



## **ANALYSIS OF PRESENT GLOBAL SHIP RECYCLING STATUS AND CHALLENGES FOR BANGLADESH**

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### **Abstract**

Ship recycling is the process of stripping down an obsolete ship or its components to be reused and reprocessed. At specialized ship recycling facilities, this activity is carried out to help recover useful materials, where hazardous and other materials must be handled with caution, which includes activities such as storage and handling at the site. Today there are around 20,000 ships over 500 gross tonnages, at the age of 20 years need to be recycled. Ship recycling has been a booming industry for the last two decades for few countries like Bangladesh, China, India, Pakistan, and Turkey; as they recycled 97-98% of global tonnage. Bangladesh accounts for more than 25% of global share. Therefore, governments and international organizations have heightened their regulations and imposed rules for environment friendly recycling. This need is seen as positive, with many environmental advocates arguing for greater control. In 2009, the International Maritime Organization (IMO) created the Hong Kong International Convention (HKC) for the Safe and Environmentally Sound Recycling of Ships in response to rising regulatory scrutiny. This agreement establishes stringent standards meant to ensure safety and environmental protection at shipyards. An essential part of being HKC-compliant recycling Yards must have Ship Recycling Facility Plan (SRFP). The European Union Ship Recycling Regulation (EU SRR) was recently adopted, prohibiting the open beaching method and requiring ships under the EU flag to be recycled at certified European ship recycling yards. This is an analytical study in order to identify deficiencies and make improvements of Bangladeshi recycling yards to continue the business in competitive world.

### **Key Word**

Ship Recycling, SRFP, SOC, HKC, EUSRR, etc.

## Introduction

The international shipping industry transport around 90% of overall global trade. However, outdated and unfit ships for operation are sent for recycling yards. It is interesting to note that the shipping sector has surpassed the automotive and aviation industries in terms of recycling, with up to 98% of ships materials being used again. The hull of any vessel either wooden or steel has been historically valuable. The process of ship breaking or recycling is a method employed to dismantle an old vessel and recycle its useable elements. Ship recycling is the optimum way to discard a vessel, as 90% of the scraped materials can be repurposed and recycled, and this process recognized as an efficient method of saving money and resources. Historical industrial ports in the USA and UK were known for their ship-breaking activities until the late 1900s. Ship-breaking or recycling first moved from Europe and North America to East Asia in the 1980s, and then eventually to South Asia. The Ship-Breaking Regulatory Initiative (SBRI) made the shift to East Asian countries such as Japan, Korea, Taiwan and China because of their access to cheap labor and lack of strict occupational health and safety; environmental regulations. South Asia is currently the epicenter for ship breaking industry including Bangladesh, India and Pakistan being the leading contributors.<sup>1</sup> Surprisingly, ship breaking could have been converted into environmentally friendly industry as nearly every component of the vessel is recycled and reused.

Ship recycling is a process of disposing ships by dismantling them for spare parts or raw materials. It is one of the most lucrative industries today, as leftover parts are sold for reuse and scrap material is extracted to be recycled. Usually, 25 to 30 years of operation of a ship, deterioration and metal fatigue make it unprofitable to use profitably due to corrosion and the scarcity of parts needed for maintenance. Ship recycling is a beneficial process that helps us conserve resources. It repurposes materials from disused ships, particularly steel, and recycles them into new items. This not only reduces the demand for mined iron ore, but also decreases energy consumption in the steel-making process.<sup>2</sup> Reusing fixtures and other shipboard equipment is an environmentally sustainable option. However, this form of ship recycling is a cause for concern due to its intensive labor requirements and the lack of stringent environmental legislation in some parts of the world where it is taking place. This activity is highly hazardous and is considered one of the world's most dangerous industries.<sup>3</sup> Chinese, Greek, and German flag ships are the biggest contributors to the shipping industry, but the disposal of these vessels is much more varied than their origin. Ship recycling yards in India, Bangladesh, China, and Pakistan employ a large number of workers and offer numerous other roles indirectly. In Bangladesh, recycled steel satisfies more than 60% of the country's consumption requirements.

Ship recycling is conducted when a vessel reaches the end of its service life; it will be dismantled and recycled in specialized ship breaking yards. During this process, various activities take place in order to convert the old and obsolete vessel into reusable materials. Ship dismantling and

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<sup>1</sup>Jain, K. P., Pruyne, J. F. J. and Hopman, J. J., "Material Flow Analysis (MFA) as a Tool to Improve Ship Recycling", *Journal of Ocean Engineering*, Vol. 130, pp. 674–683, 2017.

<sup>2</sup>*Life Cycle of a Ship | shippedia*. [www.shippedia.com](http://www.shippedia.com). 21 January 2011. Archived from the original on 24 March 2019, accessed on 2 August 2022.

<sup>3</sup>Lord, Ross; Logan, Nick (12 September 2013). "Ship breaking: Newfoundland's legacy with one of the most hazardous jobs". *globalnews.ca*. Shaw Media Inc, accessed on 4 August 2015.

recycling is a complex process that requires a variety of steps to be carried out safely. This includes removing all equipment and items, cutting down the ship's infrastructure and recycling it, as well as handling & temporarily storing hazardous materials before they are disposed of in a safe dumping plant.<sup>4</sup> Recycling is an integral and reverse engineering process which includes dissecting a vessel into components that are reusable and disposing of the hazardous material to prevent environmental contamination. The saved materials can then be reused or disposed of in the proper manner. Ship recycling usually involves three distinct techniques like beach method, dry dock method and buoy method. Each of these offers a different set of advantages and is preferred for specific applications. The recycling facilities in South Asia primarily use the open beaching method, which unfortunately has some detrimental side-effects to the environment. Materials such as chemicals and pollutants are released into the coastal environment, while plate cutting and burning of wastes also contribute to a harmful level of pollution. Slipway, alongside and dry dock recycling methods are being implemented in China, Turkey and Western countries. Whereas, those countries are recycled a smaller scale as compared to the open beaching method by South Asian countries like Bangladesh, India and Pakistan. Interestingly, open beaching methods alternatives offer an efficient and effective way of recycling products. According to studies open beaching method have more severe environmental and health and safety policies.

In 2009, the International Maritime Organization (IMO) created the Hong Kong International Convention (HKC) for the Safe and Environmentally Sound Recycling of Ships in response to rising regulatory scrutiny. This agreement establishes stringent standards meant to ensure safety and environmental protection at shipyards. An essential part of being HKC-compliant recycling Yards must have Ship Recycling Facility Plan (SRFP). This plan must demonstrate the yard's systems, processes, and facilities that have been put in place to ensure safety and environmental protection. The SRFP outlines should have necessary details of a ship recycling facility, including its layout, water depth, accessibility, maintenance, and dredging requirements. It is an invaluable resource for anyone looking to understand how these facilities work. The growing demand for ship recycling has prompted stricter regulations at local and international level to ensure safety and compliance. In order to ensure safety and protect the environment, the IMO created the HKC for the Safe and Environmentally Sound Recycling of Ships in 2009 due to growing regulatory requirements. This made it necessary for ship recycling yards to operate according to certain standards. One of the mandates of HKC is that an approved ship breaking facility has to create a Ship Recycling Facility Plan (SRFP).

The SRFP provides crucial information regarding a ship recycling facility, including its layout, water depth, accessibility, routine maintenance, dredging, etc. South Asian recycling plants largely employ the open beaching system. While this method has been profitable, it can also release hazardous materials into the coastal region. The European Union Ship Recycling Regulation (EU SRR) was recently adopted, prohibiting the open beaching method and requiring ships under the EU flag to be recycled at certified European ship recycling yards. This regulation has enabled ships to be recycled responsibly as green recycling technique. Competitors from countries like China, Turkey, and India are striving to develop their ship-recycling yards according to global standards. Therefore, steps must be taken to enhance the ship recycling yards

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<sup>4</sup>Sunaryo, S. and Pahalatua, D., "Green Ship Recycle Yard Design", Journal of Naval Architecture and Marine Engineering, Vol. 12, No. 1, pp. 15–20, 2015.

in Bangladesh in order to remain competitive and comply with international regulations to survive in this global business. Thorough investigations of local existing ship-recycling facilities are important, and essential. Therefore, it is imperative to conduct some studies in order to identify deficiencies and make improvements of local recycling yards to continue the business in competitive world.

It is a combination of research and reviewed work to analyze the present global ship recycling scenario to special emphasis of Bangladesh and narrate the challenges for local recycling industry to survive in the competitive market by evaluating on ground data of local ship recycling yards of Bangladesh and available information around the globe; which has collected by authors and from secondary method since last few years. To compile this paper, both primary and secondary data were acquired. Primary data was collected during visits to numerous ship-recycling yards, organizations and agencies related to the industry. Secondary information was sourced from a range of articles, research papers, publications and media channels like print, social and electronic outlets.

### **Historical Background of Global and Local ship Recycling Industry**

The global ship recycling industry annually dismantles around 1000 ocean-going vessels. Those are “container ships, cargo & bulkers, oil & gas tankers (LNG, LPG), passenger ships and other types of ships, in order to recover steel and other valuable metals or recyclable items. However, at present almost all ship recycling activities are concentrated in five countries: the three South Asian countries (India, Bangladesh, and Pakistan), China, and Turkey. Further capacity is available in North America (US, Canada, Mexico) and within the European Union (amongst others Denmark, Belgium and UK)<sup>5</sup>. At present, South Asia is undoubtedly the global center for ship recycling activities. Global major recycling yards are located in India, Bangladesh, Pakistan, China and Turkey.”<sup>6</sup> Around 200 different types of obsolete ships are recycled annually in different yards located at Chattogram in Bangladesh. For easy understanding, “total number of different types/category of ships recycled annually in Bangladesh between the years 2009 to 2015 has been shown in chart 1 below. Again, from on ground statistics of ship recycling yards of Bangladesh, average 2000000 LDT different types of obsolete ships are recycled annually. Reusable material factor and average materials output per year in Bangladesh has been shown in chart 2 below. However, presently the highest increases in shares have observed for Pakistan, by 14.7% and for India by 3.2% (UNCTAD 2021). On the contrary, there were visible reductions in Bangladesh, by 15% and in China by 2%. Market share of China has reduced due to ban on recycling international ships.”<sup>7</sup> Whereas, Bangladesh market share has declined due to local restriction by government regulation.

The ship recycling industry in Bangladesh started its operations in the 1960s, when a Greek ship ‘MD Alpine’ was stranded on the shores of Sitakund, Chittagong after a severe cyclone. “The

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<sup>5</sup>Hossain K. A., 2017a, “Ship recycling practice and annual reusable material output from Bangladesh ship recycling industry,” Journal of fundamentals of renewable energy and application, Vol 7, Issue 5, Sep 2017

<sup>6</sup>Hossain, K. A., 2019b, “Development of an Assessment Model for Ship Recycling Industry in Bangladesh” Proceedings of the 2nd International Conference on Industrial and Mechanical Engineering and Operations Management (IMEOM), Dhaka, Bangladesh, December 12-13, 2019

<sup>7</sup>UNCTAD, 2023, <https://stats.unctad.org/shiprecycling/>, accessed on 03 Jan 2023

ship remained there for a long time before the Chittagong Steel House brought the vessel and scrapped it. During the Liberation War in 1971, a Pakistani ship 'Al Abbas' was damaged by bombing. It was later salvaged and brought to the Fauzdarhat seashore. In 1974, Karnafully Metal Works Ltd bought it as scrap, introducing commercial ship breaking in Bangladesh. The industry flourished during the 1980s.<sup>8</sup>Over the time, Ship recycling industry has made notable contributions to the economy of Bangladesh and is of paramount importance to the macro and micro economies of poverty-stricken Bangladesh. Ship recycling activities present both challenges and opportunities for our coastal zone management. "Meeting the increasing demand for raw materials such as steel needs to be balanced with the negative impact this activity is having on our coastal environment and the conditions of the workers. Environmental policies and laws were not enforced, labor salaries were among the lowest in the world and there were no standards for occupational health and labor safety."<sup>9</sup>"There is about 150 ship breaking yards in Chittagong, among which 50 to 60 yards are active all through the year. At present, the average annual turnover of the ship breaking industry in Bangladesh is about 12,750 crore BDT (in 2022). In addition, the industry is creating a huge employment opportunity in the poverty prone areas of the country."<sup>10</sup>

Ship recycling industry in Chattogram has gone through lean and boom periods, to become the world's largest ship recycling industry. Today "local ship recycling industry (SBRI) spans over 20 km coast of the Bhatiary- Fauzdarhat- Baroiyawlia area."<sup>11</sup>"SBRI consists more than hundred ship recycling yards in register; where few dozen are in regular operation; the industry directly employs over 200,000 laborers and accounts for the supply more than half of all the steel products in Bangladesh."<sup>12</sup> Around one million people are indirectly earning their bread and butter from this industry. The present type of ship recycling in Bangladesh just requires a large winch, crane, bulldozer, blowtorches, PPE, and few small tools. Rest of the operation is just raw human man power. Ship recycling labor is cheaper in Bangladesh than the other parts of the world. However, environmental and labor standards are applied reluctantly in most of the yards. Few old ships are arriving with HazMat (Hazardous Material) on board on the ship recycling facilities on the beaches, where less adequate waste management process is established in most of the yards. However, future ship will be environment friendly, safer and constructed with almost zero HazMat. As per nature of sea coast and abundant cheap labor, ship breaking/recycling has become a lucrative and profitable business with some challenges for the local yard owners, investors and money lenders in Bangladesh.

### **Important Activities in Ship recycling process**

Before sending a vessel off for dismantling and recycling, it is important to complete

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<sup>8</sup>Hossain K A, 2021, Ship recycling Process and Material Distribution Channel Model for Bangladesh Ship-Recycling Industry, Vol 2, Issue 1, BIMRAD Journal, May 2021

<sup>9</sup>YPSA, 2023, Overview of Ship Breaking in Bangladesh, <https://shipbreaking.info/overview-of-ship-breaking>, accessed on Feb15, 2023.

<sup>10</sup> Business Inspection (YPSA, 2023)n, 2022, Ship Breaking and Recycling Industry of Bangladesh, <https://businessinspection.com.bd/ship-breaking-industry-of-bangladesh>, accessed on Feb 21, 2023.

<sup>11</sup>Hossain K. A., 2017a, "Ship recycling practice and annual reusable material output from Bangladesh ship recycling industry," Journal of fundamentals of renewable energy and application, Vol 7, Issue 5, Sep 2017

<sup>12</sup>Hossain K. A., 2017b, "Ship recycling status of Bangladesh and annual reusable material output," Journal of Toxicology, Vol 2, Issue 2, Oct 2017

some engineering and commercial tasks to ensure that the ship's life cycle reaches its final step without any issues. Doing this in advance will help you achieve successful recycling. To recycle an old vessel, a set order of procedures needs to be followed [shown in figure 1], which can be divided into two distinct parts: the first being non-technical, and the second being the dismantling of the ship. At present, there is no global regulation that deals with ship decommissioning. This means it must be done responsibly and in accordance with all applicable local laws. Although classification societies are heavily involved with various aspects of merchant shipping, their role in decommissioning is minimal. Classification societies may not have set rules for downgrading a vessel, but they do have their own internal benchmarks and criteria which they adhere to when demoting ships.

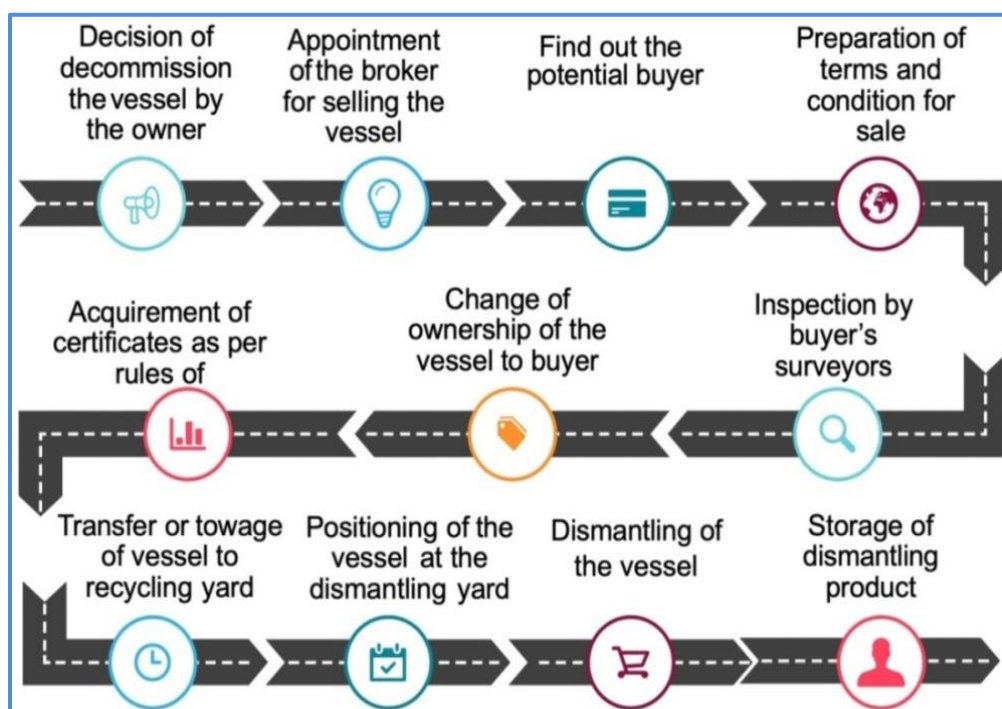


Fig 1: Non-technical and Technical Activities in ship recycling process.

Consequently, it is solely the owner's prerogative to determine whether a vessel should stay in service or be decommissioned. The owner can choose to keep the ship operational for shipping purposes or dispose of it if the scrap value is higher than its current value. The final step in the recycling of ships is dismantling activities (the technical part). This step must be carried out in a shipyard, using the necessary equipment and involving engineering operations before and during, such as blocking, lifting, transporting, and discarding. Large chunks of the ship are cut using saws and torches at the shoreline, allowing them to fall off freely.

The process continues until the pieces can be easily lifted by hand or with a small crane. Manual and mechanical lifting techniques are employed when handling, without any prior weight assessments or examinations. Simultaneously, workers haul the ship inland and use winches in groups to remove its hull steel and other materials. The metal scraps are then sorted according to their material type, e.g. steel, aluminum, copper, etc., with steel usually being re-sold to mills for further processing. Machinery is organized and stored individually in a sheltered area for better

maintenance and protection. Dismantlement process by reverse engineering, efficiency can be significantly improved. This includes dismantling the ship's hull, equipment, and machinery. Unfortunately, it is difficult to achieve the desired result due to infrastructure limitations, layout restrictions, and unscientific approaches used in waste management facilities. The process of scraping the ship is usually carried out as follows:<sup>13</sup>

- At firstly, obsolete ship brought to the shore.
- Then, areas containing hazardous materials are identified and marked.
- Then, remove loose items from ship before actual process of recycling takes place.
- The non-metal parts of the ship are dismantled first and then metal parts are cut off by flame cutting tools. Cutting process is categorized into primary and secondary.
- All hazardous materials are systematically and safely removed from the ship, securely packed in bags, brought down and stored in specifically marked hazardous area and then disposed-off to authorized agencies.
- The steel plates are cut into smaller sizes as would be required for sales.

Fig 2: Technical activities of ship dismantling processes in beach method.



## Commonly used Methods in Ship recycling

According to the latest research, lists of the most common methods used in ship recycling methods are described below:<sup>14</sup>

- a. Beaching Method/ Inter Tidal Landing Method:** In this method, the recycling process is conducted on the beach by pulling the ship towards the beach during high tide while it is floating. The ship is held with the help of winches, and the cutting process is planned and carried out with the guidance and supervision of a naval architect. Additionally, this method requires a medium-sized area in which to carry out the recycling process



Fig 3: A Typical Picture of Beaching Method

- b. Dry Docking Method:** In this method, the dismantling and scraping process is carried out on land, which requires a larger area compared to other methods.



Fig 4: Ship dismantling in dry-docks in Belfast, Northern Ireland.

<sup>14</sup><https://www.wirana.com/index.php>



**c. Slipway and alongside:** A new method that combines elements of both on-water and on-land dismantling has been developed. Initially, the ship's infrastructure is broken down while the vessel is still afloat. Then, it will be transported onto dry land for scraping and further dismantling.



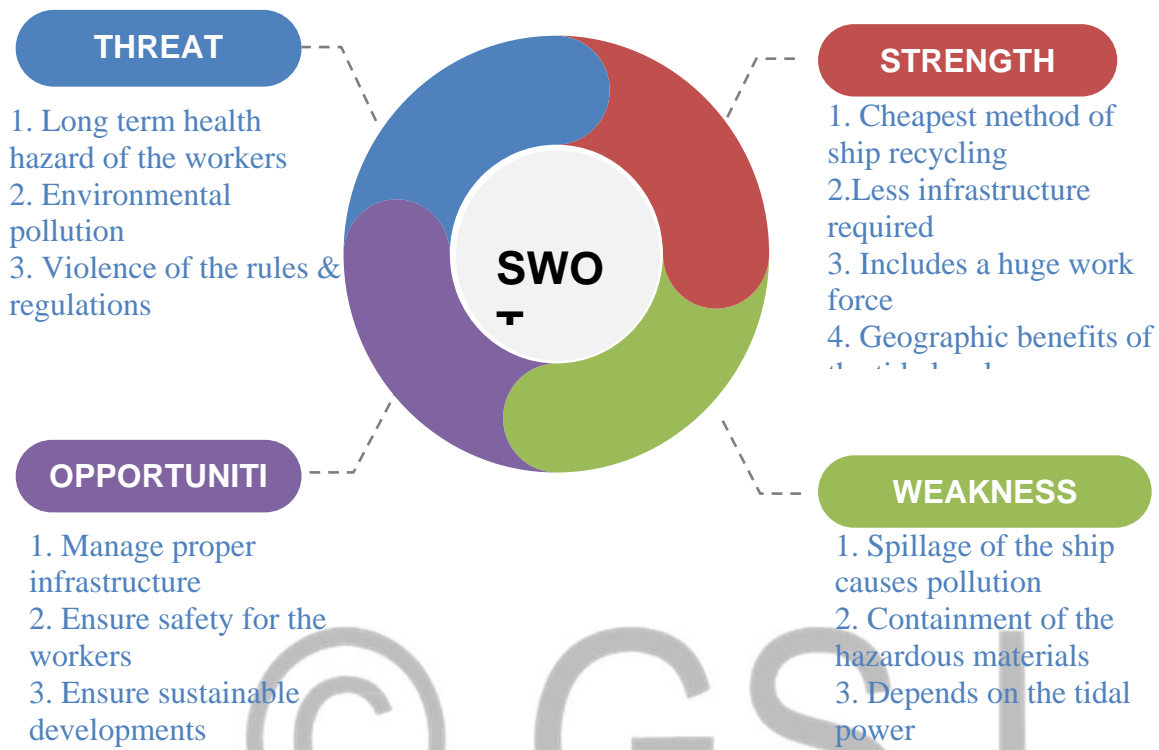
Fig 5: Slipway method



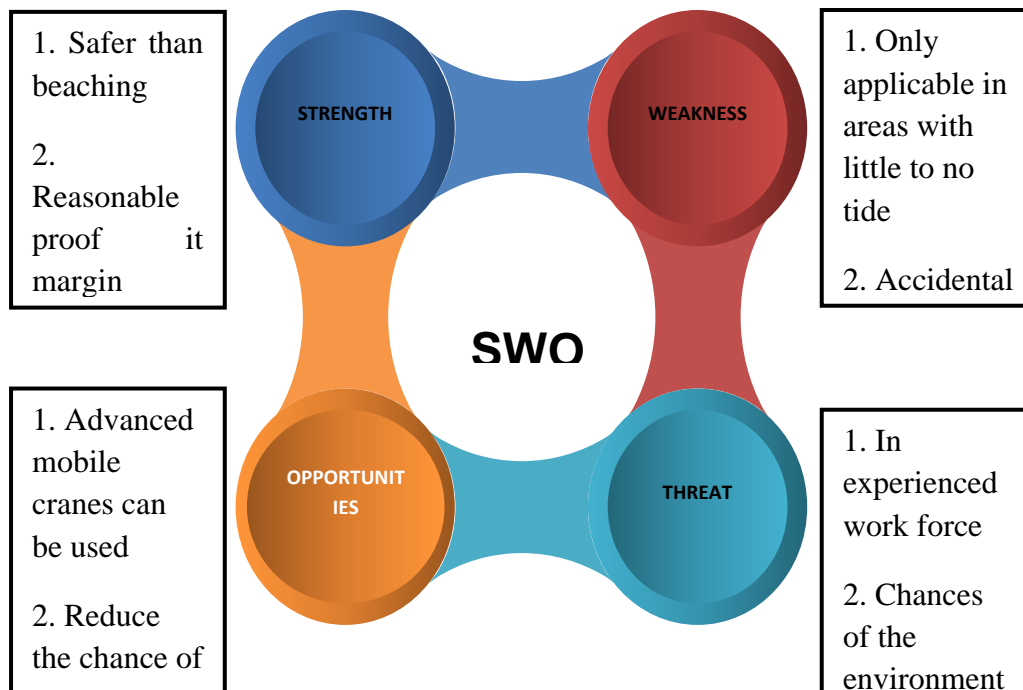
Fig 6: Alongside method

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### SWOT Analysis of Commonly Used Ship Recycling Methods Beaching Method



### Slip Way Method



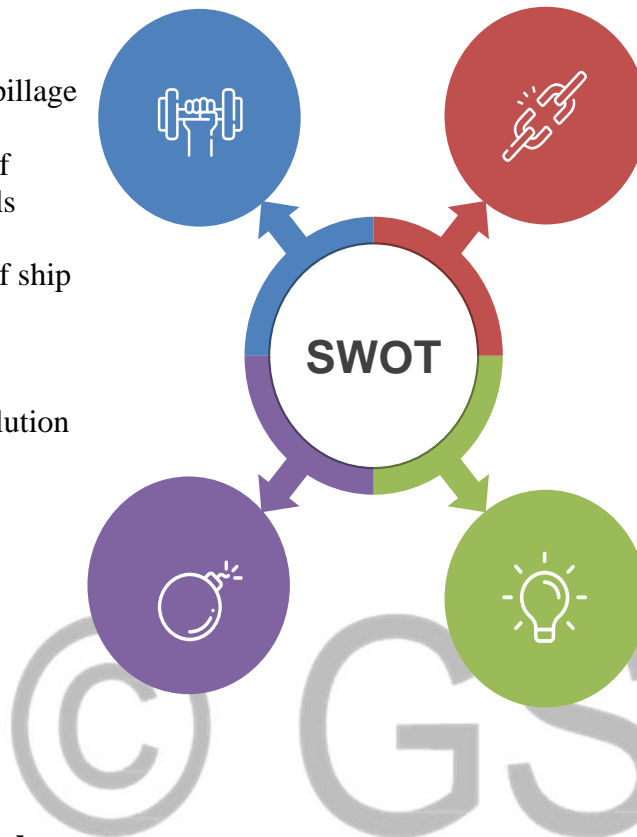
### Dry-Dock Method

#### STRENGTHS

1. No accidental spillage
2. Well handling of hazardous materials
3. Safest method of ship recycling
4. Minimize environmental pollution

#### THREATS

Expensive



#### WEAKNESSES

1. Costly compared with all other methods
2. Maximal infrastructural basis required
3. Not suitable for developing and under developed countries

#### OPPORTUNITIES

1. Making it suitable for developing countries by reducing cost
2. Ensure maximum percentage of scarp from the recycled ship

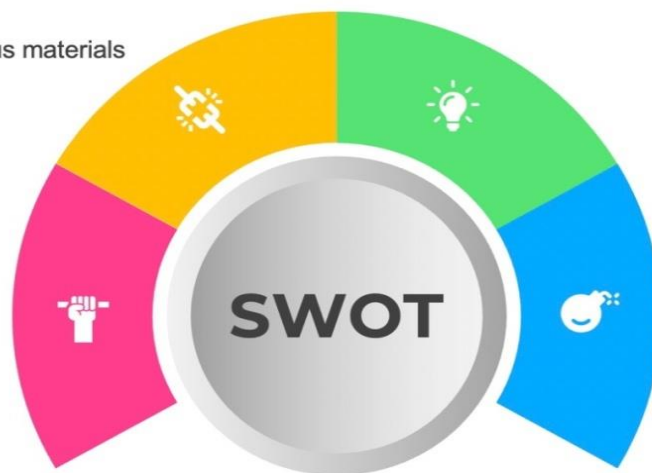
### Alongside Method

#### WEAKNESSES

1. There is a huge impact on the locality around
2. Handling of hazardous materials is not sufficient

#### STRENGTHS

1. The process is systematic thus percentage of scrap maximum
- 2.. Followed by some major ship recycling countries
3. Not depend on tidal effects



#### OPPORTUNITIES

1. Ensure well handling of hazardous materials
2. Suitable agreement for the dispersion of the remains

#### THREATS

1. Long term health issues
2. Environment pollution
3. Abandonment of the practicing wharf or pier

### Statistical Analysis of Ship Dismantled around the World (2012-2022)

In February 2016, the NGO Ship breaking Platform Secretariat in Brussels published a report detailing ship breaking data by country. The statistics show that in one year alone, 768 large ships were destroyed globally, while 469 vessels ran aground on coasts of India, Pakistan & Bangladesh.<sup>15</sup> In February 2017, Brussels hosted the release of the 2016 data on vessel dismantling records by country, organized by a specific organization dedicated to this cause. The data revealed that 862 vessels were demolished in one year, representing 87% of the total vessel tonnage dismantled worldwide. This figure includes 668 vessels removed from tidal beaches, indicating the extent of their destruction. In 2017, the Brussels-based NGO Ship breaking Platform reported that 835 big oceangoing vessels were sent to ship breaking yards, with 543 of them being scrapped in Bangladesh, India, and Pakistan. In 2021, the ship recycling sector in Bangladesh saw a sharp increase, from 144 in 2020 to 254 in 2021, representing a growth of almost 56.69%.

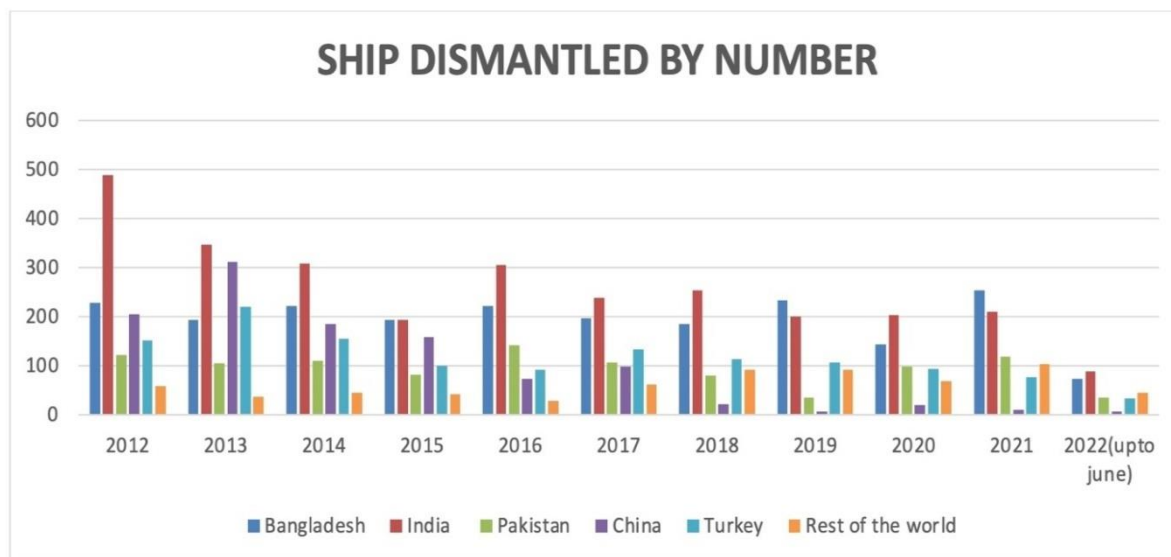


Fig 7: Statistical Analysis of Ship dismantled between years 2012 to 2022.

<sup>15</sup>NGO Shipbreaking Platform.(2016). Annual Report 2016. NGO Platform on Ship breaking (asbl)

SHIP DISMANTLED BY NUMBER											
Country/ Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022 (up to June)
Bangladesh	229	193	222	194	222	197	185	234	144	254	74
India	488	347	309	194	305	239	253	200	203	210	88
Pakistan	121	105	110	81	141	107	80	35	99	119	35
China	205	312	185	158	74	98	22	6	20	10	7
Turkey	151	220	155	100	92	133	113	107	94	77	33
Rest of the world	59	36	45	41	28	61	91	92	69	103	45
Total ship dismantled	1253	1213	1026	768	862	835	744	674	629	773	282

Table1: Number of Ship dismantled between years 2012 to 2022.

Data released by the Secretariat of NGO Ship breaking Platform Shows (figure 8) that in 2012, Bangladesh, India, and Pakistan were responsible for dismantling 18%, 39%, and 10% of the total 1,253 oceangoing vessels that were demolished. According to the organization's 2016 data, 862 vessels were decommissioned that year, with Bangladesh accounting for the highest number of decommissioned boats (26%), followed by India (35%) and Pakistan (16%).<sup>16</sup> According to the Brussels-based NGO Ship breaking Platform, a total of 768 large vessels were dismantled in the previous year, with Bangladesh contributing 35%, India accounting for 30%, and Pakistan making up 5% of the total. This information is depicted in Figure 8. As of 2021, Bangladesh has dismantled 32.86% of the ships dismantled worldwide, and as of June 2022, it was 26.24%, indicating growth from the previous year.

Based on data from the NGO Ship breaking Platform Secretariat in Brussels, certain countries have taken the lead in ship breaking based on the gross tonnage of ships disassembled between 2014 and 2019. In 2014, the total amount of ships demolished globally was 226,898,43 GT (Gross Tonnage), with Bangladesh responsible for 56,158,41 GT of this number; India took 67,154,84 GT and Pakistan accounted for 44,019,77 GT<sup>17</sup>. In 2016, the global gross tonnage of dismantled ships amounted to 27,401,121 GT, with Bangladesh accounting for 9,553,930 GT on its own. The NGO Ship breaking Platform in Brussels has also recently released data indicating that Bangladesh has a significant share of the overall Gross Tonnage of 8,036,554 GT in 2021. (Figure 10).

<sup>16</sup>NGO Shipbreaking Platform (2022). Annual Report 2022. NGO Platform on Ship breaking

<sup>17</sup>NGO Shipbreaking Platform.(2022). Annual Report 2022. NGO Platform on Ship breaking (asbl)

SHIP DISMANTLED BY PERCENTAGE OF NUMBER											
Country/Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022 (June)
Bangladesh	18.28	15.91	21.64	25.26	25.75	23.59	24.87	34.72	22.89	32.86	26.24
India	38.95	28.61	30.12	25.26	35.38	28.62	34.01	29.67	32.27	27.17	31.21
Pakistan	9.66	8.66	10.72	10.55	16.36	12.81	10.75	5.19	15.74	15.39	12.41
China	16.36	25.72	18.03	20.57	8.58	11.74	2.96	0.89	3.18	1.29	2.48
Turkey	12.05	18.14	15.11	13.02	10.67	15.93	15.19	15.88	14.94	9.96	11.70
Rest of the world	4.71	2.97	4.39	5.34	3.25	7.31	12.23	13.65	10.97	13.32	15.96

Table 2: Ship dismantled by percentage of number between years 2012 to 2022.

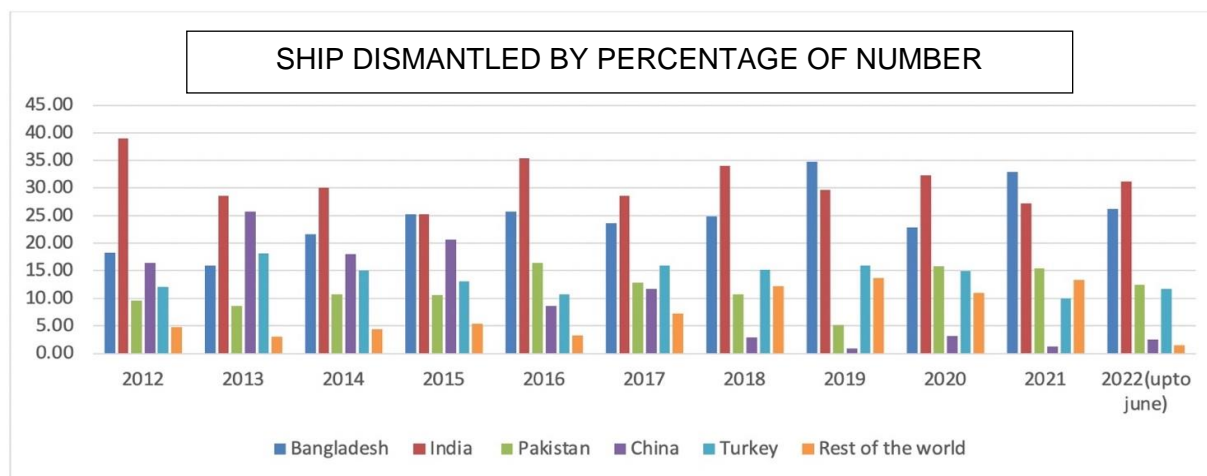


Fig 8: Percentage of Ship dismantled between years 2012 to 2022 around the world.

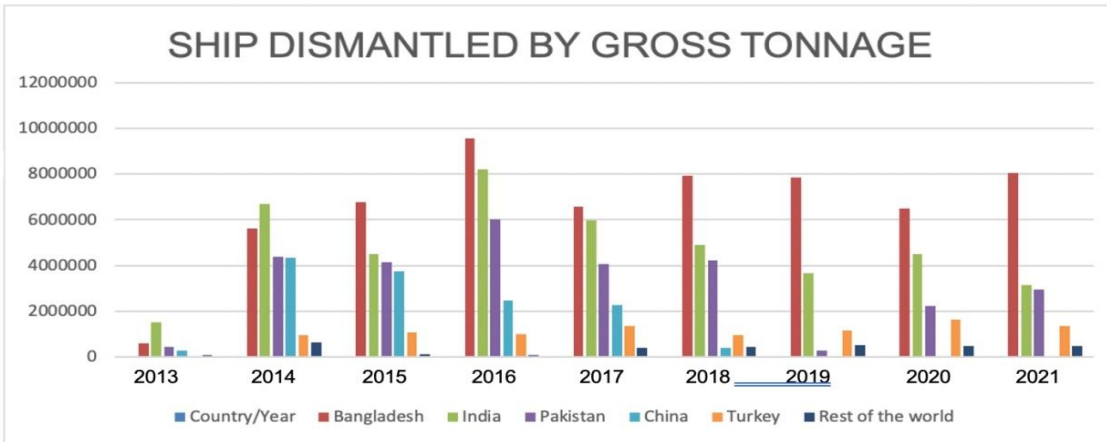


Fig 9: Comparison among major ship recycling nations based on Gross Tonnage.

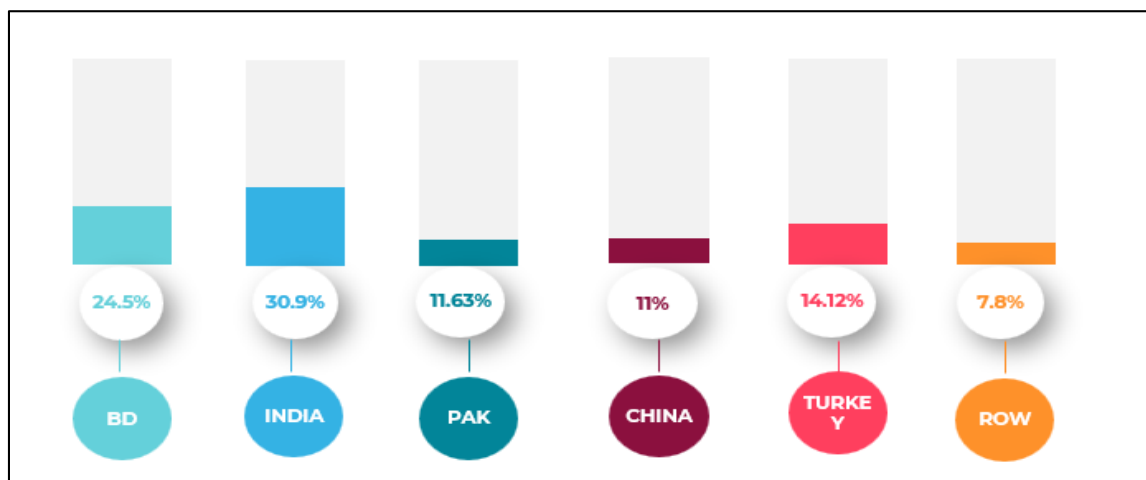


Fig 10: Comparison of Ship dismantled by number from 2012 to 2022(up to JUNE)

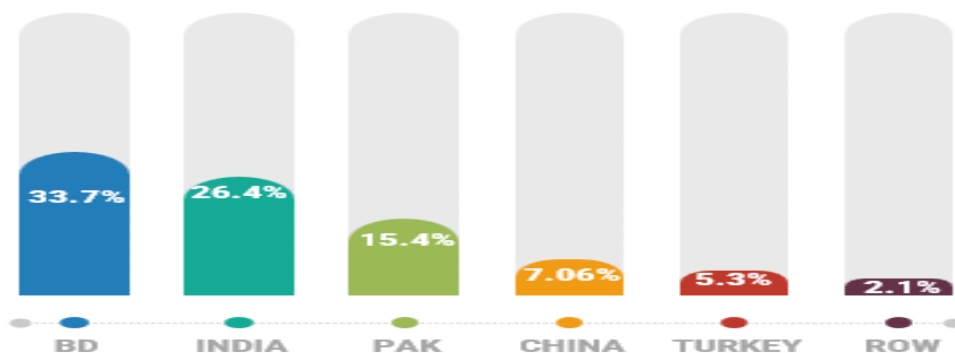


Fig 11: Comparison of Ship dismantled by gross tonnage from 2013 to 2022.

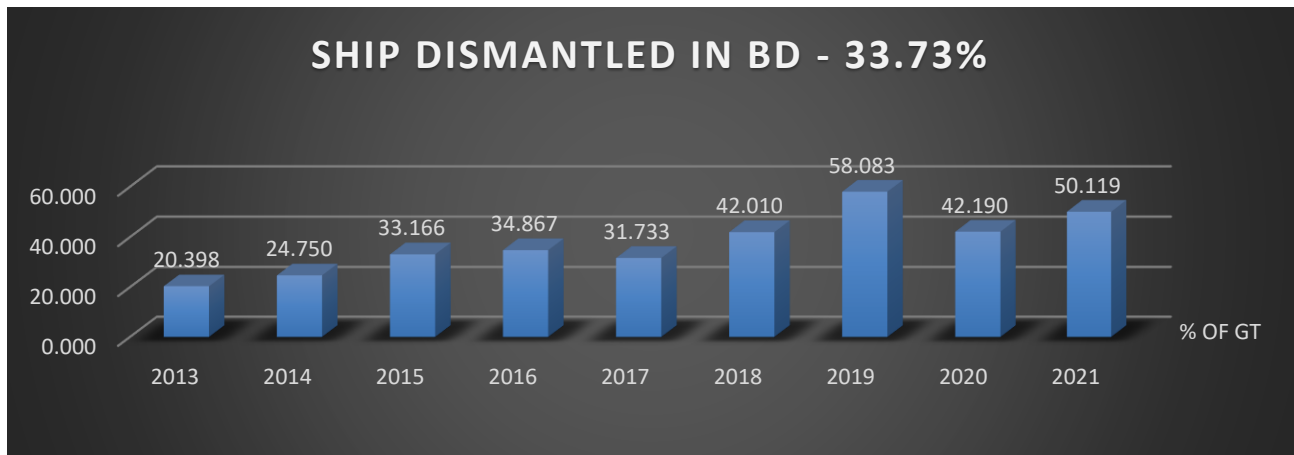


Fig 12: Percentage of Ship dismantled in Bangladesh between years 2013 to 2021.

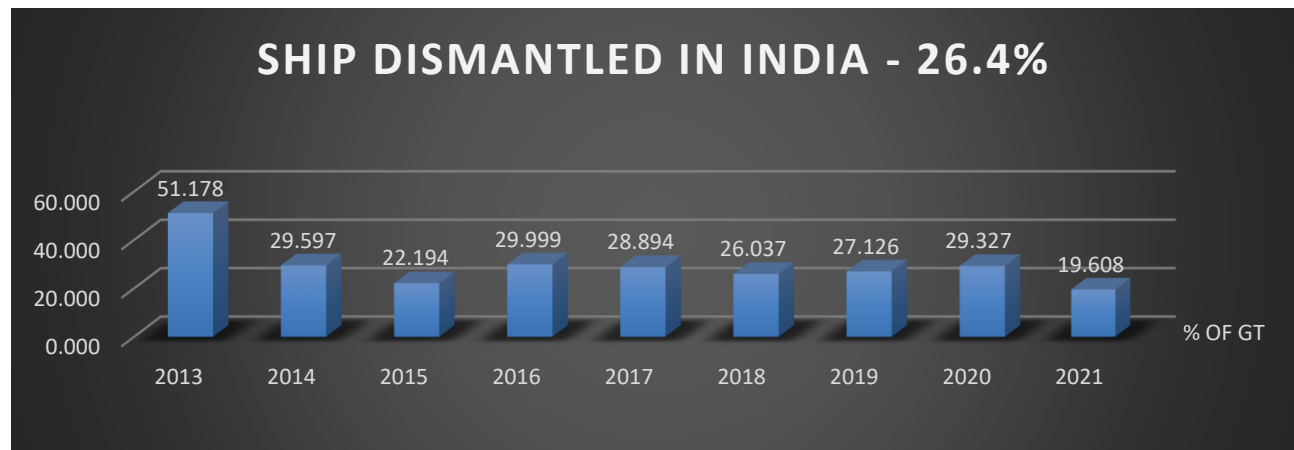


Fig 13: Percentage of Ship dismantled in India between years 2013 to 2021.

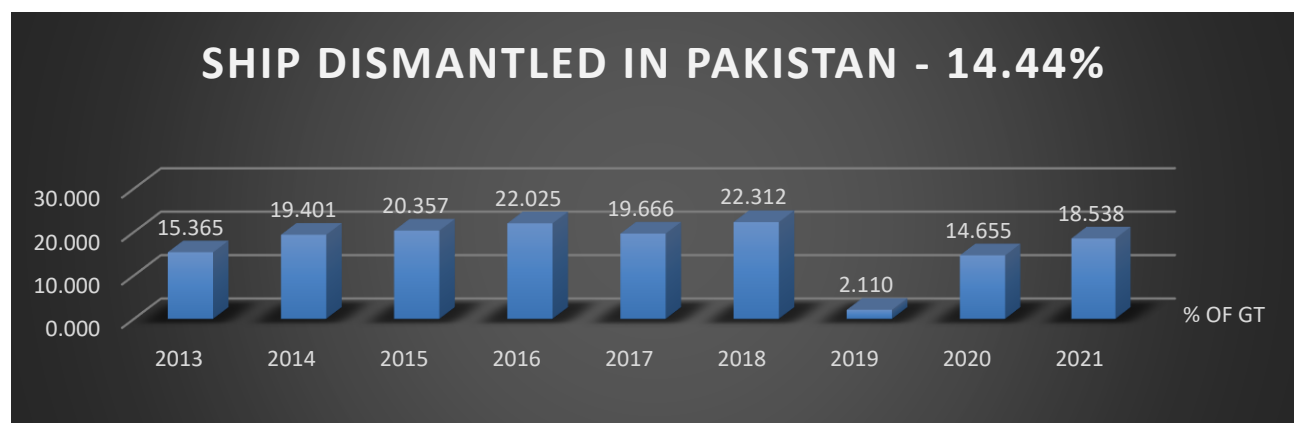


Fig 14: Percentage of Ship dismantled in Pakistan between years 2013 to 2021



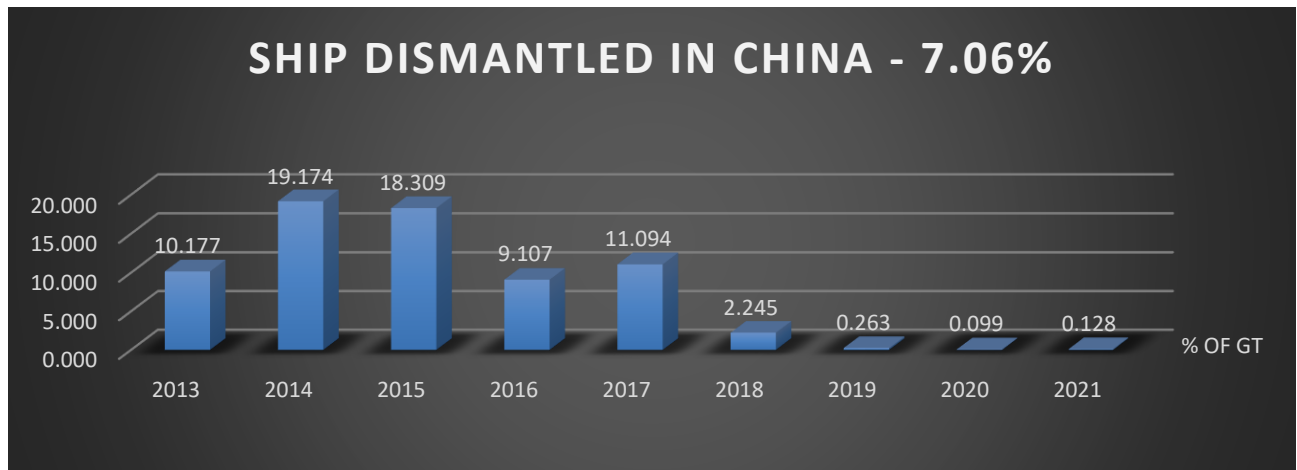


Fig 15: Percentage of Ship dismantled in China between years 2013 to 2021

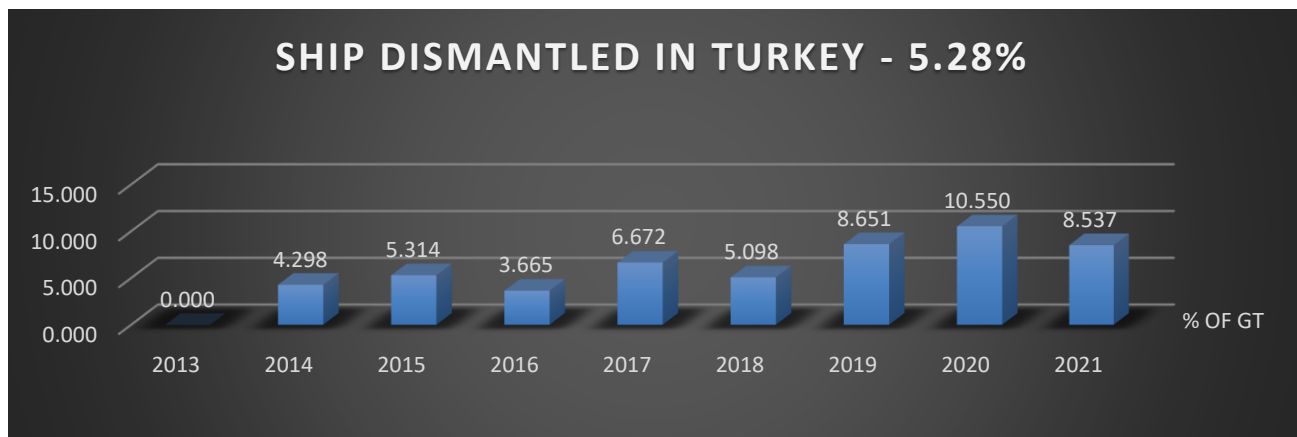


Fig 16: Percentage of Ship dismantled in Turkey between years 2013 to 2021

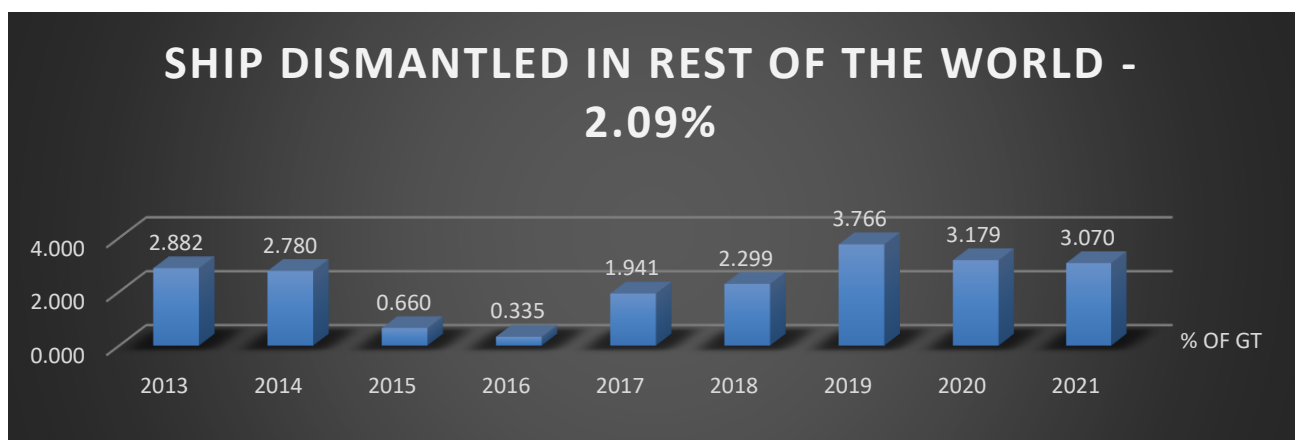


Fig 17: Percentage of Ship dismantled in rest of the world between years 2013 to 2021

## Ship recycling Outlook of Bangladesh

The ship recycling industry has had a major economic impact on Bangladesh for many years and is critical for improving both the macro and micro economies of the country, which is often, plagued by poverty. Ship recycling activities present an interesting predicament for our coastal zone management. We need to find a way to make this practice economically viable while taking into account the associated environmental and labor conditions. Striking a balance between satisfying the need for raw materials, such as steel, and reducing their adverse effects is a necessity. Environmental policies and laws were not enforced, labor salaries were among the lowest in the world, and there were no standards for occupational health and labor safety. Approximately 150 ship breaking yards are located in Chattogram, of which 50 to 60 are active throughout the year. In the current climate, the Bangladeshi ship breaking industry is creating a turnover of 12,750 crore BDT per annum (in 2022). This industry also provides numerous employment opportunities in poverty-prone regions of Bangladesh.<sup>18</sup> Ship breaking in Bangladesh is a labor-intensive process that requires minimal tools and machinery such as winches, cranes, bulldozers, and blowtorches. However, it largely relies on manual effort of human workers to get the job done.

Ship recycling labor costs are much lower in Bangladesh than in other regions; unfortunately, environmental and labor regulations are often not fully enforced in these yards. Old ships carrying hazardous material are approaching the beaches, where improper waste management systems have been implemented in the majority of yards. This is a concerning situation that needs to be addressed promptly. Going forward, fleet operations will be more environmentally friendly, risk-free and created with very little Hazardous Material (HazMat). Bangladesh has proven to be an ideal location for ship-recycling businesses due to its coastal regions and inexpensive labor force. However, this lucrative industry comes with its own set of challenges for local yard owners, investors, and financiers. It is a combination of research and reviewed work to evaluate the present ship recycling scenario for major players of South Asian countries, particularly for Bangladesh by analyzing on ground data of local ship recycling yards of Bangladesh and available information around the globe; which has collected by authors and from secondary method since last few years. To compile this paper, both primary and secondary data were acquired. Primary data was collected during visits to numerous ship-recycling yards, organizations and agencies related to the industry. Secondary information was sourced from a range of articles, research papers, publications and media channels like print, social and electronic outlets.

### Evaluation of Ship Breaking Records of Bangladesh (2015-2022)

According to the number of vessels and amount of LDT scrapped from the year 2015 to July 2022, it is found that over sixty yards (20 groups) have actively participated in ship breaking. Evaluating their continuity of contribution to the ship breaking industry over years, different status has been discovered for the groups. Considering the record and quantity of ship breaking from 2015 to July 2022, the yards have been stated in three categories; active, idle, and inactive. Besides, the Ship Recycling Facilities Plan (SRFP) status of the yards has been

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<sup>18</sup>Business Inspection (YPSA, 2023)n, 2022, Ship Breaking and Recycling Industry of Bangladesh, <https://businessinspection.com.bd/ship-breaking-industry-of-bangladesh> accessed on Feb 21, 2023.

identified by the Ministry of Industry letter regarding SRF dated 04 Nov 2020. Hence, the top twenty group names have been tabulated according to their quantity of LDT scrapped and stated as their continuity of ship breaking over last decade. Here it needs to mention that Active means (which yards were continuous in the ship breaking activities in last 5 years or more), Idle means (which yards were not continuous but participated in the ship breaking activities in last 3-5 years), Inactive means (which yards were neither continuous nor participated in the ship recycling activities in last 3 years).

There are around 150 ship recycling yards in the country; from them only 50-60 are still active. Only 4 of them could have achieved Safety and Operation Compliance (SOC) due to high expenses incurred and a lack of proper initiatives. Local ship-breaking yards are incurring losses as US dollar prices continue to rise in 2023.<sup>19</sup> According to the Breakers and Recyclers Association (BSBRA)'s report, scrap vessel imports declined in 2022-2023 due to the appreciation of USD and LC issues. Specifically, there were 114 vessels imported from January to September of 2022, indicating a decrease of about 49%.<sup>20</sup>

### **Challenges of Local Ship Recycling Industry of Bangladesh**

The Bangladesh Ship Recycling Act was implemented in 2018, and it requires ship-breaking yard owners to abide by the Hong Kong International Convention (HKC) guidelines by 2023. As of now, only a handful of the active recycling yards have achieved Green Passport certification. Meanwhile, around 85 yards are striving to meet these criteria in order to get certified. Yards in Bangladesh are in dire need of renovation and upgrades; however, the owners are not willing to invest the substantial amount of money needed which could be up to Taka 20-30cr for one ship recycling yard. Upgrading all such yards can cost up to tk 3,000- 4,500 cr. In comparison, India and Pakistan have already implemented the HKC standard.<sup>21</sup> Bangladesh is one of the active players in the HKC initiative, alongside India and Turkey who have already accessed it. China is also on the line. Bangladesh has set a goal to achieve accessibility by 2023. Despite the current situation, there are still uncertainties about what can be accomplished in a given time frame. Some of the major hurdles for SBRI in Bangladesh include:

a. According to the UNCTAD report, maritime trade in 2022 were more uncertain and riskier than it was in 2021 due to the complex atmosphere created by current events. Despite this, 2021 was a positive year for maritime trade growth; shipments rose 3.2% to 11 billion tones. Despite a 3.8% dip in 2020, the current growth rate of 1.4% (2023-2027) is substantial and is expected to remain consistent in the coming years, with an average annual increase of 2.1%. This is slightly slower than what was seen in the preceding decades.<sup>22</sup>

b. The post-pandemic world has seen a surge in demand, resulting in an increase in shipping fees. This has created an obstacle for owners of End-of-Life ships to send them to dismantling facilities, while new construction orders have taken a hit.

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<sup>19</sup>Sohel Parvez, Bangladesh: The Daily Star, "Shipbreaking slumps by half amid lower imports", October 12, 2022, <https://www.thedailystar.net/business/economy/news/shipbreaking-slumps-half-amid-lower-imports-3140436>

<sup>20</sup>Sohel Parvez, Bangladesh: The Daily Star, "Shipbreaking slumps by half amid lower imports", October 12, 2022

<sup>21</sup>The Financial Express, <https://today.thefinancialexpress.com.bd/trade-market?date=23-09-2022>

<sup>22</sup>UNCTAD, 2023, accessed on 03 Jan 2023

c. The current geopolitical landscape, compounded by the lingering effects of the Ukraine-Russia conflict and the Covid-19 pandemic, has significantly impacted global businesses. Inflation has risen and pervasive uncertainty has created a challenging environment for the ship recycling industry.

d. It is essential for local ship recycling yards to change their attitude and implement a corporate culture in order to reach their objectives. By taking inspiration from highly efficient industrial nations and implementing suitable strategies and practices, we can be successful in business and remain competitive.

e. Local recycling yards need to take necessary steps to maintain health, hygiene and safety standard as per ILO and IMO regulations.

f. An essential part of being HKC compliant local recycling yards must have SRFP. Local recycling yards need to prepare themselves to ratify HKC and some sort of EU RRC within shortest time, otherwise it will be impossible to continue with the business as no old ships will come to local recycling yards in future.

### **International Regulatory drivers for Ship Recycling**

The nations involved in ship recycling make a significant contribution to their nation's economy, so they are not eager to enact any laws that would regulate the sector. Several global laws have been issued to address sub-par practices across South Asia, which can have a damaging influence on health, security, and the environment. Taking these changes into account will help ensure that these issues are addressed. Given the ineffectiveness of international regulation of ship recycling (Basel Convention) and the non-entry into force of the Hong Kong Convention, the European Union has decided to take action itself. The EU has taken steps to regulate ship recycling and is already implementing parts of the Hong Kong Convention. Regulation No. 1257/2013 on Ship Recycling (EU SRR) was effectively enforced in December 2013, producing tangible results.<sup>23</sup>

In 2009, the International Maritime Organization (IMO) adopted the Hong Kong Convention on Ship Recycling, with the aim of improving safety and environmental protection. Unfortunately, it still has not entered into force after all these years. The EU SR No. 1013/2006, which implements the Basel Convention and its Amendment in Europe, forbids the disposal of hazardous waste to non-OECD countries and prohibits any exports of waste outside the EU/EFTA region for disposal. Effective as of December 31, 2018, the European Union Ship Recycling Regulation (EU SRR) has come into effect. The Regulation requires ship recycling activities to satisfy various environmental and occupational health and safety standards that are more stringent than the Hong Kong Convention. All vessels with European Union flags must be recycled in facilities that have been approved and included in the EU's list of authorized

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<sup>23</sup> <https://britishmarine.com/news-and-advice/advice-and-notice/european-union-ship-recycling-regulation>, accessed on 14 February 2023

locations worldwide. The EU maintains an up-to-date record of these sites for this purpose [table 3].

<i>Ship recycling legislation</i>	<i>Done</i>	<i>Entry into Force</i>	<i>Contracting States</i>
<b><u>The Basel Convention (BC)</u></b> <i>On the control of trans boundary movement of hazardous wastes and their disposal</i>	1989	05.05.1992	186
<b><u>Hong Kong Convention (HKC)</u></b> <i>On the Safe and Environmentally Sound Recycling of Ships.</i>	2009	Not yet in force	17
<b><u>EU Regulation on Ship Recycling (EU SRR)</u></b> <i>Regulation (Eu) No 1257/2013 of the European Parliament and of the Council on ship recycling and amending Regulation (EC) No 1013/2006 and Directive 2009/16/EC</i>	2013	13 December 2013 and fully applicable on 31.12.2018	28 EU Member States

Table 3: Summaries of ship recycling legislations entry into force

Ship recycling was a regular activity in industrialized countries like the USA and UK up until the 20<sup>th</sup> century. In the 1980s, the ship breaking and recycling industry hubs began to move away from North America and Europe to East Asia, with South Asia becoming a major part of the industry during the same decade. The Brussels-based NGO Ship breaking Platform Secretariat released figures showing that between 2012 and 2019, a total of 7,375 ships were dismantled worldwide. Bangladesh, India, and Pakistan have each made significant contributions to ship dismantling in recent years. To be precise, Bangladesh accounts for 23%, India for 32%, and Pakistan for 10%. Specifically, these countries have collectively dismantled 1676, 2335, and 780 ships, respectively. A comparison of the major issues, locations, ships scrapped, and techniques in the biggest ship-recycling countries are outlined in the table 4 below.

**Table 4:** A comparative study among major ship recycling nations

Country	Bangladesh	India	Pakistan	Turkey	China
<b>Methods</b>	<b>Beaching Method</b>	<b>Beaching Method</b>	<b>Beaching Method</b>	<b>Slipway method</b>	<b>Alongside/ Pier Method</b>
	<b>Reasons:</b>	<b>Reasons:</b>	<b>Reasons:</b>	<b>Reasons:</b>	<b>Reasons:</b>
	<ol style="list-style-type: none"> <li>Cheapest method</li> <li>Minimal infrastructure required</li> <li>Includes larger work force</li> <li>Geographical and weather condition</li> </ol>	<ol style="list-style-type: none"> <li>Require less infrastructure</li> <li>Provides huge employments</li> <li>Cheapest method with reasonable profit</li> <li>Geographical situation.</li> </ol>	<ol style="list-style-type: none"> <li>Cheap and profitable.</li> <li>Includes a huge amount of work force.</li> <li>Geographical and weather conditions.</li> </ol>	<ol style="list-style-type: none"> <li>Less tidal variation.</li> <li>Comparatively Safe.</li> <li>The ship is dismantled part by part.</li> <li>Facilitates the control and avoidance of spillage of toxic substances.</li> </ol>	<ol style="list-style-type: none"> <li>Process is done through as systematic way.</li> <li>Less chance of pollution.</li> <li>Independent of tidal variations.</li> <li>Beaching is prohibited In China.</li> </ol>
Major Concerns	<ol style="list-style-type: none"> <li>Beaching method results in pollution and unsafe working conditions.</li> <li>Lack of proper training.</li> <li>Full absence of downstream Hazardous waste management.</li> <li>Bellow standard living conditions, lack of proper medical facilities, Wages lower than living cost.</li> <li>Child labor in a hazardous industry.</li> <li>No strict law</li> </ol>	<ol style="list-style-type: none"> <li>Dismantling of ships in beaching method.</li> <li>Adverse environmental impact caused by toxics paints, slag and debris.</li> <li>Lack of sufficient personal protective equipment (PPE) as well as lack of proper training.</li> <li>Re-sale of asbestos containing materials.</li> <li>No strict law enforcement.</li> </ol>	<ol style="list-style-type: none"> <li>Ship breaking on the unprotected beach which results in pollution and unsafe working conditions.</li> <li>Lack of proper training of the workers.</li> <li>Absence of any adequate downstream hazardous waste management.</li> <li>Poor living condition, lack of proper medical facilities, long working hours.</li> <li>No strict law enforcement.</li> </ol>	<ol style="list-style-type: none"> <li>Conflicts among different yards.</li> <li>Tracking of hazardous wastes downstream.</li> <li>Absence of independent Trade unions.</li> <li>No particular environmental monitoring system of sea, sand &amp; air pollution and scrutiny of landing method.</li> <li>High accident rate.</li> </ol>	<ol style="list-style-type: none"> <li>Conflicts among different yards, the method and technology used.</li> <li>Lack of fully safe asbestos removal.</li> <li>Full absence of independent trade unions and active environmental organizations working on ship recycling.</li> </ol>
Main Location	Chittagong	Alang	Gadani	Aliaga	Shanghai, Xinhui & Dalian
No of Ship dismantled (2012-2022june)	2148	2836	1033	1275	1097
Percentage of ship dismantled (2012-22june)	24.5%	30.9%	11.63%	14.92%	11%

## Conclusion

Recycle a ship is not frequent issue. Actually, old ships after severe hull corrosion, metal fatigue, a lack of spare parts of machinery, and beyond economic use, they have placed for recycling process. A ship can last up to 25 to 30 years and end of its lifespan; they go for recycle to recollect its materials and machinery. The global ship recycling industry dismantles around 1,000 large ocean-going ships annually, including container ships, cargo and bulkers, oil and gas tankers (LNG and LPG), passenger ships, and more, to salvage steel, metals, and recyclable materials<sup>24</sup>. South Asia is the primary hub for ship breaking and recycling operations, with Bangladesh, India, and Pakistan leading the way. This industry has been rapidly expanding in recent years, providing many countries in the region with economic benefits, accounting for 70-80% of the overall share. Currently, 80% of ship-recycling activities take place in three locations in South Asia like Chittagong (Bangladesh), Alang (India), and Gadani (Pakistan). Actually ship breaking industry has made notable contributions to the economy of Bangladesh and is of paramount importance to the macro and micro economies of poverty stricken Bangladesh. However, beaching is heavily used in these areas. Whereas, constructing and running dry docks is quite expensive. More environment concern countries like USA and Europe usually adopt the "dry-dock" technique. However, a few countries in Asia and in Europe have adopted the "alongside or pier breaking" approach instead. Right now, Aliaga in Turkey and a few other places in the European Union are the most vocal against slipway or landing recycling technique.

The Basel Convention prevents the export of waste ships to non-OECD countries. However, this is often circumvented by labeling recycling as taking place in international waters, where the Convention's regulations cannot be enforced. Once the HKC Amendment to the Basel Convention (BC) takes effect, ships will no longer be subject to its scope. Additionally, if handled in accordance with the EU SRR, these vessels are excluded from the convention's purview. For ships in particular, "exporting state" can refer to either the flag state or the country of origin of its beneficial owner. This alternative interpretation is more suitable and accurate. In response to the need for regulation on ship recycling, the International Maritime Organization (IMO) took swift action to create a new convention with legally binding properties. This convention would depend heavily on enforcement from both the flag state and the recycling state. To close all ambiguities of the BC in 2009, the IMO approved the HKC, which holds ship owners responsible for sustainable recycling of ships. Even after a decade; this convention has not been implemented yet. The EU's SRR furthers the goals of the 2009 HKC for Safe and Environmentally Sound Recycling of Ships, while introducing higher safety and environmental measures than those outlined in IMO's HKC. Specifically, the EU's SRR contains standards surpassing those set by IMO. As per EU's SRR, the beaching method has been strictly prohibited and strict regulations relating to the management of hazardous materials and labor rights are in place. Again ship dismantling sites listed by the EU are subject to a much stricter level of monitoring, including third-party certification and auditing, as well as complaints from NGOs if they are concerned that facilities are not following the regulations.

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<sup>24</sup>Hossain, K. A., 2019, "Development of an Assessment Model for Ship Recycling Industry in Bangladesh" Proceedings of the 2nd International Conference on Industrial and Mechanical Engineering and Operations Management (IMEOM), Dhaka, Bangladesh, December 12-13, 2019

The HKC does not provide the necessary security criteria for ship breaking, making it crucial for yards to be listed in the EU directory. This will guarantee that a yard has adhered to a quality assurance program that meets an acceptable standard. To provide clear legal regulations and reduce administrative complexity, ships specified in the new legislation will be excluded from the scope of the Waste Shipment Regulation. However, non-EU flagged vessels sold for scrapping while in European waters will still be subject to this regulation. The EU's Ship Recycling Regulation seeks to achieve early ratification of the HKC, thereby promoting a global, rule-based system. Experts are in agreement that global regulations should be present for the shipping industry. However, there is disagreement on whether the HKC is an appropriate solution, since it does not meet the standards set by the EU Ship Recycling Regulation. European ships are usually recycled according to the EU's SRR or HKC regulations. Otherwise, the BC guidelines come into effect, which can be quite tedious and difficult to manage. In legal point of view, the HKC has yet to be enforced; however, it can still serve as a guideline for non-EU flagged vessels; when practicing due diligence. Furthermore, the intentions behind this protocol are accepted and recognized internationally.

One of the mandates of HKC is that an approved ship breaking facility has to create a SRFP. The SRFP provides crucial information regarding a ship recycling facility, including its layout, water depth, accessibility, routine maintenance, dredging, etc. South Asian recycling plants largely employ the open beaching system. While this method has been profitable, it can also release hazardous materials into the coastal region. As of recently, the EU SRR is in effect. This law states that all ships registered under the EU flag must be recycled in a facility from the European List and forbids beaching as a valid recycling method. Countries such as China, Turkey and India are vigorously competing to bring their ship recycling facilities in line with global standards. Bangladesh's ship recycling yards need to fortify their operations in order to maintain global standards and remain competitive in the world. Necessary improvements must be taken in order to ensure compliance with international regulations. It is absolutely essential for the country to succeed that we take a close look at existing ship recycling facilities and improve as per global standard; otherwise, we cannot survive in the global competition.



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