recycling practices in Bangladesh. The country is dealing with all the toxic hazardous materials, on board, but with no financial incentive and technical support for maintaining waste management or waste disposal facilities. The country is seeking for establishing a TSDF (Treatment, Storage and Disposal Facilities) and EU shipping countries should come forward to help the government for the development of TSDF. The country should bring all its resources to ensure ship recyclers are taking effective steps to improve their yard in line with the EU guidelines. There is one yard in Bangladesh named PHP Ship Recycling yard, has achieved Hong Kong Convention certificate and according to the shipping stakeholders, it is a landmark accomplishment for the industry to improve their yards gradually following the examples set by country's leading ship recycling yard. The government is also encouraging other yards to be mobilized by government to ensure a safe and sustainable industrial environment.

### **1.5.3 Institutional Arrangements**

Regarding the operational management, monitoring and overall process of ship breaking industries in Bangladesh, there are concerns from plethora of stakeholders. Among government

organizations mainly Ministry of Industries, Ministry of Labour and Employment, Department of Customs, Bangladesh Navy, Inland Water Transport Authority, Chittagong Port Authority, Radio Communication and Wireless Control Authority, Shipping Masters Office etc. are mentionable. Apart from these importers, the breaking yard owners and Breakers, survey authorities, banks and financial companies, shipping agents, steel re-rolling mill owners and traders also play vital role in the process (Haossain 2006). International concerns like IMO, ILO, UNEP, Greenpeace, NGO Shipbreaking platform, International Federation for Human Rights etc. work as the presser groups to ensure safer and green ship recycling in world-wide especially in the south Asian countries. Among local NGOs mainly Young Power in Social Action (YPSA) and Bangladesh Environmental Lawyers Association (BELA) has been working since the dawn of the ship breaking history in Bangladesh.

## **1.6 CHALLENGES AHEAD & WAY FORWARD**

According to the different experts and experienced national and international organisations the below issues can be prescribed:

### ***1.6.1.1 Disclosure of Information***

The corollary of the shipbreaking industry's lack of official status as 'industry' for a long duration is the lack of disclosure practice regarding the shipyards' activities and annual reports. Inquiring with the Shitakunda, Chittagong's local land office, it was revealed that on an average, out of these 154 yards, 90 yards remain operational in a year. Bangladesh Shipbreakers Association is the official agency responsible to ensure that shipbreaking activity is carried out in an environmentally friendly manner. Hence, the owner's association (Bangladesh Shipbreaking and Ship Recycler's Association-BSBRA) needs to maintain annual report that must disclose the certain information including the number of ships by country of origin, the inventory of the hazardous waste carried in each ship, the total amount of scrapped per yard by year, the deaths in the yards, number of work forces, etc. and other required information which will enable the government body to determine the deviation from the standards. It is imperative that such disclosures be made public in order to preserve the interest of different stakeholders. This demand conforms to the stakeholder theory used in social and environmental accounting research.

The stakeholder theory states that 'the corporation should be managed for the benefit of its stakeholders: its customers, suppliers, owners, employees, and local communities. The rights of these groups must be ensured, and, further, the groups must participate, in some sense, in decisions that substantially affect their welfare (Langtry 1994). Therefore, the community and other stakeholders affected by shipbreaking activity must possess the information in order to participate in the decision making process regarding their welfare. In the age of internet, environmental reporting in the web by the corporations is not uncommon. Indeed, for the activity which has greater degree of impact on environment, the company performing that activity is more obligated to disclose the related information to the stakeholders' concern. This phenomenon of lack of disclosure practice by the shipbreakers is also an indicator of the endemic underestimation of social cost due to the shipbreaking activity in Bangladesh. So, the

disclosure of information is one of the major issues to ensure a sustainable ship recycling in Bangladesh. It should be mentioned here that there is no group who is saying to stop the ship breaking, it's the absence of disclosure is creating a big gap between the owner's and other stakeholders.

#### ***1.6.1.2 Using Contained Areas***

Prompt and sustained action, both in the marketplace and in the courts, is required. The need is especially urgent because the global phase-out of single hulled oil tankers and current backlog of old vessels still in operation mean that the number of retired ships sold for breaking is about to spike. Ships should be dismantled in contained areas where safe use of heavy lifting gear and emergency access for fire-fighting equipment and ambulances can be ensured. A discussion is also there to increase the depth of water in the ship breaking zone. A study for the environmental feasibility should be there before doing it.

#### ***1.6.1.3 Developing Environmentally Sustainable Ship Dismantling***

It is difficult to imagine a better facility where to dismantle a ship than the one or equivalent to the one where the ship was originally built. In these docks ships can be separated from the sea and therefore, controlling the access of the harmful substances to the sea would be more manageable. The dockyards areas are also surfaced with strong and durable coating such as concrete or asphalt so the contamination of soil could be easily controlled as well.

#### ***1.6.1.4 The polluter Pays***

A ship dismantling fund fed by the shipping industry must be created in order to internalize costs currently borne by the environment and the health of impoverished communities in developing countries.

#### ***1.6.1.5 Eco Ship Design and Recycling***

Ship owners should, together with shipbuilders and classification societies, commit to the building of clean ships to avoid future disposal problems and Green Ship Recycling Yards should be identified and rewarded.

#### ***1.6.1.6 Corporate Responsibility***

The shipping industry should take immediate measures such as replacing hazardous materials with clean alternatives during maintenance and survey stops and gas-freeing their ship-for-scrap before export to developing countries to ensure the safe and environmentally sound dismantling of their vessels.

Apart from these specific recommendations there are some other issues should be considered to ensure a sustainable ship recycling industries in Bangladesh.

- The implementation of the national and international convention which is agreed with all parties can be used for a sustainable solution for the green and safer ship recycling in Bangladesh and a comprehensive action plan, engaging government and all other

concerned bodies, is needed to work together towards environment and workers friendly ship recycling in Bangladesh

- Developed countries or exporting countries should take responsibility for pre-cleaning vessels as far as possible before exporting them to developing countries. It should be ensured, before importing, that the ship is pre-cleaned and not containing any hazardous and radioactive materials. It also should be ensured that the hazardous waste will not harmfully effect on environment and human health.
- The ship should be properly decontaminated by the ship owner prior to the breaking. All the wastes (asbestos, PCB, crude oil, toxic sulfur, toxic oil or paints) of the ships should be pre cleaned by an international pre cleaning company before importing the ships. The govt. can provide a list of international pre-cleaned companies. The ships will not get permission to import without prior pre-cleaned certificate from the international pre-cleaning companies.
- Ships are allowed to import for breaking, except war ships, ships used in the Naval, ships operated by atomic power, ships used to carry radioactive materials, the ships containing huge toxic hazardous materials.
- An environmentally sound management of ship dismantling Plan should be provided considering the inventory layout of breaking ships, present status of the ships yards. By this plan it should be ensured the ship will be dismantled in an environmentally sound manner and the environment and human health will not be effected harmfully.
- The national legislation like Marine Pollution Act, Air pollution Act, Bangladesh Environment Protection Act 1995, and Environment Protection laws 1997 etc. should be enforced in case of operating ship yards and waste disposal.
- The policy intends to comply with the existing new legislation in Bangladesh regarding workers' rights like- Labour Law 2006, to protect all the rights (like – Wages, working hour, leave, security, compensation, registration, ID card, job contract, over time etc.) of the ship breaking workers.
- The shipbreaking plan should ensure the occupational safety and health protection for the workers so that the death and injury by accidents; work palace related diseases would be reduced in a minimum level. Personnel Protection Equipment (PPE) like safety belt, helmet, gloves, goggles, mask, coverall, shoes etc. must be provided and also the use of PPE should be ensured by the owners and contractors.
- Awareness of people about the risks, effects and remedies of pollution should be increased so that they can play important role in the abatement of pollution due to Ship-breaking activities. Assessment data should be published in national magazine, newspaper and international journals so that public awareness will be increased.

## **1.7 CONCLUSION**

Ship breaking industry has gained one of the top places in the national economy. The benefits of ship breaking are enormous in sectors like steel company, ship building company etc. Despite having so much benefits, the ship breaking industries have some problems i.e. environment pollution, worker safety. Environment pollution can be kept to minimum by following international regulations for dumping leftover ship materials. Safety issues and health factors of the workers can be ensured by following some strict rules. Safety gears like goggles, helmets, hand gloves, face masks aprons should be provided to minimize the casualties. To hold the position in world ship breaking Bangladesh needs upgrade the infrastructure for waste management, health issues of workers. Ship breaking is global in scope. The Bangladesh ship breaking industry has proven to be internationally competitive and made valuable contributions to the domestic economy.

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