

Evaluation of Present Ship Recycling Scenario and Opportunity for Bangladesh

Golam Mohiuddin*, Khandokar Akhter Hossain and Mir Tareque Ali

Department of Naval Architecture and Marine Engineering, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh

Abstract

Ship recycling is a rapidly developing global industry that involves dismantling and scrapping ships when they are no longer usable. Every year 1000 old ships are recycled for scrap, with South Asia being the hub of this thriving ship breaking and recycling market. In Bangladesh, the industry began with the dismantling of stranded vessels and has since become a lucrative enterprise. The industry is an invaluable source of jobs and prosperity for many people living in poverty-stricken regions. Coastal zone management greatly suffers from the global shipping industry, particularly from environmental deterioration, legal obligations and labour issues.

Shockingly, India, Bangladesh & Pakistan are the frontrunners in this industry. Despite certain restrictions limitations, the ship recycling industry of Bangladesh has been significantly contributing to the country's Gross Domestic Product (GDP) and its overall socio-economic development. In recent times, however, its market share has been declining as a result of stringent environmental regulations. In comparison to its competitors, this reviewed article has put in substantial research effort to evaluate the state of global ship recycling and provide insights into the future of local ship recycling industry.

Keywords: Ship breaking and recycling • Green Recycling • Beaching • EOL ships • HSE aspect

Introduction

The daily operations of ships can result in the accumulation of hundreds of tons of garbage due to excessive waste disposal. Additionally, the decommissioning of ships at the end of their service adds a huge amount of unwanted waste materials into the environment, which can potentially have disastrous effects. Ship recycling is a process of carefully dismantling obsolete vessels to reclaim reusable components, aiming to protect the environment and ensure safety standards are met. It's an ingenious reverse engineering technique that has become increasingly popular for end-of-life ships (EOL). Green ship recycling has been implemented around the world as a beneficial alternative to other ship-breaking practices that have a negative impact on the environment. Ship recycling is a costly endeavour, especially if one tries to do it perfectly.

However, combining existing standard practices, such as the beaching method in South Asia, with green recycling can save a substantial amount of money while still being environmentally friendly [1]. The ship breaking industry in Bangladesh first began in the 1960s when a Greek vessel named the MD Alpine became stranded in Sitakund, Chittogram due to a destructive cyclone. This prompted local businesses like the Chittagong Steel House to purchase the vessel and recycle its parts. The consequence of this was a large expansion in the industry. During Bangladesh's War of Independence in 1971, a bombing resulted in the damage of a Pakistani vessel known as 'Al Abbas'. After being abandoned at sea, the vessel was salvaged and taken to Fauzdarhat seashore. In 1974, Karnafully Metal Works Ltd bought it as scrap, thus kickstarting the commercial ship breaking industry in Bangladesh. This industry really boomed

during the 1980s [2]. The ship-breaking 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-breaking 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 labour 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, labour salaries were among the lowest in the world and there were no standards for occupational health and labour safety [3]. Approximately 150 ship breaking yards are located in Chittogram, 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 [4]. Ship breaking in Bangladesh is a labour-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-breaking/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 analysing 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.

***Address for Correspondence:** Golam Mohiuddin, Department of Naval Architecture and Marine Engineering, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh, E-mail: mohi1356@yahoo.com

Copyright: © 2023 Mohiuddin G, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Received: 01 March, 2023, Manuscript No. Jeat-23-92536; **Editor Assigned:** 03 March, 2023, Pre-QC No. P-92536; **Reviewed:** 15 March, 2023, QC No. Q-92536; **Revised:** 22 March, 2023 Manuscript No. R-92536; **Published:** 29 March, 2023, DOI: 10.37421/2161-0525.2022.13.704

Global and local ship recycling industry

Approximately 1,000 large-scale vessels, such as container ships, cargo and bulkers, oil and gas tankers (LNG, LPG) and passenger ships, are recycled across the globe every year. This process helps to recover steel and other precious metals or recyclable items from these vessels. Currently, most of the ship recycling activities around the world is conducted in five countries: India, Bangladesh, Pakistan, China and Turkey. These countries have become hubs for all ship recycling activities due to their advantageous geographic location and resource capabilities. North America (the United States, Canada and Mexico) and the European Union (Denmark, Belgium and the United Kingdom, among others) have the capacity for more expansion. Ship recycling is currently a booming business in South Asia. Big players in this market such as India, Bangladesh, Pakistan, China and Turkey have their own yards where they perform these activities [5,6]. According to (Table 1) of 2020, some of the most

popular ship recyclers were the leading destinations in terms of Light Dead-Weight Tons (LDT) recycled. These recyclers have been globally trusted for their services.

Every year, some 200 derelict ships are recycled in scrapyards at the port city of Chattogram in Bangladesh. This process helps to reduce the amount of waste that would otherwise be released into our environment (Figures 1 and 2) displays the number of different ship categories recycled in Bangladesh from 2009 to 2015. It provides a clear visual representation to make it easier to comprehend. Bangladesh has been a hub for recycling old, obsolete ships for many years. According to research, about 2 million LDT of different types of ships are recycled each year there (Figure 3) demonstrates the reusable material factor and materials produced from these ships annually. Pakistan and India have seen the highest rise in share, with 14.7% and 3.2% respectively (UNCTAD 2021) [7]. On the other hand, Bangladesh and China saw a reduction

Table 1. Global ship recycles in LDT in thousand gross tons sold in 2020 [7].

Ship Types	Bangladesh	India	Pakistan	Turkey	China	Rest of the world	World Total	Percentage
Bulk Carries	5,254	1,317	1,718	34	125	61	8,509	48.9
Container	160	1,428	282	206	-	68	2,143	12.3
Oil Tankers	616	410	617	159	10	226	2,038	11.7
Offshore supply	125	257	4	308	3	273	969	5.6
Ferries	26	279	-	545	3	26	879	5.1
General cargo	176	219	175	203	47	29	848	4.9
LPG/ LNG	169	241	-	8	-	176	594	3.4
Chemical Tankers	12	125	94	1	-	10	241	1.4
Others	157	786	-	135	9	93	1,180	6.8
Total	6,694	5,061	2,890	1,598	195	962	17,401	100
Percentage	38.5	29.1	16.6	9.2	1.1	5.5	100	(%)



Figure 1. Locations of ship breaking yards in Bangladesh.

Ship types recycled in Bangladesh

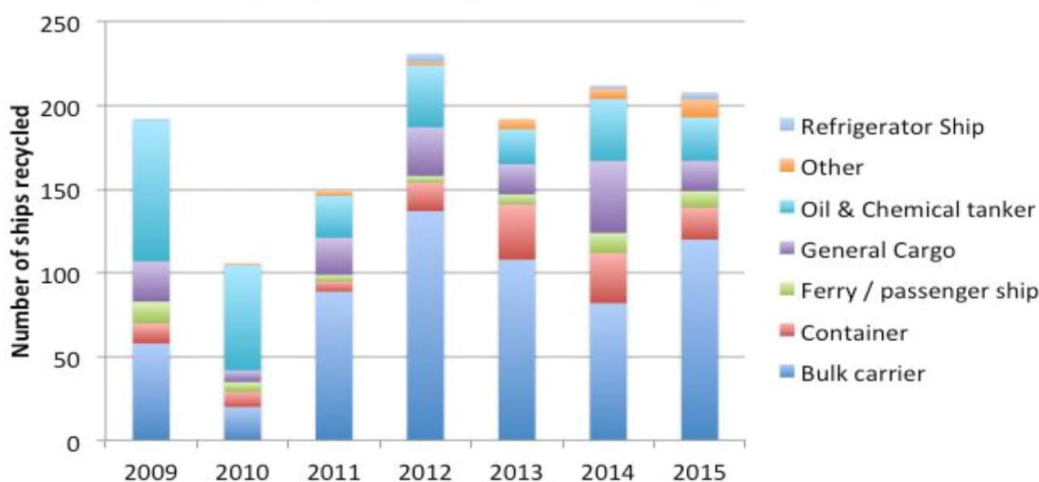


Figure 2. Number of ships recycled annually in Bangladesh (From 2009 to 2015) [9].

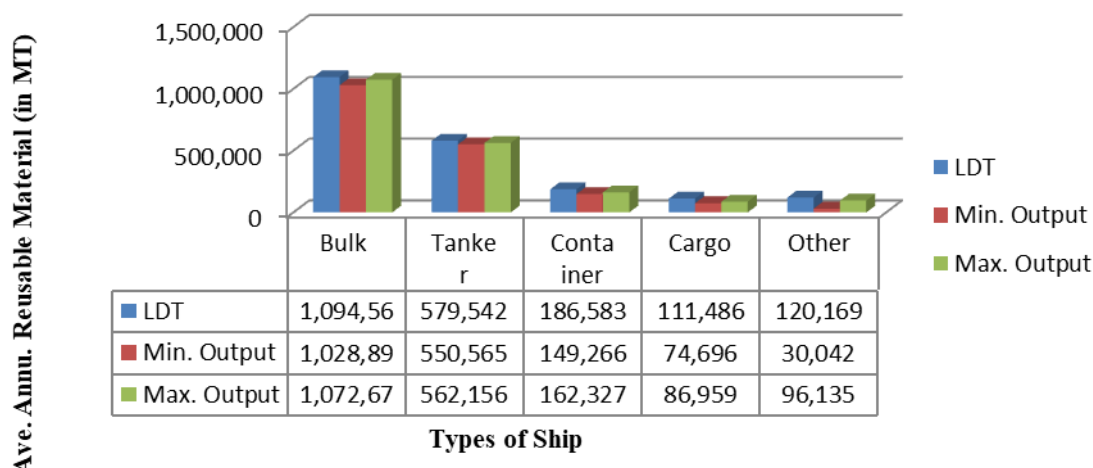


Figure 3. Average annual LDT and reusable material output of BSRI (2009 to 2015) [10].

by 15% and 2%, respectively. This decrease in market share of China is likely due to their ban on international ships recycling [8,9]. Unfortunately, because of government regulations, Bangladesh's market share has been on the decline.

History of Bangladesh ship recycling industry

The start of local ship recycling in Chittogram Bangladesh was ironic, as it came about after M D Alpine, a Greek ship that had been brought ashore by the 1960's cyclone at Fauzdarhat. In 1965, the abundant ship was disassembled by Chittagong Steel House [10,11]. Later, the Pakistani ship Al Abbas was salvaged in 1974 and Karnafully Metal Works disassembled it near Fauzdarhat [12]. These events sparked the interest of a few business owners to explore the potential of the shoreline near Fauzdarhat for beach development. Over time, the shipment recycling industry in Chattogram has experienced both flourishing and depleting stages before becoming the world's biggest. Presently, the SBRI spans over a 20 km stretch of coastline from Bhatiyari to Fauzdarhat and then on to Baroiyawlia [13]. "SBRI consists of more than one hundred ship recycling yards registered, with a few dozen in regular operation. The industry directly employs over 200,000 labourers and accounts for the supply of more than half of all steel products in Bangladesh [14]. This industry indirectly provides livelihood to over 1 million people, helping them make a living.

Assessment of Bangladesh ship recycling industry

The bustling development of this sector in this region has been largely encouraged due to a multitude of influences. One of the major reasons why this beach is so popular is the ideal beaching conditions, which are a natural blessing. Additionally, its proximity to Chattogram, which has a large concentration of steel re-rolling mills that utilize most of its output from the industry also contributes to its appeal. The Bangladeshi economy has seen a surge of success due to the high number of risk-taking entrepreneurs, access to an abundance of labour from the northern districts and laws that have allowed operations in this sector for many years despite not being officially recognized as an industry. The local market is seeing a strong growth in the demand for scrap ferrous and non-ferrous metals, other cost-effective retrieved materials from the industry and financing opportunities from official banks & loaners. Upstream and downstream industries have been growing exponentially, leading to the formation of an informal interdependent industrial symbiosis. This has improved the efficiency of the entire system greatly. It's remarkable to note that many products of the EOL ships are sold in the local market and are either processed or utilized by industries that have a direct or indirect correlation to recycling yards. Currently, the SBRI is regulated by the Ship Breaking and Ship Recycling Rules 2011 under the Ministry of Industries (MOI). Additionally, it is supervised by the Department of Environment (DoE) under MOEF with Environmental Protection Act 1995 and Environmental Protection Rules 1997

Since the implementation of safety regulations and the taking of corrective measures, the local yards have seen a marked improvement in labour safety and environmental management standards [15]. The Bangladeshi Government recently set up the Ship Building and Ship Recycling Board (SBSRB) as a

one-stop solution provider under the Ministry of Industries (MOI). This aims to simplify the process for businesses in the shipbuilding and ship recycling sectors. We are collaborating with other government departments and ministries to provide a one-stop solution for ship breaking, recycling and other related activities, allowing users to easily get the required permissions/certificates.

The Department of Environment (DoE) is taking steps to ensure ecological protection. This includes issuing an ECC before any industrial establishment can be set up in Bangladesh, including ship recycling yards. Thus, they are working hard to maintain sustainable environmental governance and pollution control. In addition, it gives authorization to deal with the hazardous waste created during a ship recycling process [16]. Currently, Bangladesh's major recycling yards are carrying out a successful recycling procedure and are on the verge of fulfilling international HSE guidelines in terms of health, safety and environment.

SWOT analysis of local ship breaking

STRENGTH

1. Cheapest & easiest method of Ship recycling
2. Less infrastructure required
3. Cheap and abundance of work force
4. Suitable, Seacoast and compatible

WEAKNESS

1. Spillage of the ship causes pollution
2. Containment of the Hazmat
3. Cheap and abundance of work force
4. Yard management

THREAT

1. HSE aspect of workers
2. Environmental Pollution
3. Global and Local Rules & regulations Green Recycling method

OPPORTUNITIES

1. Ensure optimum infrastructures
2. Maintain safety and work environment
3. Ensure sustainable recycling method
4. Future ships will be more environment friendly.
5. Ship recycling demand, supply and market forecasting

Businesses use forecasting to anticipate future events by studying existing and current data. One such area of forecasting is ship recycling demand, which predicts the number of end-of-life ships that can be dismantled in a

Demand-side drivers

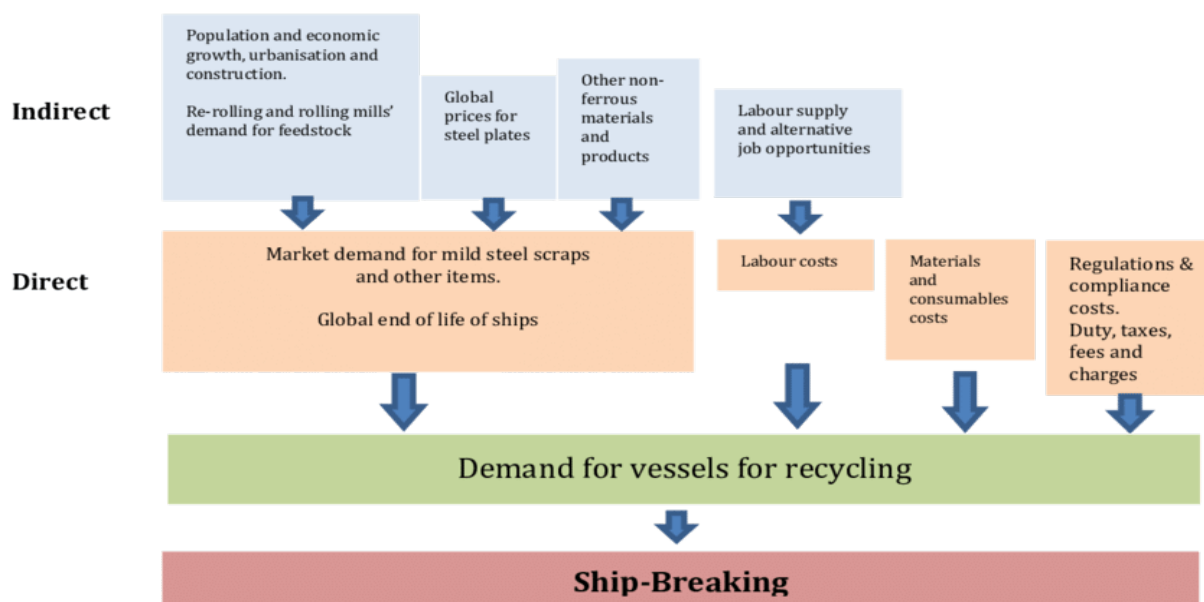


Figure 4. Factors that influence ship recycling demand [17].

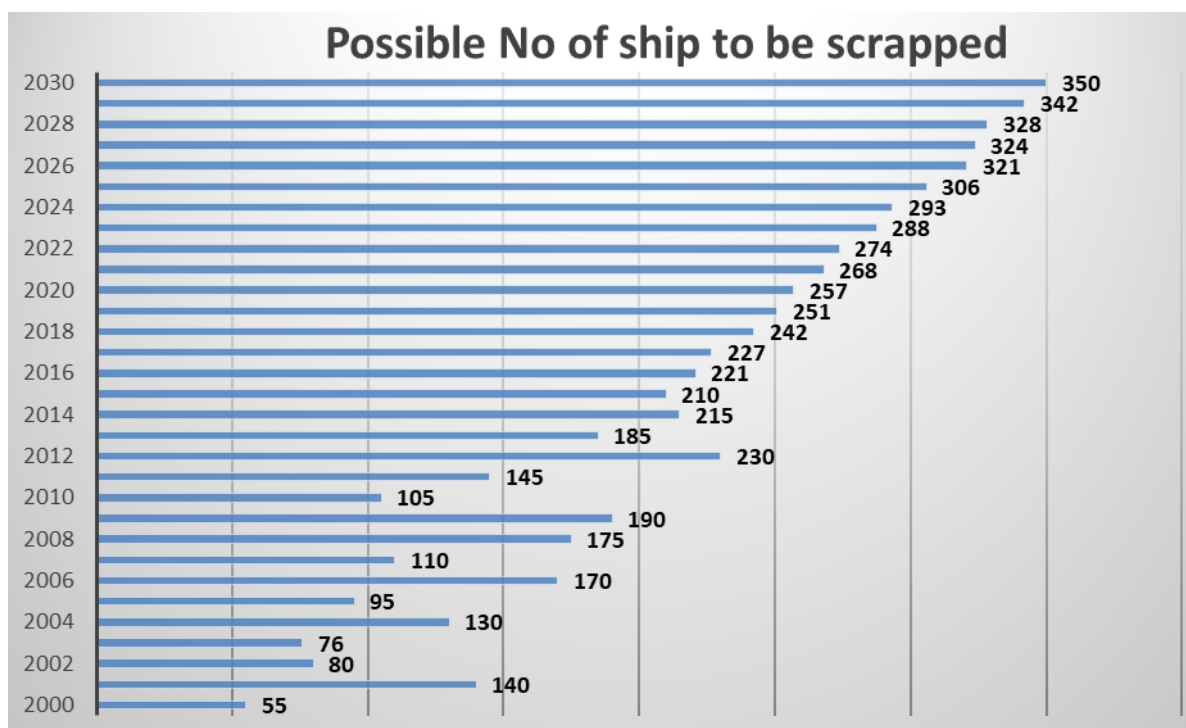


Figure 5. Possible number of EOL ships to be scrapped in BD within 2030.

certain period. Businesses can benefit from aided planning, which helps them to adjust to unexpected conditions. Ship dismantling is driven by two primary elements: cost efficiency and regulatory considerations. Many things have to be accounted for when determining the cost of a project, such as scrap steel prices, freight market conditions and dismantling costs. Fuel prices, labour costs and shipbuilding costs are also important factors to consider. Rules and regulations must be followed and options for conversion must be taken into account when making decisions [17].

Linear regression was used to predict the market outlook, taking into account the potential number of ships scrapped, estimated earnings and factors that affect supply and demand. All these factors were taken into consideration to come up with an accurate forecast. By using past and present data, alongside

other parameters, we can predict the probable future values by making use of the forecasting function in Microsoft Excel (Figures 4-6) displays the potential count of ships reaching the end of their lifecycles along with the predicted income that could be generated from recycling them. The data reveals that the ship recycling sector is generating remarkable earnings, which will make a meaningful contribution to our nation's economy. In the last few years, indicators such as steel demand, scrap materials and other relevant factors have remained unchanged. If this trend continues, ship recycling has a very positive outlook in terms of potential growth.

Contribution in national and socio- economic development of Bangladesh

The recycling industry has had a significant effect on the national economy, leading to an average growth of 14% annually since 1980. Its contribution to the overall success of our country is undeniable. Presently, the Bangladeshi ship recycling industry is churning out an annual revenue of 12,750 crore BDT. The industry is creating scope of jobs for people in poverty-ridden areas, with an estimated two lacs individuals directly involved [18]. This has been a great way to enhance the livelihoods of many. The industry has a massive reach with more than a million individuals being part of it either directly or indirectly. Every year, US\$130 million in annual revenue is accumulated from the industry. (Figure 7) illustrates the trend of Iron and Steel material generated from scrapped ships in Bangladesh (Figure 6) demonstrates the earning pattern of the ship recycling industry in Bangladesh. It is estimated that up to 60% of materials and machinery for local ship construction comes from this sector. Moreover, it

is estimated that ship breaking industry generates around US\$ 1 billion for the national economy [19-21].

The Bangladesh customs authorities revealed that 250 scrap ships were brought in during the 2015-16 fiscal year and Tk 8.22 billion was paid as revenue to the government. During the 2016-17 financial year, 188 scrap ships were imported and Tk 6.32 billion was paid in revenue. The number increased to 202 ships the following year, bringing in a total revenue of Tk 5.96 billion (Tk 596 crore). This further grew to 272 ships during FY19 with a revenue collection of Tk 7.92 billion (TK 792 crore). Over the last 11 months of FY20, only 138 ships were imported which yielded the National Board of Revenue (NBR) Taka 4.78 billion (TK 478 crore). Custom duties, income taxes and value added taxes amounting to an average of Taka 5 billion are paid each year by the ship

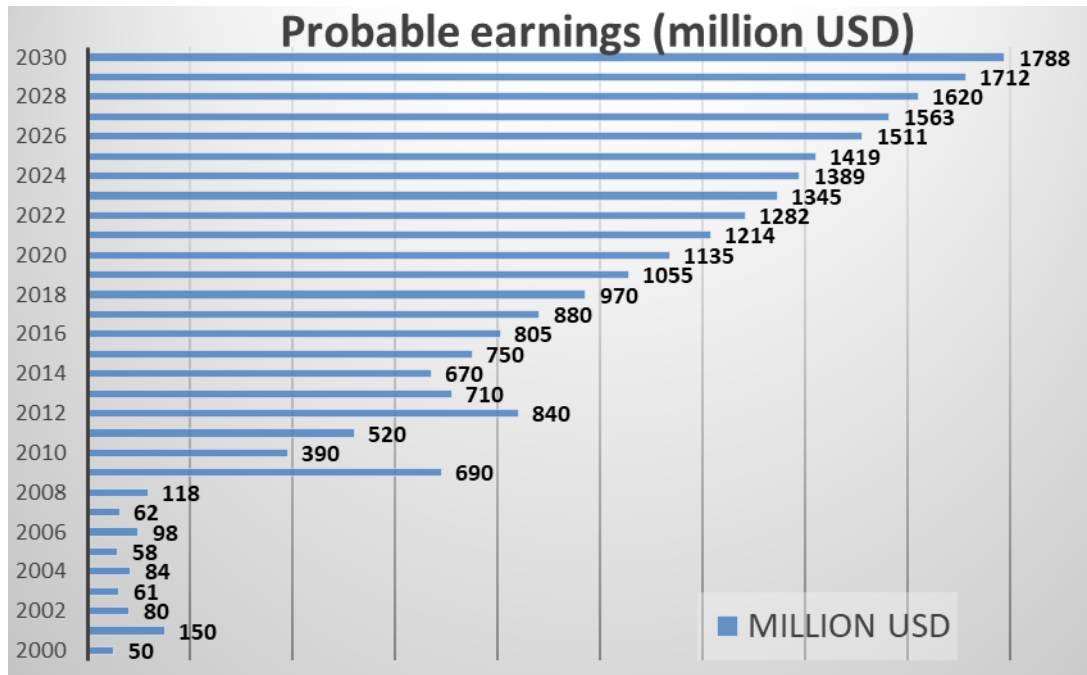


Figure 6. Probable earnings from scrapped ship in BD within 2030.

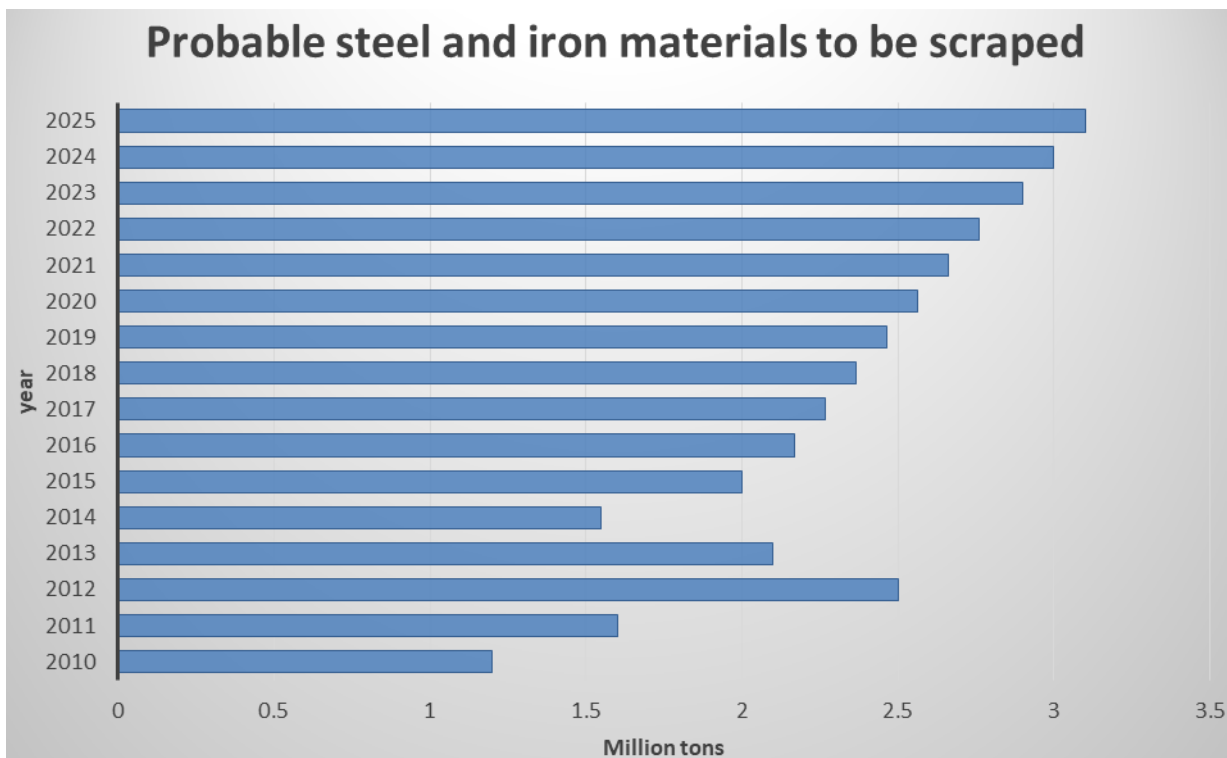


Figure 7. Probable iron and steel materials produced from scrapped ships within 2025.

recycling industry. The ship recycling industry pays considerable fees & charges to the ministry of industry according to the regulations in place. As displayed in (Figures 8 and 9) there is a trend of customs duty, income tax and VAT payments being made by the same. Illustrated in (Figure 10) is the paid fees and charges to the local Government of BD between FY 2011-2015.

Bangladesh is currently taking major strides in its infrastructure growth, with ambitious megaprojects such as the Padma Bridge, Metro Rail, Elevated Expressway and Rooppur Nuclear Power Plant to name a few. Additionally, the Karnafuli Tunnel and Bay Terminal are also making their presence felt. Together, these projects provide a tremendous boost to the country's infrastructure needs. There is a strong demand for steel in the country due to rapid economic growth. People are more likely to invest in and build new homes and infrastructure, which has led to greater need of steel and other materials. The ever-growing demand for domestic steel has put pressure on local steel mills to secure raw materials from the ship recycling industry. As a result, the latter has experienced steady growth that keeps up with the rising need for steel [22].

Case Presentation

Bangladesh topped the global rankings in ship recycling in 2021 with 254 ships being scrapped. This constituted 763 ships worldwide a significantly higher number compared to the previous year [23-25]. According to a UNCTAD report, Bangladesh recycled 8.02 million tons of end-of life ships in the given

period, which is 52.4% of the global total - 57% were oil tankers, while 25% were bulk carriers and 9% were liquefied gas carriers. In 2021, Bangladesh has seen a significant increase in their figures for recycling oil tankers (54%), bulk carriers (18.4%) and liquefied gas carriers (5%) when compared to 2020 (Figure 11) showcases the statistics regarding recycled ships by major vessel types this year. Ship breaking Platform's data from January to June 2022 showed a significant 59% reduction in scrap-ship imports (64 ships) due to financial constraints and other demand-side issues, compared to India's drop from 124 to 88 [26].

Results and Discussion

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 shipbreaking 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 [27]. 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

Estimated earnings from 2000-2015

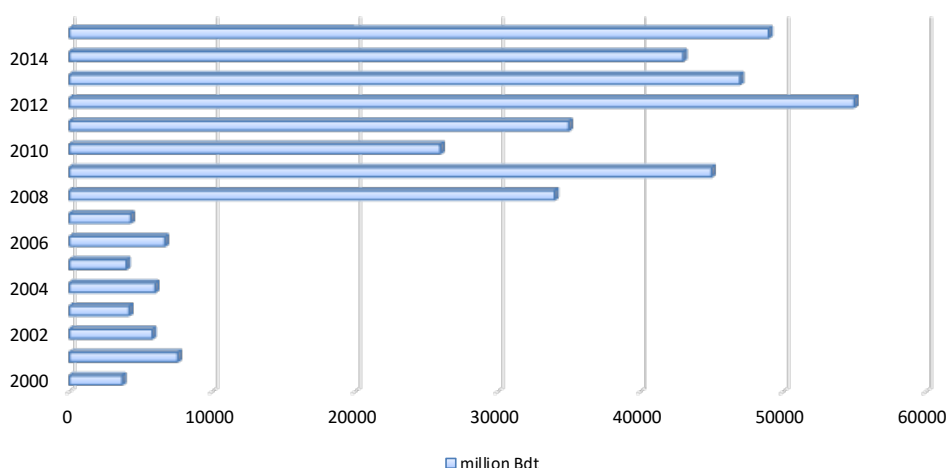


Figure 8. Earning from ship recycling sector in Bangladesh.

CUSTOM DUTY, INCOME TAX & VAT PAID BY THE SHIP RECYCLING SECTOR

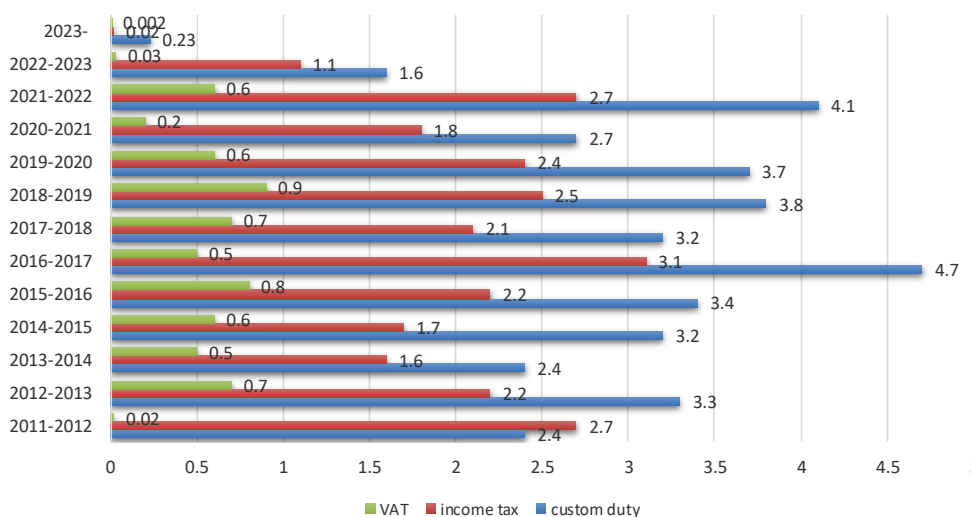


Figure 9. Custom duty, income tax and VAT paid by the ship recycling sector [20].

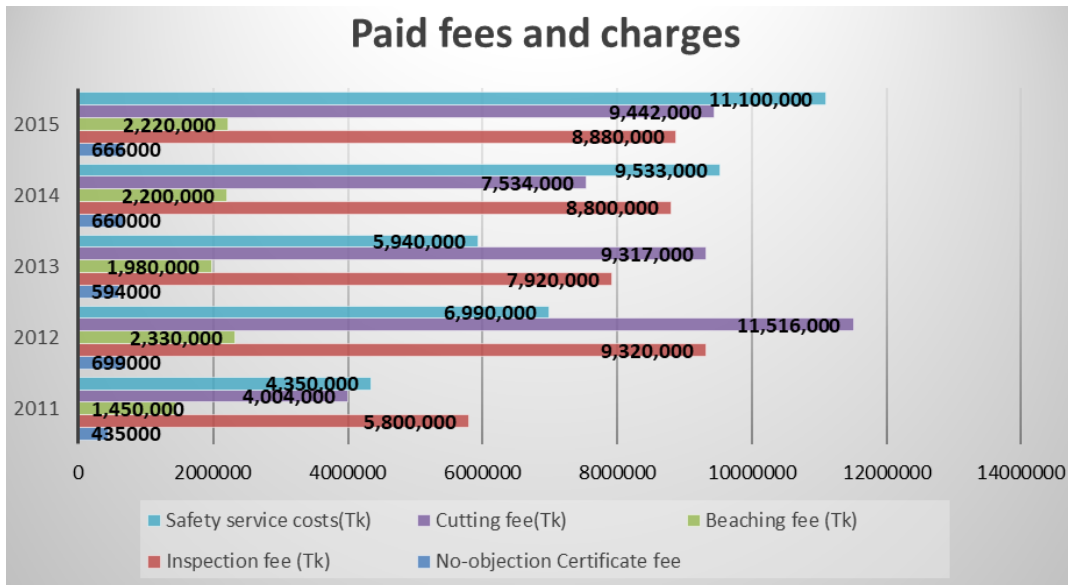


Figure 10. Paid fees and charges to government in FY 2011-2015 [21].

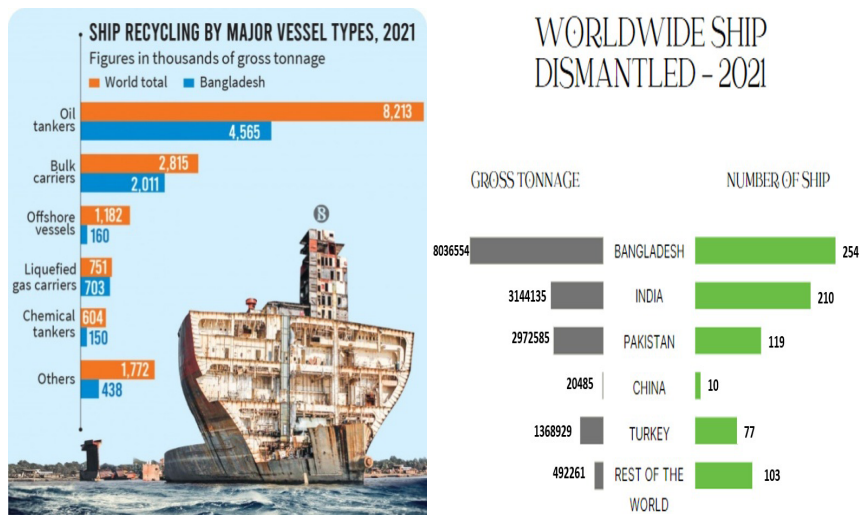


Figure 11. Ship recycling by major vessel types 2021 [24,25].

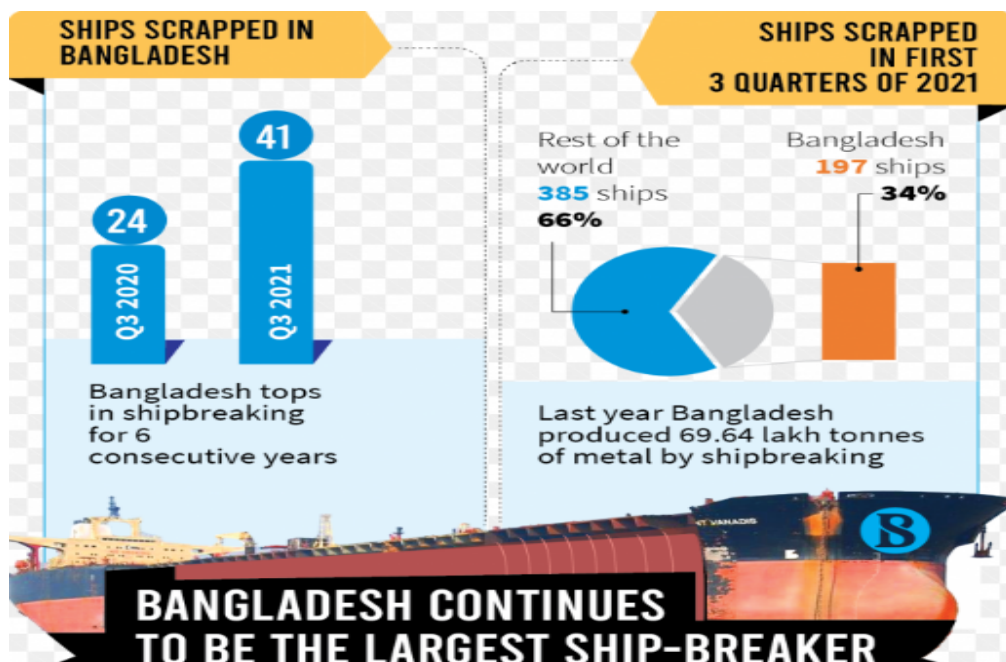


Figure 12. Increment of ship breaking rate over the year.

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:

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 [28,29].

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.

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

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.

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 shipbreaking. 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 shipbreaking 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 have been identified by the Ministry of Industry letter regarding SRFP 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 breaking activities in last 3 years). Top twenty ship recycling groups and their status has been shown in (Table 2) below.

There are many groups which have active participation in shipbreaking over few years. Besides some groups have been at the top according to the quantity of LDT scrapped but did not continue this ship-breaking industry for long. According to their record of continuity, a graphical representation of some shipbreaking groups has introduced and shown in (Figure 12) below. In the past,

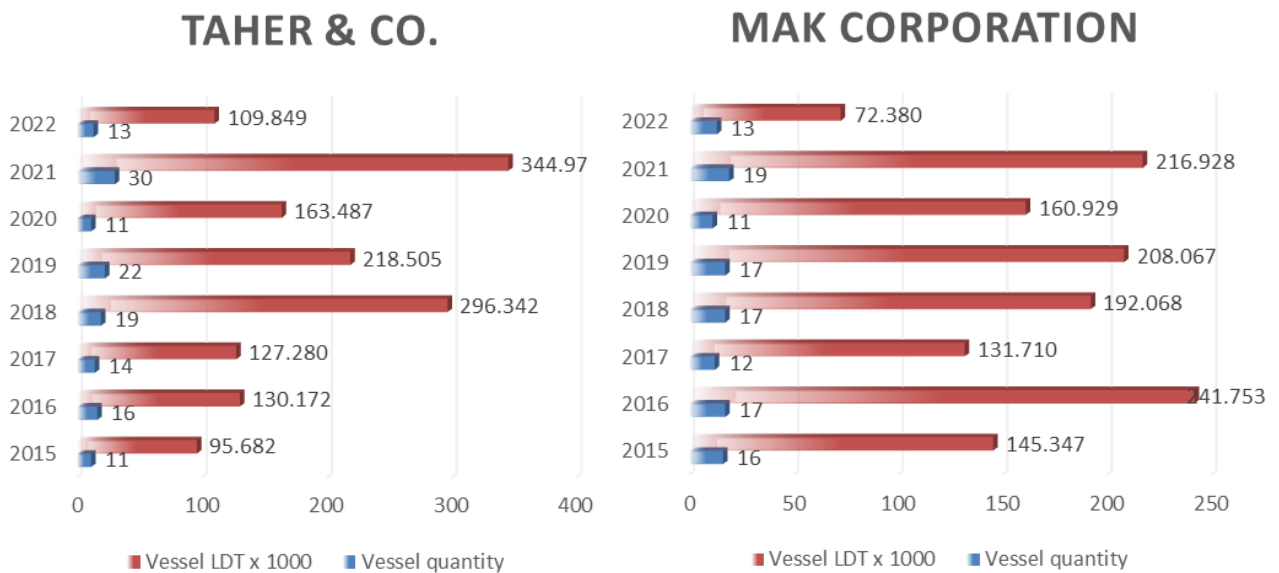


Figure 13. Graphical representation of sample shipyards showing their consistency in the ship breaking industry.

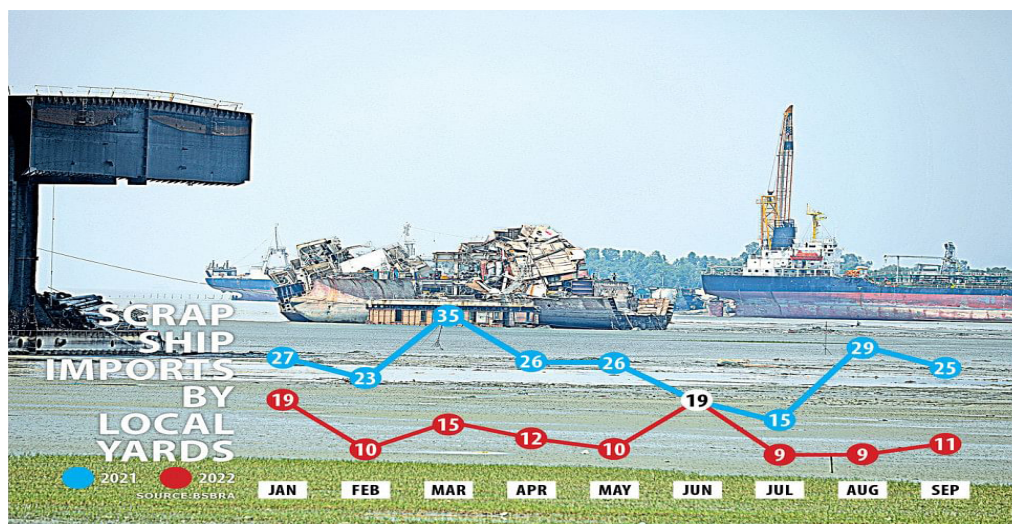


Figure 14. Down trend of ship breaking rate over the year (2021-2022).

Table 2. Top twenty groups as per their quantity of vessel scrapped.

S.NO	Group	Yard	Present Status	SRFP Status
	K R	SNT Ship Recycling	Active	Submitted
		King Steel	Active	Not submitted
		K R Steel	Active	Submitted
		K R Ship Recycling Yard	Active	Submitted
		N B Steel	Idle	Not submitted
2.	MAK Corporation	Master & Brothers	Active	Submitted
		M.A. Ship Breaking	Active	Submitted
		Mother Steel Ltd	Active	Submitted
		A P S Corporation	Idle	Submitted
		Z H Enterprise	Active	Submitted
		Mak Corporation	Active	Submitted
		Motaleb Steel	Active	Submitted
3.	Taher & Co.	GOLDEN Iron Works Ltd	Active	Submitted
		H M Steel & Industry Ltd	Active	Submitted
		T R Ship Breakers Ltd	Active	Not submitted
		Taher & Co. Ltd	Active	Not submitted
		Taseen Steel	Active	Not submitted
		Golden Ispat	Active	Submitted
		H M Ship Bre. Ind. Ltd	Idle	Submitted
		Taher Ship Bre. & Recy	Idle	Not submitted
4.	SN Corporation	Kadamrasul steel ship breaking	Idle	Not submitted
		S N Corporation	Active	Approved & SOC by IACS
5.	S L	S L Ship Reprocess	Inactive	Submitted
		S L Steel	Active	Submitted
6.	ASADI	Asadi Steel Enterprise	Active	Submitted
		Jamuna Ship Breakers	Active	Submitted
7.	Arefin Enterprise	Arefin Enterprise	Active	Submitted
		S.H Enterprise	Active	Not submitted
		Sea Shore International	Active	Not submitted
		Janata Steels Ltd.	Active	Submitted
8.	Simni	Simni Ship Recycling	Active	Submitted
9.	Kabir Steel	Kabir Steel	Active	Approved & SOC by IACS
		Khaja Ship Breaking	Active	Submitted
10.	Crystal Shippers	Crystal shippers Ltd.	Active	Submitted
11.	Haji Babul Ho.	Pacific HSteelent	Active	Submitted
		Pacific steel enterprise	Active	Submitted
12.	Macca	Asian Marine	Active	Submitted
13.	Ziri	ZiriSubader Steel Mills	Active	Not submitted
		Ziri subedar steel re-rolling mill	Inactive	Submitted
		Ferdous Steel	Active	Submitted
14.	PHP	PHP Ship Recy	Active	Approved & SOC by IACS
		Premium Trade Cor.	Active	Submitted
15.	Premium Trade	Mahinur Ship	Active	Not submitted
		Chittagong Ship B & R Ind.	Active	submitted
16.	KSB	KSB	Active	Submitted
		Ocean Ispat	Active	Submitted
17.	Lalbag	Lalbag Ship	Active	Submitted
		S A ship breakers	Idle	Submitted
18.	Sagarika	R A ship breaking	Active	Submitted
		Sagarika ship breaking ind	Active	Submitted
19.	SAM	M M Ship Breaking	Active	Submitted
		SAM steel	Active	Submitted

there used to be around 150 ship-breaking yards in the country but 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. 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%. The graphs and tables below in (Figures 13 and 14) and (Table 3) demonstrate a decrease in the rate of ship breaking by local yards.

Table 3. Import of scrap vessels in FY 2019-2022.

Import of Scrap vessels (Weight in tonnes; Source: BSBRA)		
Year	No. of vessels	Total weight
2019	206	23.9
2020	228	20.69
2021	280	27.58
2022	151	11.47

Conclusion

In countries like Bangladesh, India and Pakistan, the intentional beaching of ships has become standard practice over time. Due to a lack of preventive measures, numerous ships have been left stranded ashore. This problem has become quite common and often results in the vessels being dismantled by locals. The recycling of old, obsolete vessels is done rather efficiently in those countries, though it lacks the professional touch that would be expected. Nevertheless, they are doing a commendable job. Representatives of the shipping industry have urged the European Union to include certain recycling yards in its authorized list. At the same time they want all IMO member states to meet the conditions of The Hong Kong Convention, so that its implementation can be carried out with haste. Ship recycling practices will continue to evolve and become more efficient, with HKC-certified yards becoming the go-to option for all ship owners. Adopting these standards is no longer an exception, but it has become the norm. For effective and sustainable ship recycling practices, it's critical that the key players in South Asia (India, Pakistan and Bangladesh)

Collaborate together. Doing so will allow for viable standards to be developed and implemented. To meet the requirements of the Hong Kong Convention (HKC) and gain approved standards from EU regulation, Statements of Compliance (SoC) must be followed and a sustainable ship recycling process implemented. The Ship breaking and Recycling Industries (SBRI) currently has around 150 registered yards for ship recycling, of which a few dozen are actively operational. To ensure safer ship dismantling practices, the beaching method is to be avoided at all cost. The ship recycling industry in Bangladesh is an important part of their economy, with over 200,000 labourers employed by it. It provides a significant portion of steel products within the country and also other useful materials and equipment

According to the Bangladesh Ship Breakers and Recyclers Association (BBSRA), in 2022, there was a significant decrease of 27% observed in the total number of scrap vessels imported as compared to 2019. This was accompanied by an even more drastic reduction of 52% in their overall weight.³⁴ The beach environment has supported the success of this sector in multiple ways. Not only is it great for a variety of activities, but it's closely located to Chittogram's industrial center which has a large demand for steel reolling mills. This industry largely depends on the production from this region. Legislation has enabled many to expand their risk-taking potential. This has motivated more individuals to pursue ambitious projects, consequently boosting the nation's economic growth rate. This massive amount of human labor has allowed scrap metal companies to remain lucrative and steady in the long term.

Both ferrous and non-ferrous metals have been successfully turning a profit for numerous years. As well as the cheaper materials recovered from manufacturing, financial institutions (formal and informal) have made accessing finance easier, while a number of different upstream and downstream businesses have contributed to building an informal industrial network with each industry relying on another. In 2011, two key regulations were implemented by the Ministry of Industry to oversee Ship Breaking and Recycling, these being The Ship Breaking and Recycling Rules 2011 and the Environmental Protection Act 1995. The Ship Breaking Regulatory Authority was then formed to abide by these laws. In order to safeguard the environment, the Ministry of Environment and Forest has laid out the Environmental Protection Rules 1997. These regulations are essential for preventing environmental damage and keeping our planet healthy. The Department of Environment is solely responsible for enforcing the regulations. Before participation in any activities, ship recycling yards must acquire authorization from the DoE to continue their operations. This authorization is known as an Environmental Compliance Certificate (ECC). Yards are doing their best to keep their workers safe and have also become aware of the need for environmental conservation. As a result, some have been able to meet international standards in terms of green ship-recycling practices.

Acknowledgement

None.

Conflict of interest

None.

References

- Hossain, Khandakar Akhter and NM Golam Zakaria. "Proposed viable ship recycling process for south East Asian recycling yards especially for Bangladesh." *ICMT, MARTEC*. 2018.
- Hossain, A. "Development of an assessment model for ship recycling industry in Bangladesh." *IMEOM* (2019): 279-293.
- <https://shipbreakingbd.info/overview-of-ship-breaking>. February 15 (2023).
- <https://businessinspection.com.bd/ship-breaking-industry-of-bangladesh>. February 14 (2023).
- <https://shipbreakingbd.info/overview-of-ship-breaking/> March 11 (2023).
- Hossain, A. "Development of an assessment model for ship recycling industry in Bangladesh." (2019): 279-293.
- UNCTAD, 2023, <https://stats.unctad.org/shiprecycling>. January, 03 (2023).
- Hossain, K. A. "Calculation of yearly output of reusable material of ship recycling industry of Bangladesh." *Recent adv petrochem sci* 5 (2018).
- Khandakar Akhter Hossain. "Sustainable ship recycling methods and process for global major ship recycling players". *Open Acc J of Toxicol* (2018).
- Hossain, Kh Akhter, K. Shahriar Iqbal and NM Golam Zakaria. "Ship recycling prospects in Bangladesh." *Proceedings of MARTEC* (2010): 297-302.
- Hossain, Khandakar Akhter. "Overview of ship recycling industry of Bangladesh." *J Environ Anal Toxicol* 5 (2015): 1-7.
- Hossain, K. A. "Ship recycling practice and annual reusable material output from Bangladesh ship recycling industry." *J Fundam Renewable Energy Appl* 7 (2017).
- Hossain, Khandakar Akhter. "Ship recycling status of Bangladesh and annual reusable material output." *J Toxicol* 2 (2017).
- Hossain, Khandakar Akhter and NM Golam Zakaria. "Proposed viable ship recycling process for south East Asian recycling yards especially for Bangladesh." *MARTEC*. 2018.
- Hossain, K. A. "Material Flow Analysis (MFA) is a better tool to calculating reusable material for ship recycling." *ICMT, UTM, Malaysia*, (2018): 13-14.
- Ahammad, Helal and Mohammad Sujauddin. "Contributions of ship recycling in Bangladesh: An economic assessment." *Imo-norad sensrec Project*, London, UK 78 (2017).
- <https://businessinspection.com.bd/ship-breaking-industry-of-bangladesh/> February 14 (2023).
- https://en.banglapedia.org/index.php?title=Ship_Breaking_Industry February 18 (2023).
- The National Board of Revenue & Customs House Chattogram Annual Reports
- Sujauddin, Mohammad, Ryu Koide, Takahiro Komatsu and Mohammad Mosharrar Hossain, et al. "Characterization of ship breaking industry in Bangladesh." *J Mater Cycles Waste Manag* 17 (2015): 72-83.
- <https://unctadstat.unctad.org/shiprecycling>, UNCTAD, January 03 (2023).
- Mohammad Ali, "Bangladesh top in global ship recycling again." *The Business Standard* (2022).
- <https://recyclinginternational.com/business/ship-recycling-a-silver-lining-in-a-stormy-sky/47835/>

24. <https://www.tbsnews.net/dropped/industry/bangladesh-remains-top-shipbreaking-319333> October 22 (2021).
25. <https://today.thefinancialexpress.com.bd/trade-market?date=23-09-2022>
26. <https://stats.unctad.org/shiprecycling>, UNCTAD (2023).
27. Annual Reports, Bangladesh Ship Breakers and Recyclers Association
28. Sohel Parvez, "Shipbreaking slumps by half amid lower imports." *The Daily Star* (2022).
29. Sukanta Halder and Sifayet Ullah, "Scrap vessel imports fall to four-year low." (2023).

How to cite this article: Mohiuddin, Golam, Khandokar Akhter Hossain and Mir Tareque Ali. "Evaluation of Present Ship Recycling Scenario and Opportunity for Bangladesh." *J Environ Anal Toxicol* 13 (2023): 704.