

Ship Recycling and Impact on Environment and Health Safety

Mohammad Abdullah Abu Sayed

Research Scholar, FCT Nova, Industrial Engineering, Lisbon, Portugal.
(Master Mariner)
maasayed74@gmail.com

Alifa Sayed

Student of Bachelor of Entrepreneurial Business Administration (EBA), Entrepreneurship & FinTech.
Wittenborg University of Applied Sciences, Amsterdam, Netherland,
alifa.sayed3740@gmail.com

Abstract

This paper hopes to achieve a better understanding of the subject matter and generate possible solutions based on the multitude of problems presently faced from an economic and ethical standpoint. Because most yard owners do not follow the country's current labor laws, the article will attempt to highlight issues such as the harmful effects of shipbreaking yards on the surrounding environment, environmental pollution due to the discharge of toxic and hazardous wastes, unsafe working conditions for workers, gas explosions and fires causing accidents and death, and so on. The article examines various stakeholders and their roles in maintaining the ecosystem and biodiversity of the marine beach in comparison to other nations in the world where the shipbreaking industry is increasing against the backdrop of frequent shipbreaking yard accidents. Among the parties, the judiciary performed admirably in issuing directions requiring the government and shipbreakers to follow existing norms and regulations.

Keywords: *Ship recycling environment, Health, Shipbreaking.*

1. Introduction

The shipping industry relies on the developing world to dispose of retired deep-sea vessels through the shipbreaking process. As a result, the sector avoids the costs of complying with developed-world hazardous waste management requirements. The dangers of Occupational and Environmental Health (OEH) are high when beached ships are dismantled, particularly in India and Bangladesh. Concerns about these hazards, which first surfaced in the late 1990s, and local agitation appear to be gaining traction for global and domestic OEH reforms. While ships are conceived, built, and operated in a high-tech. Legislatively

controlled environment, their disposal is typically done in a low-cost, low-technology, high-labor-content, high-risk setting with minimal or minimally enforced legislation (**Zakaria, Ali, and Hossain 2012**).

International shipping transports over 90% of global trade and has evolved into a truly global business. Each year, more than 700 oceangoing ships, out of the world's 50,000-plus commerce ships, reach the end of their useful life and are scrapped, primarily by hand, on the beaches of the Indian subcontinent¹. When ships are scrapped, they contain high levels of toxic compounds released into the environment. Scrapping is a time-consuming and manual process that frequently results in injuries and death. When Europe adopted new labor rules and environmental norms, the ship-breaking business relocated to India, Bangladesh, and China.

The relative ranking of dominant violations can change over time but is a labor-intensive, largely unregulated, highly polluted method used to destroy ships. , And widespread cumulative damage to both human health and the environment are numerous and the remains of today's shared factors.

Many of the demolished ships were built before some of the dangerous elements used to make them were banned. The demolition process exposes these dangers and extends them to the tens of thousands of workers involved in the project and the environment in which they live and work. Most people were barely aware of the pollution that had occurred until recently. Before sending the surplus ship to the breaker, the owner did little or nothing to clear up some of the danger in advance. As the law was gradually introduced in one country, the demolition industry simply moved to another. There, regulations became less stringent, and hazardous waste followed the path of least resistance (**Rahman, Handler, and Mayer 2016**).

Labor-related health risks are shifting from developed countries with mature infrastructure, sufficient capital, and legislation to most rural areas in emerging economies where such protection is generally inadequate. Fires and explosions, drop-drops, crushing by falling objects, and other risks and dangers are part of the ship's destruction process.

1.1.Objectives of the study

1.1.1. General objective

The researcher's goal is to better understand, discuss, and investigate the legislative framework around health and safety issues in Bangladesh's ship-breaking business and compare Bangladesh's legal regime to that of other countries.

1.1.2. Specific objectives

- To discuss the current legal situation in Bangladesh's ship-breaking sector regarding health and safety standards.
- Examine the international legal framework governing this industry.
- To compare the legal systems of Bangladesh with other countries.
- Make recommendations when appropriate.

2. Literature Review

Removing an old vessel's structure for scrapping or disposal is known as shipbreaking (also known as ship recycling). It involves a wide range of tasks carried out on a pier, dry dock, or dismantled yard, from removing all of the ships' gear and equipment to chopping down and recycling the ships' infrastructure. Due to the structural complexity of the vessels and the environmental, safety, and health considerations involved, shipbreaking is a difficult procedure.

Most ships have a lifespan of a few decades (an average life span of 28 years) before they become uneconomical to refit and maintain. Container ships, general cargo ships, and cruise liners account for around 45,000 oceangoing vessels worldwide. Roughly 700 are decommissioned and scrapped to recover their steel content every year. Shipbreaking allows for the reuse of ship materials, particularly steel **(Rahman and Mayer 2016)**.

Behind India and China, Bangladesh became the world's third-largest shipbreaker in 2013, demolishing 210 ships (Financial Express 18 January 2014). It was the second-largest shipbreaker in 2012. India topped the list, with China coming in second with the most ships demolished, followed by Bangladesh, Turkey, and Pakistan. Bangladesh's position in the industry has been slipping since 2009, owing to new rules and regulations, environmentalists' activism, and a drop in shipbuilding and construction demand. The number of ships scrapped varies. Bangladesh is now breaking 26% of the world's total scrapped ships, China 33%, India 31%, and Pakistan 4-5%, according to data accessible from the Ministry of Industries (Financial Express 2 November 2012).

More than 700 ships are abandoned each year, primarily in five countries: China, India, Bangladesh, Pakistan, and Vietnam, some of which are in Turkey, according to Greenpeace sources. The world's fleet has overgrown from 15,000 in the 1960s to 62,000 in 2000, and ships built before 1979 are being accused of

being scrapped as they are phased out due to retirement. The number is expected to increase in the future. Bangladesh needs to take immediate steps to prevent further employment risks in this industry.

The most significant shipbreaking industry is located in Asia's developing countries. The following are the locations of the major shipbreaking industries:

India: Alan is the last resting place of the ship. It is a primary ship-breaking industry. Known as a shipyard, it is the place where unskilled workers tear old ships and sell metal as scrap. These often deadly and dangerous ship-breaking yards, which run seven miles along the coast of Gujarat, India, have become a bit of a boom in recent years. It is located near the coastal area of Alan in Vabnagar, Gujarat, about 3000 km from Chittagong, Bangladesh. In 1983, the ship breaking ground began dismantling ships. Apart from Alan, demolition facilities are also located in the Indian ports of Gujarat and Bab Nagar in Mumbai.

China: Shipbreaking on Chinese beaches appears less spectacular than on Indian or Bangladeshi shores. More cranes and gear are used to break apart ships on docks. However, shipbreaking yards around Asia have similar working conditions. Panyu City, Guangdong Province, southern China, is home to the most extensive scrap yards. China had scrapped half of its oceangoing ships by 1993. Due to official worries over environmental damage, China's shipbreaking efforts have slowed in recent years. China is thought to have at least another 10 million dwt (million dry weight tones) of capacity idle right now, almost as much as India now has.

Pakistan: Oil tankers make up the majority of ships wrecked on Pakistani beaches. Large tonnage vessels are the specialty of Pakistani breakers. The country was the third-largest shipbreaking nation in 1999, but the industry has declined in recent years. The Gadani ship-breaking yard is a hub for scrapping abandoned oceangoing vessels. The yard is near Gadani, a tiny coastal city in the Lasbela District of Baluchistan, Pakistan, on the Arabian Sea. With almost 30,000 direct employees in the 1980s, the Gadani yard was touted as the world's most oversized ship-breaking yard.

Turkey: Turkey's shipbreaking business is located in Aliaga, some 50 kilometers north of Izmir on the Aegean coast. Moreover, despite being an OECD member, Turkey's environmental and labor circumstances are pretty similar to those of Asian shipbreaking countries. Shipbreaking in Aliaga began in the mid-1970s and became official in 1984 when liberalization measures authorized the import of ship-for-scrap. According to a Greenpeace examination of shipyards near Izmir, shipbreaking methods in Turkey are equivalent to those in China, India, and Bangladesh.

USA: There are still a few companies doing business in the United States. Most of the ship-breaking work in the United States is done in Fort Eustis, Virginia. Regulations on treating and disposing of harmful pollutants on older ships, such as residual hydrocarbons, lead paints, asbestos, and PCBs, are different from the new eastern part. The industry benefits from the fact that federal policy broadly prohibits the disposal of government vessels from other countries. The domestic ship-breaking industry is expected to continue, with hundreds of such vessels floating worldwide (**Rahman, Akter, and Shemon 2019**).

3. Government Agencies

Several government entities are involved in shipping, including the Department of Shipping and the Department of Marine Mercantile, both of which are under the Ministry of Shipping.

This industry The Department of Shipping issues beaching permits. The Department of Inspection of Factories and Establishments (DIFE) and the Department of Labour (DOL), both under the Ministry of Labour and Employment, are directly involved in looking after the welfare of workers in shipbreaking yards. Other agencies include the Ministry of Environment and Forests' Department of Industries; the Ministry of Energy and Mineral Resources Department of Explosives; the Chittagong District Administration; Customs authority; Chittagong port authority; Bangladesh Inland Water Transport Authority; banks and other lending agencies; insurance companies; shipping agents; surveyor companies; steel and re-rolling mill owners; traders; and local governments.

Since 2006, the Department of Shipping has been active in shipbreaking by allowing a ship to be beached. Before establishing Letters of Credit, it issues a NOC to potential importers (LCs). The Department is currently working on Shipbreaking Guidelines for Bangladesh. The same Ministry's Mercantile Marine Department performs surveys to evaluate the safety measures implemented, inspects the marine stores, creates inventory lists, and examines all of the vessel's paperwork. The Ministry of Industries' Department of Industries has also played an essential role in this industry. (**Hossain 2015**)

The Department of Labor (DOL) is responsible for worker welfare, trade union rights, and industrial relations, among other things. It plays a responsibility in enforcing the Labour Act of 2006. The Department of Labor is expected to promote healthy trade union activities by forming Collective Bargaining Agents (CBA), holding periodic elections, and fostering a positive employer-employee relationship(**Maruf Hossain Mohammad Mahmudul Islam n.d.**).

4. Bangladesh Ship Breakers' Association (BSBA)

The BSBA is the only association in Bangladesh that represents shipbreaking yard owners. This organization has 130 members and a 12-member Executive Committee. They do not all have their yards. When necessary, they rent a yard. In Chittagong, there are now 152 shipbreaking yards, 30 of which are operational. The BSBA expressed its displeasure with the High Court judgment of 17 March 2009 requiring exporters to get a pre-cleaned certificate before ships reach Bangladeshi territorial waters, claiming that such a requirement will discourage entrepreneurs in the foreign currency saving industry. The BSBA is reportedly working out the laws and putting certain safeguards for the workers. Due to the approval of the Hong Kong Convention 2009 and subsequent ratification by the government, all shipbreakers must follow the processes outlined in the Convention in order to stay in business.

5. Ship-breaking Practices around the world

5.1. The Beaching Method

Shipbreaking can take many forms. In the dry dock process (also known as "docking" or "dry dock recycling"), the ship is placed in the dock, water is pumped out, and the ship is dismantled in small increments. The "sideways" or "top-down" method of breaking the pier is to tie the ship along the pier and remove the parts from above with a crane. Slipway recycling (also known as "landing") requires sailing vessels to sail toward the shore at low tide. Then use a mobile crane or barge to dismantle the ship from the shore. The vessel "navigates the tidal flats with all steam at high tide at high water levels." The Norwegian Shipowners' Association defines grounding as the dismantling of a ship without using fixed equipment to collect and dispose of dangerous and contaminated waste. Slipways and beaches are considered more dangerous than dry dock and pier damage. The location is shielded, so the risk of leaks and contamination is negligible. Due to the relatively permanent structure that makes up the dry dock and pier, this technique is also easy to control.

5.2. Risks Related to Environmental Damage, Health, Safety, and Labor Rights

Pollutants can be contained, and environmental damage avoided in protected recycling centers. On average, 95 percent of a ship's steel is painted with 10-100 tonnes of lead, mercury, zinc, arsenic, chromium, and other heavy metals. When the ship is disassembled for scrap, PCBs, asbestos, and a large amount of oil pollute the environment. Tidal water can wash contaminants away from shipbreaking on the beach in the intertidal zone. 12 Shipbreaking activities, when combined with the release of poisonous gases into the

atmosphere and the improper storage of hazardous goods, are likely to impact the local ecology. Communities that rely on agriculture and fisheries are also affected by coastal soil, air, sea, and groundwater pollution. According to the International Labor Organization (ILO), ship breaking is "one of the most dangerous occupations," There is a significant risk of worker death or injury. Ship Health and Safety Guidelines: According to Asian and Turkish guidelines, dangerous goods and waste and physical, mechanical, biological, ergonomic, and psychological hazards are the most common accidents leading to injury or death. It is one of the causes. Recent reports confirm that severe and fatal wreckage still occurs. Accidents and illnesses caused by long-term exposure to toxic waste cause damage (**Hasan et al., 2013**).

5.3. Bangladesh: The Ship Recycling Industry in Chittagong

Beaching began 40 years ago¹⁵ on the Sitakunda coastal strip northwest of Chittagong, Bangladesh. It is the world's largest shipbreaking plant and Alang in India. The yards in this area employ approximately 40,000 people. Migrant workers from Northwest Bangladesh make up the majority of the workforce. Accidents happen frequently and are extensively recorded. According to one report, 90 workers died between 2005 and 2012, an average of more than one worker each month. According to another estimate, 53 workers were killed, and 78 were injured at the Chittagong shipbreaking yards between 2011 and 2015. Five workers were murdered, and three were injured in 2014 due to poisonous gas inhalation. In addition, three people died due to falling metal plates or wires; three people died as a result of falling. Two people died, and one person was injured in unexplained circumstances. In 2015, 16 workers died, and 22 were injured on the job (**Gunbeyaz, Kurt, and Baumler, 2019**).

5.4. India: The ship Recycling Industry in Alang

Alang (also known as Alang Sociya) 's ship breaking business is the second-largest after Bangladesh's Chittagong. In the villages of Alang and Soshiya in Gujarat, India, Shipbreaking directly employs approximately 35,000 migrant workers and indirectly employs additional people through adjacent industries. Workers come from India, mainly from Orissa, Uttar Pradesh, Bihar, Jharkhand, and West Bengal. Between 1983 and 2013, 6,318 ships were stranded and wrecked in Alan. Shipyards produce 3 million tonnes of scrap metal each year. Some ships are less than 15 years old and carry fewer harmful compounds, making them safer than older ships. Accidents are common in Chittagong as well. Around 470 workers perished in accidents at Alang between 1983 and 2013 (**Alam et al., 2018**).

6. Categories of shipbreaking workers

6.1. Health hazards risks with vulnerability on the health of shipbreaking workers

There are two types of workers associated with shipbreaking activities in the research area: regular and casual workers.

- i. **Regular workers:** Regular employees and workers are classified as permanent employees and are paid a monthly income that includes a housing allowance, medical allowance, and convergence allowance. This category also receives a bonus for working overtime. They are also classified into the following categories:

Supervisors: Foremen are the leaders of the workers' group and also oversee various worker issues. They frequently send workers to the shipyards from various locations.

Filters: They are tasked with dismantling critical components, piping, gear, and metal from the vessels. Gas cutters: These are the most competent and well-paid workers, but they are also vulnerable to frequent explosions. The gas cutters use gas torches to work.

Crane operators: They are in charge of loading and unloading cranes. Truck drivers are responsible for transporting products from one location to another. Rhythmic callers/singers: They sang to synchronize the feet of a group of casual laborers who were transporting heavy steel plates and pipes from one location to another during shipbreaking.

- ii. **Casual workers:** These workers include several forms of laborers who are paid daily and work in shipbreaking yards under the supervision of the contractor. These groups' main qualities and activities are as follows: Before cutting begins, a portion of the group is assigned to work on the board to remove anything that can be removed.

6.2. Factors behind hazards of shipbreaking activities

There are many essential variables of health hazards identified by shipbreaking due to the unsafe 24/7 environment of the research site. In addition, most workers are not used by life safety devices that are believed to be the source of danger. Explosions and pollution from toxic gases are another integral part of health hazards. That is why; dangerous gas explosions cause most failures. Another cause of the accident was discovered from the investigation that a large metal plate from the upper deck collapsed and was crushed by falling steel beams and plates and electric shock when cutting and transferring

broken parts from the ship (Gunbeyaz et al., 2019).

6.3.Risks Related to Environmental Damage, Health, Safety, and LaborRights

Pollutants can be contained, and environmental damage avoided in protected recycling centers. On average, 95 percent of a ship's steel is painted with 10-100 tonnes of lead, mercury, zinc, arsenic, chromium, and other heavy metals. When the ship is disassembled for scrap, PCBs, asbestos, and a large amount of oil pollute the environment. 11 Tidal water can wash contaminants away from shipbreaking on the beach in the intertidal zone. 12 Shipbreaking activities, when combined with the release of poisonous gases into the atmosphere and the improper storage of hazardous goods, are likely to impact the local ecology. Local communities that rely on agriculture and fishing are also affected by contamination of coastal soil, air, sea, and groundwater. 13 Shipbreaking, according to the International Labor Organization (ILO), is "one of the most hazardous vocations," with a significant risk of death and injury for workers. 14 Hazardous substances and wastes and physical, mechanical, biological, ergonomic, and psychological dangers are among the most common causes of accidents that result in injury or death, according to the Safety and Health in Shipbreaking: Guidelines for Asian Countries and Turkey.

7. International Regulation of Shipbreakingandhealthand safety issues

7.1.Basel convention

International rules have usually been carried out to the transport enterprise to shield workers` fitness and protection and the maritime surroundings. The International Convention for the Safety of Life at Sea (SOLAS) is the maximum critical conference for service provider ships' protection. Another set of worldwide accords, wide variety 66, addresses the risk of delivering pollutants. The International Convention for the Prevention of Pollution from Ships (MARPOL) is the maximum critical worldwide treaty aimed at stopping pollutants of the marine surroundings through ships, whether or not because of operational or accidental causes. Sixty-seven The dismantling of end-of-lifestyles ships, in comparison to the strict law with inside the active part of a deliver's lifestyles.

Ships have long been exempt from international regulations, both human health and safety and environmental preservation. With the global shift of the industry from advanced and highly regulated countries to countries with weaker regulatory and enforcement systems, international regulations are required to protect human rights and environmental standards for occupational health and safety. The Basel Convention on the Shipment of Hazardous Waste has been used to address regulatory issues as

there is no international law to address the specific challenges of ship recycling. The Hong Kong Convention on Ship Recycling was adopted by the International Maritime Organization (IMO) in 2009. However, it has yet to enter into force. Regulation has been established at the European level to implement these norms and aid in creating a European framework for ship recycling industry control.

7.2.The Hong Kong Convention

In 2009, the International Maritime Organization (IMO) adopted the Hong Kong Convention on Safe and Environmentally Friendly Ship Recycling. It was developed in collaboration with the International Labor Organization and the Parties to the Basel Convention and opinions from IMO member states and non-governmental organizations. This is the first international agreement to address all aspects of ship recycling, including issues related to working and environmental conditions of ship recycling plants, from shipbuilding to marine operations to shipbreaking. However, he was punished for not taking decisive action against the grounding technique. The Hong Kong Convention sets out regulations on shipowners and ship recycling facilities, and local governments and covers the following topics:

- The safe and environmentally sound design, building, operation, and preparation of ships for recycling
- , the safe and environmentally sound operation of ship recycling facilities
- the construction of a ship recycling enforcement mechanism that includes certification and reporting criteria.

7.3.IMO Guidelines on Ship Recycling

Following the Hong Kong Convention's adoption in 2009, the International Maritime Organization's Marine Environmental Protection Committee (MEPC) developed and adopted a set of guidelines to aid in the early implementation of the Convention's technical requirements, as well as to guide stakeholders such as shipbuilders, ship owners, and ship recycling facilities:

- 2011 Guidelines for the Development of a Hazardous Materials Inventory
- Guidelines for Developing a Ship Recycling Plan in 2011
- 2012 Ship Recycling Guidelines for Safety and Environmental Protection.

7.4.TheEUShipRecyclingRegulation

The European Union has responded to international legal documents by enacting legislation to ensure the consistent application of relevant agreements throughout the EU, in some cases before international entry into force. The enactment of EU Waste Transport Regulation 76 in 2006 raised the Basel

Convention to the European level and amended bans that have not yet been enforced under international law. Vessels that have reached the end of their useful life are classified as hazardous waste and are not permitted to be exported from the European Union to non-OECD countries for recycling.

This rule generally applies the Hong Kong Convention's ship recycling obligations to ships carrying the flag of member states and some restrictions to non-EU flagships calling at EU ports²⁵. It also creates a system in which ship recycling yards wishing to recycle European vessels should document their compliance with applicable regulations and be included in the European list (Gregson et al., 2010).

Hazardous materials must be inventoried onboard all ships, and the use of some hazardous materials will be forbidden on new ships.

- Owners of ships must create a Ship Recycling Plan.
- Only ship recycling facilities on the European List are permitted to recycle ships.
- Ship recycling facilities outside the European Union that wish to recycle European ships must apply to be added to the European List and submit proof of compliance with all applicable requirements.

7.5. Legal regulation of the shipbreaking industry in Bangladesh

Bangladesh's legal framework governing shipbreaking consists of various environmental and labor laws. The Bangladesh Labor Act 2006 now includes shipbreaking in its establishment definition and is a recognized industry in Bangladesh. On the other hand, the ship breaking business is regulated by the patchwork of government agencies such as the Factory / Facility Inspection Bureau, Explosive Pharmacy, and Environment Bureau. Each has a straightforward but essential role to play in shipbreaking. The Bangladesh Environmental Conservation Act of 1995 continues to be Bangladesh's primary environmental law to maintain and improve environmental standards and control pollution.

7.6. Judicial trends in shipbreaking

There are few court decisions in Bangladesh related to the ship dismantling industry. The Bangladesh Environmental Bar Association (BELA) is a pioneer in prosecuting shipyard operators and government agencies. BELA filed a written petition to the High Court in 2003 and required shipbuilders and other government agencies to import the 1995 Environmental Protection Act and the 1997 Regulations and the Explosives Authority's 1989 Basel Convention. Requested to comply with. 31 of ships to scrap. According to the complainant, violations of regulations that result in

pollution of air, water, land, or areas around ship breaking operations are such dangers as the deterioration of marine resources and the constant endangerment. Following the petitioner's hearing, the Bench Division of the High Court Department received an Environmental Impact Statement under Article 12 of the Environmental Protection Act of 1995, which was implemented in detail and rational under the requirements of the 1965 Factory Act. Safety and health practices (Gregson et al., 2010).

8. Material & Method

- **Topographical area:** Chittagong has a long level uniform intertidal zone with a long ocean side furthermore a flowing contrast of 6 meters. This gives extraordinary circumstances for grounding activities.
- **Accessibility of modest work:** The general workforce is paid somewhere in the range of 70 to 80 Taka daily, comparable to 1.0 to 1.16 USD (Hossain et al., 2006).
- **Careless execution of social and natural principles:** There is a low degree of ecological mindfulness and implementation of regulations.
- **The enormous homegrown market for reused steel:** The transport reusing yards give around 80-90% of the nation's steel needs.
- A stable environment and assurance from the Bay of Bengal permit transport reusing exercises to be completed throughout the entire year.
- Great existing framework with adjacent steel factories and streets and rail routes connecting to the capital Dhaka to ship the materials to the Market place.

The ship recycling industry in Bangladesh is vast, employing in every aspect of its operations. Most of the workers in ship recycling yards come from the northern parts of Bangladesh, such as Bogra, Jamalpur, and Sirajganj, where they are extremely poor. A survey conducted by the YPSA in 2020 has sorted out ten districts out of 200 where the bulk of workers come from.

9. Data Analysis

This research study surveyed Hotel Managers from 10 Districts of Bangladesh with a sample size taken as 205 questionnaires distributed to the workers of 10 districts. The information was directly collected from the workers who got the questionnaire filled. The followings are the interpretations based on the findings of the responses.

9.1. Central 10 Districts of Labor

	Percentage of Labour
Bogra	28.63
Jamalpur	18.2
Chittagong	12.6
Sirajganj	10.28
Rangpur	9.23
Thakurgaon	7.25
Mymensingh	5.12
Naogaon	4.33
Chandpur	3.15
Dinajpur	2.66

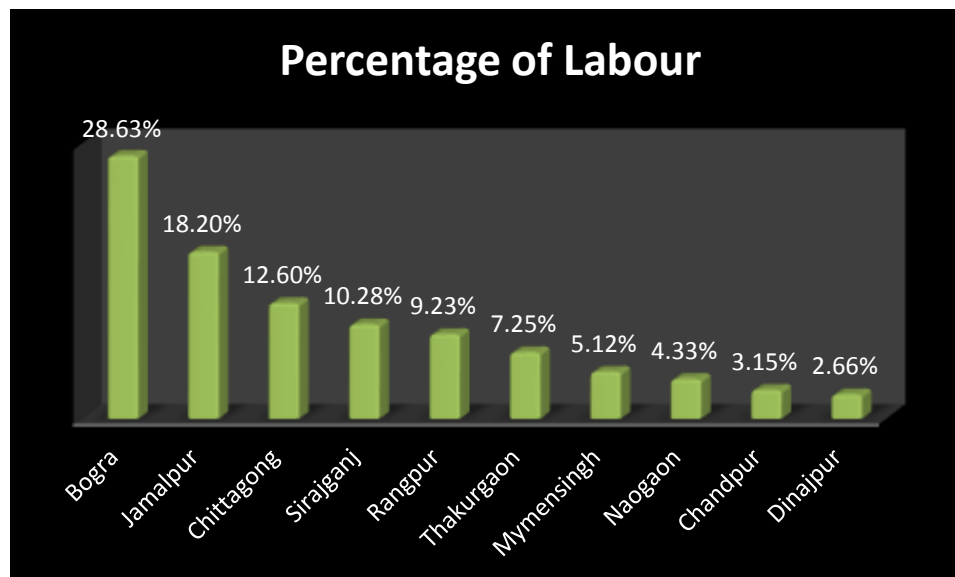
Table:1. Central 10 Districts of Labour**Figure:1.** Central 10 Districts of Labour



Figure: 2. Location Map of Workers' Hometown

These northern country regions are destitution blasted. The vast majority of the laborers from this region have no schooling and are unskilled. Subsequently, there is no potential open door for any professional occupation. They are compelled to work in the boat reusing yards with an absence of work.

None	50.23
Primary	48.2
SSC	5.63
Class 12	3.26
Class 10	1.98
Class 8	0.45
Class 6	0.45
only Name	0.25

Table: 2. Educational Status of Labour

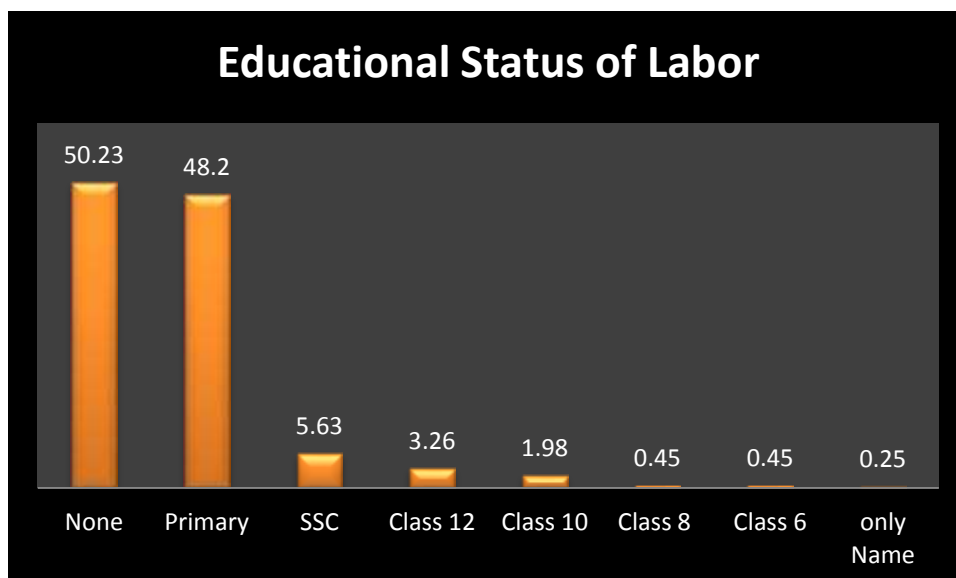


Figure: 3. Educational Status of Labor

The wages for the laborers are subject to the working hours, the expertise level, and the gathering with which the laborer has a place. The forefront laborers on the ground that are the main thrust of the boat reusing industry can be separated into three general classifications, talented, semi-gifted, and incompetent laborers.

1. Talented Workers

- a) **Supervisors:** They are the heads of the work gatherings. Each work gathering will have its foreman, and the supervisors take orders from the project worker. The supervisor's job is significant as he is accountable for employing and terminating. The majority of the laborers the supervisors initiate are from destitution-blasted towns in the north, while the supervisors, for the most part, are from regions around Chittagong. Albeit the supervisors do not partake in work, he deals with the various work issues.
- b) **Fitters:** They regularly work installed and are entrusted with eliminating lines, links, different equipment, and other significant parts. They fundamentally get out the inside of the boat however much as could reasonably be expected prior to cutting starts.
- c) **Cutters:** The cutters furnished with gas lights are partitioned into two gatherings. One gathering works installed the vessel removing segments while the other gathering chips away at the shore to lessen these huge areas into more modest truckable burdens. The cutters are the best paid and the most gifted among the specialists, but they are likewise presented to the most noteworthy gamble of blasts.

- d) **Crane Operators:** The crane administrators are entrusted with stacking and dumping cumbersome things that are difficult to convey by hand
- e) **Truck Drivers:** They are entrusted with transporting materials to and from the yard.
- f) **Singers:** Their job is especially significant in synchronizing the means of laborers conveying weighty steel plates and lines to different regions in the yard. The specialists follow the beat of his singing.

2. Semi-talented and Unskilled Workers

Semi-talented and incompetent specialists fall into the classification of flexible work. They comprise shape rides, loaders, wire pullers, sweepers, etc. They are essentially working in helping jobs to the gathering of gifted specialists or different kinds of difficult work. They are primarily connected through work supply workers for hire and are paid consistently. They work based on the conditions of 'no work, no compensation, and they come under the oversight of their workers for hire.

As far as age, this industry leans toward the work of the younger age as the mass labor force while the senior specialists are kept due to experience as an expert shaper, managers or supervisors. The justification for this is that the business being toiled serious, more seasoned specialists do not have the strength or perseverance to stay aware of each day's work.

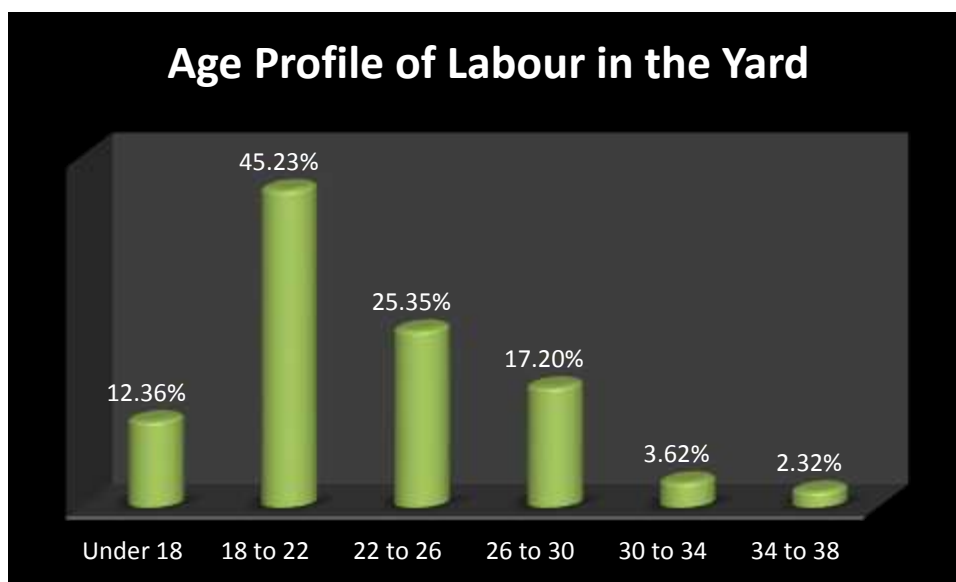


Figure: 4. Age Profile of Labor in the Yard

More alarming is the 12.36% of laborers that fall in the age gathering of people under 18 years old. This infers that the utilization of kid work is happening inside the business. A few reasons expressed by the FIDH include kids being a less expensive workforce, simple to control and most improbable to

guard their privileges, and, surprisingly, more far-fetched to sort out into worker's organizations.

The YPSA has likewise led this review on the specialists' appraisals on their living conditions as far as it is excellent to highly awful. Appropriate clinical offices are absent anyplace close to the yards. The closest clinics should there be a severe crisis are in Chittagong. An accessible clinical consideration is the emergency treatment units recuperated from the boats in the entire office or the close-by drug store (Basha et al., 2007).



Figure:5. Workers' Rating of Living Standards

There are a few issues looked by laborers in the yards; notwithstanding, the YPSA has distributed the topten issues, positioned in the request for 1 to 10 and are as follows:

1. Exceptionally hazardous work/dangers of mishaps/dread to deal with the highest point of boats
2. Compensation is not paid precisely and convenient
3. Absence of drinking water
4. Hands and legs are dependably singed, torment in body
5. A lot of working strain yet lacking wages
6. Vital instruments and gear, PPE does not give
7. Absence of clean latrine
8. No security of life
9. Legs are much of the time cut and harmed
10. Need to work under every single climate component

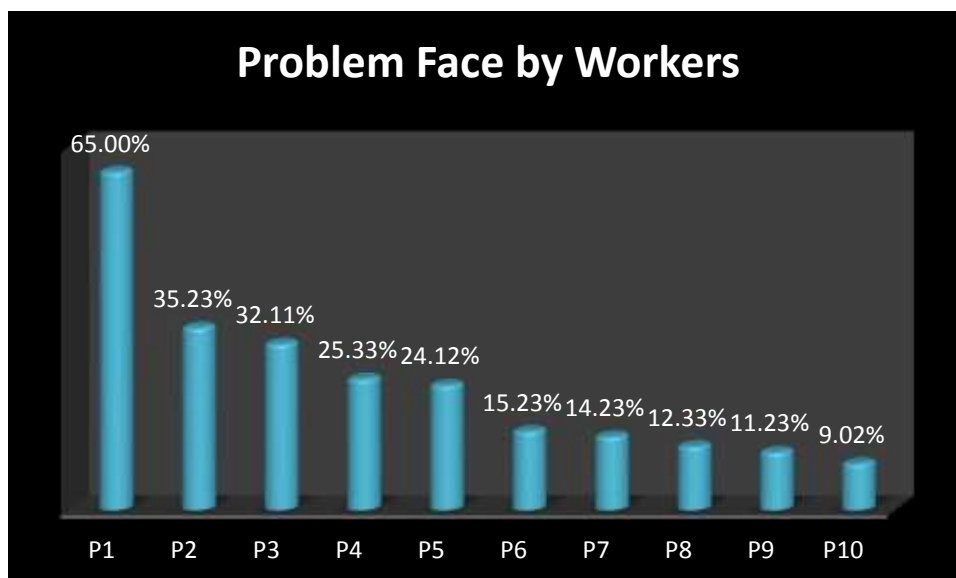


Figure: 6. Major Problem faced by Workers.

Among the issues looked at by the laborers, there are additionally not kidding medical conditions that plague the laborers. This can be credited to the terrible living conditions that make the spread of sicknesses more continuous. A significant number of the specialists likewise experience the ill effects of ongoing lung issues because of the long haul and steady inward breath of harmful vapor and skin illnesses that happen because of delayed contact with oils and synthetics.

10.Result & Discussion

Thinking about the positive effect of transport reusing on the public economy, putting a finish to send reusing is not feasible. To moderate the host of issues related to transport reusing requires the deliberate cooperation and endeavors of researchers, engineers, strategy creators, transport proprietors, yard proprietors, public and global states, NGOs, and the media. A few variables overseeing the arrangements can be applied, and they can be characterized into four classifications: innovative, prudent, regulative, and worldwide mindfulness. The classifications are interconnected; what is more, the reliance on each will assist with advancing a protected and green boat reusing industry. The spotless boat approach is a way of thinking of its own, fully intent on accomplishing ecological execution in all phases of a boat's life expectancy, from development to activity and, lastly, reusing.

11.Conclusion

With much media, consideration zeroed in on the climate. The closeness we are to the truth of totally obliterating our planet encourages the need for changes, and that time is currently. Transport reusing not just contaminates the climate but abuses human privileges moreover. Thus, there may be a demand

for want to hold moving Shipping agencies are required via way of means of globally general norms for moral company behavior to keep away from or remediate terrible influences on human rights and the surroundings. The OECD Guidelines for Multinational Enterprises and the United Nations Guiding Principles for Human Rights each require agencies to behavior due diligence and control dangers to human rights and the surroundings of their operations. Companies are required to endure duty for such dangers at some stage in their cost chain because their commercial enterprise ties both contribute to or are immediately connected to the terrible consequences. When it involves prioritizing the human rights troubles, which can be a threat on the subject of agency operations, the maximum sizeable human rights dangers ought to be addressed and prioritized, irrespective of which they arise within the cost chain. Following the requirements mentioned inside the OECD Guidelines and the UNGP could require transport groups to be accountable for their ships "from the cradle to the grave." The evidence offered on shipbreaking procedures in Bangladesh, India, and Pakistan leaves little doubt that this activity has significant negative consequences for employees' human rights and those living in the towns surrounding the shipbreaking yards.

12. References

1. Alam, Md Wahidul, Xu Xiangmin, Ma Yingjie, and Sara Qayum. 2018. "Suggested Legal Framework for Prevention of Shipbreaking Pollution at Chittagong Coast, Bangladesh with Analysis of Relevant International Issues." *Indian Journal of Geo-Marine Sciences* 47(4):752–58.
2. Basha, Shaik, Premsingh Mansingh Gaur, Ravikumar Bhagwan Thorat, Rohitkumar Harikrishna Trivedi, Sandip Kumar Mukhopadhyay, Nisha Anand, Shalin Hemantbhai Desai, Kalpana Haresh Mody, and Bhavnath Jha. 2007. "Heavy Metal Content of Suspended Particulate Matter at World's Largest Ship-Breaking Yard, Alang-Sosiya, India." *Water, Air, and Soil Pollution* 178(1–4):373–84. DOI: 10.1007/s11270-006-9205-z.
3. Gregson, N., M. Crang, F. Ahamed, N. Akhter, and R. Ferdous. 2010. "Following Things of Rubbish Value: End-of-Life Ships, Chock-Chocky Furniture and the Bangladeshi Middle Class Consumer." *Geoforum* 41(6):846–54. DOI: 10.1016/j.geoforum.2010.05.007.
4. Gunbeyaz, Sefer A., Rafet E. Kurt, and Raphael Baumler. 2019. "A Study on Evaluating the Status of Current Occupational Training in the Ship Recycling Industry in Bangladesh." *WMU Journal of Maritime Affairs* 18(1):41–59. DOI: 10.1007/s13437-019-00164-0.
5. Hasan, Asma Binta, Sohail Kabir, A. H. M. Selim Reza, Mohammad Nazim Zaman, Mohammad Aminul Ahsan, Mohammad Ahedul Akbor, and Mohammad Mamunur Rashid. 2013. "Trace Metals

- Pollution in Seawater and Groundwater in the Ship Breaking Area of Sitakund Upazilla, Chittagong, Bangladesh.” *Marine Pollution Bulletin* 71(1–2):317–24. DOI: 10.1016/j.marpolbul.2013.01.028.
6. Hossain, Khandakar Akhter. 2015. “Overview of Ship Recycling Industry of Bangladesh.” *Journal of Environmental & Analytical Toxicology* 05(05). DOI: 10.4172/2161-0525.1000312.
 7. Maruf Hossain Mohammad Mahmudul Islam, Md M. n.d. *Ship Breaking -Towards Sustainable Management Ship Breaking Activities and Its Impact on the Coastal Zone of Chittagong, Bangladesh: Towards Sustainable Management Young Power in Social Action (YPSA)*.
 8. Rahman, Md. Ashabur, Mansura Akter, and Wahidul Sheikh Shemon. 2019. “A National and International Regulatory Framework for Establishing Sustainable Shipbreaking Industry in Bangladesh.” *SSRN Electronic Journal* 3(1):87–108. DOI: 10.2139/ssrn.3483704.
 9. Rahman, S. M. Mizanu., Robert M. Handler, and Audrey L. Mayer. 2016. “Life Cycle Assessment of Steel in the Ship Recycling Industry in Bangladesh.” *Journal of Cleaner Production* 135:963–71. DOI: 10.1016/j.jclepro.2016.07.014.
 10. Rahman, S. M. Mizanu., and Audrey L. Mayer. 2016. “Policy Compliance Recommendations for International Shipbreaking Treaties for Bangladesh.” *Marine Policy* 73:122–29. DOI: 10.1016/j.marpol.2016.07.012.
 11. Zakaria, N. M. Golam, Mir Tareque Ali, and Kh. Akhter Hossain. 2012. “Underlying Problems of Ship Recycling Industries in Bangladesh and Way Forward.” *Journal of Naval Architecture and Marine Engineering* 9(2):91–102. DOI: 10.3329/name.v9i2.10515.
 12. Asian News International, Ahmed Patel urges Government to Safeguard Human Rights of Workers at Alang Shipbreaking yards (2015) BBC News, Bangladesh" sShipBreakingIndustry Picks up Pace again (BBC News, 2012)
 13. ClassNK, Press release 15 December 2015–ClassNK Issues HongKong Convention Statements of Compliance to two Additional Ship Recycling Facilities in India (ClassNK, 2015)
 14. Føllesdal, & O. Mestad (eds.), *Human Rights, Corporate Complicity and Disinvestment* (Cambridge University Press, 2011)
 15. Frey, F.,, *Breaking Ships in the World- System: an Analysis of two Ship Breaking capitals, Alang, India and Chittagong, Bangladesh*, CSSJ Working Papers 13-01 (2013)

16. Galley, M., Shipbreaking: Hazards and Liabilities (Springer, 2015)
17. International Labour Organization, Ship-Breaking: a Hazardous work (International Labour Organization, Webpage, 2016)
18. Kumar, R., Ship Dismantling: a Status Report on South Asia (NGO Shipbreaking Platform, 2008)
19. Laursen, W. Is there Child Labor in Shipbreaking Yards? (The Maritime Executive, Op-Ed, 2014)
20. Maritime International Secretariat, Guidelines on Transitional Measures for Shipowners: Selling Ships for Recycling (Maritime International Secretariat, 2009)
21. Nøst, T. H. et al., High Concentrations of Organic Contaminants in Air from Ship Breaking Activities in Chittagong,
22. Nystuen, G., "Disinvestment on the basis of corporate contribution to human rights violations: the case of the Norwegian Government Pension Fund", in G. Nystuen, A.
23. Russel, A., Shipbreakers of Bangladesh (Seven Network [Channel 7] Australia, documentary, 2013)
24. Sahu, G. "Workers of Alang-Sosiya: A Survey of Working Conditions in a Ship-Breaking Yard 1983-2013", *Economic & Political Weekly* 49:50 (2014) 52-59
25. Secretariat of the Basel Convention, Technical Guidelines for the Environmentally Sound Management of the Full and Partial Dismantling of Ships (Secretariat of the Basel Convention, 2003)
26. Talukder, M. I. et al., "Environmental Impacts of Ship Breaking and Recycling Industry of Sitakunda, Chittagong, Bangladesh," *Advances in Natural Science* 8:1 (2015) 51-58
27. The Express Tribune, Ship Breaking: Call for Proper Waste Management (The Express Tribune, 2015)
28. U.S. Environmental Protection Agency, A Guide for Ship Scrappers: Tips for Regulatory Compliance (U.S. Environmental Protection Agency, Report No. 315-B-00-001, 2000)
29. Watkinson, R., Case Study to Develop Models of Compliant Ship Recycling Facilities Final Report (RWEC Environmental Consulting, 2012)
30. Wu, W. T. et al., "Cancer Incidence of Taiwanese Shipbreaking Workers who have been Potentially Exposed to Asbestos", *Environmental Research* 132 (2014) 370-378
31. Wu, W. T. et al., "Cancer Incidence of Taiwanese Shipbreaking Workers who have been Potentially Exposed to Asbestos", *Environmental Research* 132 (2014) 370-378