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Hong Kong Convention, A Milepost for Ship Recycling Industry in Bangladesh: A Review

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Abstract.

Ship recycling yard is needed for sustainability in the shipping industry. Every year, a lot of vessels are headed towards the yard to be recycled. As this ship breaking industry is very prominent for the economy as well as industrial improvement of the world, it requires a thorough evaluation to ensure the sustainability of the industry be maintained for a longer term. However, the reality shows a different picture due to severe pollution lead by improper management of recycling yard all over the world. The fact is, the resources are not vanished abruptly, it changes through time. Among all, ship breaking is one of the crucial industries in Bangladesh. As a matter of fact, Bangladesh is one of the top drivers in ship recycling industries with a turnover of USD 800 million. For the past two decades, Bangladesh had thrived in the business of ship breaking and recycling, however it comes with a downside –it caused bad impacts on the environment, health hazard and increased of death toll. To overcome pollution from this industry, a new convention is introduced in Hong Kong in 2009. This convention explains about hazardous material, identification, separation process through inspection and survey. The bottom line of the convention is to create an eco-friendly and green environment for the present and future generation. Nonetheless the issue arisen is the refusal of ratification on the convention by Bangladesh. The purpose of this paper is to find the relationship of green ship recycling in Bangladesh through identifying gap between Hongkong convention and the application of convention in the context of Bangladesh.

Keywords: green ship recycling, recycling industry in Bangladesh, ship recycling method, Hong Kong convention, pollution of environment.

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1.Introduction

Bangladesh has taken its position in the global market by dismantling around 47.2% world vessel in 2019. There are more than 150 shipyards among which more than 60-70 shipyards are active throughout the year. The ship breaking industries is mostly located in **S**hitakundo, Chittagong (FIGURE 1). The geographical location of the ship breaking zone is between latitude 22°25'and 22°28'N and longitude 91°42' and 91°45'. From [1] it is known that this industry was started in 1960 by scraping a Greek ship "MD ALPINE" and most flourished in 1980s.

Bangladesh has become a leader in the industry based on several reasons. First is cheap labor and lack of applying laws. Most of the labor (40.75%) is between the ages of 18-22 years, however over 10.94% of them are child labor. Next, there is no official contract between the owner and labor, hence a very less legal ground implemented in this case. Most of the labor (46.42%) are illiterate and poor. So, for less money, they tried to hire these labors. Moreover, there is very less facilities like medical, food, accommodation provided. The labor does not have proper knowledge of the work and the safety which they often rely on blowtorch, hammer, winch and sometimes bulldozer as the tools for ship breaking. Moreover, they work without personal protective equipment (labor without PPE as the owner is not willing to pay extra money for that purpose). In addition, there are only small number of proper institutions to train the labor. In 2018, Bangladesh ship recycling act is made for the implementation of the proper safety culture and facilities, yet very few is in force. Due to the geographical advantages, the slope of sea-bed with long beach gives Bangladesh a suitable position for the ship breaking industry. The tidal effect also made a great impact in water depth in accordance to stable weather condition. [2] found the following reason as apt in choosing the location for ship recycling yard:

i. An encouraging locality for to develop a heavy industry
ii. Linked industries within a convenient distance
iii. Direct road communication with the linked industries
iv. Very less delicate area around the yard.

Moreover, high demand of steel of various industry helps the ship breaking business to flourish.

Recent study by [3] shows an outline of the placement of the world fleet, both in total numbers and in gross tonnage.

Figure 2 shows a clear picture that the industry can play a significant role in the world economy and Bangladesh can uphold the gravity of the industry with lucrative profit by standing in leading position. If the vessel is large, it will contain more amount of steel, which can be recycled later. Figure 3 establishes the market analysis of ship scraping in the past 20 years in the Indian sub-continent. From there, it proves a significant market value for the recycling industry and as of the current situation, it is in peak for the last 10 years.

2.Current scenario of industry

According to [4] ship recycling industry plays a significant role in the growing economy of Bangladesh. However, [5] suggested that ship recycling industry did not establish in a very healthy work and environmentally friendly way. Bangladesh does not have a source of iron ore to fulfill the demand of steel and iron industry. So, ship scraping industry which is located at Sitakunda, Chittagong, becomes the center of ship breaking industry. It was reported by [6] that approximately 60% of raw materials are coming from ship breaking yards for the local industries. Table 2 shows the scraped ship number, gross tonnage (GT), light displacement tonnage according to types of ship and Table 3 shows the maximum quantity of particular flag of ship scraped. From Table 4, the exhibition of demolition price of ship in the context of giant ship recycling countries, it is crystal clear that Bangladesh is in its top notch in starting of 2022.

From the latest report from IMO media center, approximately USD 20-30 million is required to modernize the ship breaking yards in Bangladesh. The owners are very reluctant for the high cost. More over in this year, the price of scrap drops to 50% due to Covid 19 situation [7]. The good news is Japan and Norway agreed upon to help Bangladesh to store green recycling specially storage of hazardous waste with an amount of $1.5 million which will start from end of 2020 and will be distributed in three phases [8]. Currently, Bangladesh is earning about USD 2.4 billion annually from around 125 ship breaking yards. To improve the system, Bangladesh government took initiative to establish ship recycling board as a one stop service. It would help to improve the situation. Furthermore, the Bangladesh Ship-breaking and Ship Recycler's Association (BSBRA) was formed to scrutinize and focus on publication matters related to ship recycling, so that the govern body will have the preparedness to tackle any deviation of standard. To govern the ship-recycling industry, [9] reported that Bangladesh has The Ship-Breaking and Ship-recycling Rules 2011 followed by ship reprocessing act 2018. The ship-recycling Industry must possess an environmental clearance certificate from the Department of the Environment in the Ministry of Forest and Environment, as a proof of its environmentally and eco-friendly management. The Ministry of Industries of Bangladesh has their intention to ratify the Hong Kong Convention by 2023. Due to the government's efforts to establish an environmentally friendly ship-recycling industry, one Yard had been awarded the Hong Kong Convention Certificate, and more will follow. However, a study by [10] which investigated occupational training in the Ship-recycling industry in Bangladesh, had come into conclusion that current occupational training in Bangladesh does not meet international standards. Therefore, a training program needs to be updated regularly to keep in pace with high demand in the world.

According to [4] the Hong Kong Convention also impose a regulation on the Inventory of Hazardous Materials, which makes it mandatory for ships to carry the related document onboard for five years after the convention enters into force and this includes ships that are going for recycling. The well documentation of the inventory of hazardous material is required by the regulation. The survey will be renewed periodically until the ship is sent for recycling. The convention also provides comprehensive information on the hazardous materials and enlists the items which is regarded as hazardous. It must be ensured not to install or use during the construction or repair of the vessel.

In most of the shipbreaking yards, basic tools and proper working guideline in the safety aspect is not available. Very less quantity of the yard has the facility to store and secure gas cylinders as oxygen and acetylene gas bottle need to be kept separately. As there is no proper segregation of ships parts and scraps, it is difficult to crawler cranes and forklift trucks to move. Workers does not have appropriate and adequate personal protective equipment (PPE) and were exposed to fumes, toxic gas, and hazardous materials; therefore, they were unguarded to accidents and sickness. The shipbreaking activities are antagonistic to the community and the environment because they are located very close to residential areas. The works are conducted on the shore, which means pollutants and hazardous waste easily glided into the sea as normally no procedure has been followed. Even most of the scrap yard does not use oil boom to prevent any pollution.

According to [11], ship recycling facilities should be capable to conduct recycling activities and complied to the national law as well as international conventions. The facilities must be observed by a competent national administration in accordance with regulation developed by international labour Organization (ILO) on the Guidelines on "Safety and Health in The Processes of Ship-breaking and Basel Convention".

Recent study by ([12]) shows how material flow analysis tool can reduce cost effectiveness and optimize the productivity of yard business. Shipowner must check and choose the recycling facilities about the process of scraping the ship, waste management, storage of recyclable items and hazardous material. The scape yard should keep in mind that there should be no chance of pollution during or completion of scarping the ship. Design of recycle yard by [13] gives a particular idea on the way to dismantle a ship in a convenient and effective way. It emphasizes on knowledge of manual, machineries, lifting device, effective scantling and so on. After that the facilities that should be available in the recycling yard among other things are:

a. Container - Container has to have a standardized size to use

b. Storage Tank - Storage tank which is used to store liquid, waste storage tank should be in good condition, covered, and permanently in shed. The storage tank can only be used for the constraint of waste that compatible to its construction material.

c. Drainage - there are two types of drainage, i.e.:

i. Detention type: for temporary detaining water, and then flow it to a storage pool in order to maintain the balance of water.
ii. Retention type: water is retained and store temporarily on the surface while give time for the water to be absorbed to the soil naturally.

3.Recycling method and recycled items

The ship contains not only various recyclable materials but also a range of hazardous and toxic substances[14]. [15] shows a proper guideline to identify, isolate and label the items which is enlisted in the convention. According to [11]The phases of dismantling processes are usually carried out as follows:

a. ***Ship Arrival***: Ship is towed and pulled to the scrapping berth,
b. ***Understand and identifying***: identify and analyses the ship condition,
c. ***Removing***: all liquid materials and ship outfits are removed from the ship before the scrapping phase is started,
d. ***Dismantling and Metal Cutting***: non-metal parts of the ship are dismantled at first. Then the metal parts and structure are cut using oxy acetylene flame cutting tools, the work can be divided into primary cutting and secondary cutting.
e. ***Separation of Scraps:*** the scraps are sorted out and the separation of harmful material from potentially recycle or reused materials. The hazardous materials are then temporarily stored waiting to be relinquished later.

The process can be illustrated as shown in Figure 4:

[16] finds the same factor which is related to sustainable development for the key economic activity. [17] identifies the green ship recycling process involves with few factors such as management, dismantling equipment, disposal of hazardous material, water and energy consumption for cutting process and handling the hazardous materials, environmental protection facilities and plans, and so on. In this study, the organization and management (OM) factor refers to the organizational rules and regulations, on-site management, audit procedure, and so on; the disposal of hazardous materials (DHM) factor refers to the disposal of asbestos, polychlorinated biphenyls (PCBs), glass fiber, solid waste, ballast water and oil, and so on; the ship recycling technology and equipment (SRTE) factor refers to the use of ship recycling technology, equipment, and so on; the resource and energy consumption (REC) factor refers to the consumption of water, power, and clean energy, and so on; the ecological index (ECI) factor refers to the pollutants (rubbishes, noise, heavy metals, etc.) generated during ship recycling activities which will be harmful to the ecological environment; the environmental protection facilities and plans (EPFP) factor refers to the environmental monitoring system, the anti-pollution facilities, and risk prevention plans, and so on.

Now to particulate the each and every factor, the very first step of dismantling of process is cutting the ship into pieces. Two popular method of cutting are oxyfuel cutting and plasma cutting. Among these two methods, plasma cutting is much enviro-friendly than oxy-fuel according to [18]. As the yard owner is not willing to sacrifice unethical profit, so the condition remains unchanged. From [19], the Norwegian Shipowners' Association (NSA) has expressed the interest to improve the ship recycling process in Bangladesh. So, if that happens, the demolition will improve and the ship recycling process will become more efficient. During the cutting process, there is high risk of air pollution due to fly dust. So, it was found by [20]that the flying ash can be contained by water spray, later which can be filtered before putting this wash water to storage pool. For the asbestos dust, facility requires enclosed space, water spray and PPE to prevent asbestos dust spreading into air found by [21]. A cold mechanical way shall be used during removing the solid PCBs. The process for dealing with glass fiber is similar to asbestos. The dismantling area will be kept wet

to prevent floating dust. Different kinds of hazardous materials must be treated properly during ship dismantling activities to avoid HSE (health, safety and environment) issues, which requires different technologies and equipment. Around 70% of the workers were involved in cutting and scrapping of plates and painted metals in Alang ship recycling yards in India which is reported by [22]. During dismantling process these workers are directly and indirectly affected by the pollution. Most of the recycling yards does not have proper medical support also.

A study is conducted on the livelihood and occupational health hazard by [23]. Over there it is found workers are usually less concerned and aware with the development programs by private and public organizations because they belong as a vulnerable part of society. A very good study was conducted by [24] where it showed 12.2% of accident occurs in relation with noise pollution and the worker in the site experienced (>85dB(A)) level of noise.

According to [25] there is one side effect arises due to Hong Kong convention, where the developed countries try to send the ships to its graveyard in south Asia. As the on growing market of steel and less supervision alongside with less labor cost, it paves the way to the adverse effect on environment. In particular, raw materials from scrap yard provide 60% and 25% of steel resources for Bangladesh and Pakistan respectively. Also, non-standard ship breaking yards are more inclined to offer high prices to buy EOL ships. Bangladesh, India, and Pakistan pay "380–420 USD/light displacement Tonnage (LDT) for EOL ships, whereas the value is approximately 200 USD/LDT in Turkey and China and about 130 USD/LDT in Europe", respectively. If the shipbreaking industry in South Asia maintains the status quo, more pollutants will be liberated into air, sea, and soil, thus leading to ecological destruction. Moreover [26] found significantly higher ($p < 0.001$) levels of the urinary Cd, Mo, Co, V, Sb, and Tl, were observed in the people who live in nearby to ship wreck yard or occupationally involved in.

The adverse effect of the scrap yard or the process of ship dismantling is so high that [27] found in one survey that working one day in the ship breaking yards is equal to smoking 10-15 packs of cigarettes. Alongside with accident, pollution and unfavorable working condition due to hazardous material, causes the severe diseases. To face the accident/ diseases, most of the facilities does not have proper medical facilities or competent persons. So, it takes time to take one injured worker to nearby medical institution. In this time delay, things get more serious or even death.

In the terms of death, in Bangladesh the following Table 5 is a figure of death and injury from 2010-2019

Recent study [28] found behavior-based safety attributes most work-related accidents to the unsafe actions of employees. It is designed to change safety-related behaviors directly through the application of behavioral principles and multiple strategies. Though it has some drawbacks, but still, it can make the situation better.

4.Aspiration made under Hong Kong convention

Total no of 27 IMO conventions (Table 6) are now into the force in Bangladesh where Hong Kong convention is not one of them. According to [29] The international legislation in ship-breaking mainly comprises of the Basel Convention, 1989 and the Hong Kong Convention, 2009.The ILO also bestowed to resolving issues adjacent unsustainable ship-breaking by releasing guidelines of a specific nature, titled "Safety and Health in Shipbreaking: Guidelines for Asian countries and Turkey" (ILO; Anonymous 2004) in 2004. The Hong Kong Convention has not entered into force yet. "The Convention will enter into force 2 years after 15 States "representing 40 per cent of world merchant shipping by gross tonnage, and combined maximum annual ship recycling volume not less than 3 per cent of their combined tonnage" (IMO, n.d.) have ratified it". It is a comprehensive and effective guideline, which addresses most of the issues regarding to ship breaking, by providing a wide range of legal provisions, covering from the design of operation of a ship to its recycling plan. Since 2003, the IMO has adopted the Guidelines and Circulars for the purpose of achieving a green ship-recycling industry [30]. Currently, there are seventeen countries (Table 1) who are the contracting states of the convention where the total world tonnage is 29.77%[31]. Among India, Bangladesh, Pakistan, China, and Turkey, which are the major ship recycling countries in the world, only Turkey had ratified the convention on 31 January, 2019 and Spain has accessioned on 3 June, 2021[32]. With the help of the convention, ship recycling industry can enter in "green industry" as it will reduce the emission of carbon di oxide and other harmful substances.

Ship scraping is declared officially as an industry in 2006 in Bangladesh, even though Bangladesh has been one of the top-three ships-dismantlers in the world. Easy profit with negligible monitoring becomes one of the many reasons for under-regulated ship-recycling practices in Bangladesh. The NGO Shipbreaking Platform has investigated and reported close to 13 cases of fatality and serious injury in the Chittagong ship recycling yards in the first three quarters of 2021 alone. The regulatory framework for ship-breaking industry in Bangladesh is extremely focused on enhancing the efficiency through codification including the all-circumscribing Environment Conservation Act, 1995, Ship-breaking and Recycling Rules, 2011 and ship processing act 2018. It is been noted that the judiciary in Bangladesh has also given assertions from time to time in the matters pertaining to entry of vessels (BELA v. Bangladesh, Writ Petition No. 3916/ 2006), "compensation to injured persons (BELA vs. Bangladesh and others (MT Enterprise case), Written Petition No. 7260 of 2008)", and for compliance with the national legislation (Writ Petition No. 2911/2003).The Bangladeshi Parliament recently passed the Bangladesh Ship Recycling Bill, 2018, which provides for stringent punishments for violations such as establishment of a yard without permission, and lists duties of shipyard owners (Safety4sea 2018).The disposal of ships at end of their economic life has great significance for the continual renewal of the merchant marine fleet [33] and for sustainable development [34].

According to Hongkong convention [35], following Table 7 & 8 are the gist of convention

The convention emphasizes in the preparation of ship and the scrap yard before breaking the ship into pieces. But it is also important to have a close look on the recycling facilities which is already established or in progress. For that reason, [36] has given an adequate guideline to establish authorization of green friendly ship recycling yard. Document of authorization to conduct ship recycling (DASR) is the key component which includes all guidelines for the process. It has proper authorization of suspension or if any yard failed to comply during the inspection.

[37] has given the guidelines for ship recycling facility plan (SRFP) facility management, vessel arrival management, ship recycling methodology, details of competent person, training programme, permits to safe entry and hot work, management of hazardous materials, certification and so on. The inspection method is covered by [38] where survey and certification are guided by [39]

5.Challenges to implementing Hong Kong convention in Bangladesh

This study tried to find what are the challenges for implementing the Hongkong convention. First, the study would like to focus on the three pre-conditions of the convention. The first requirement is to sign by at least 15 or more-member states which is an easy step. As if the first requirement is fulfilled, the second condition will be managed as it states at least 40% or more of the gross tonnage of the global merchant shipping volume. Here comes the third requirement which "the combined maximum annual ship-recycling volume of the States that have already signed the Convention should constitute at least 3% or more of the gross tonnage of the combined merchant shipping of the same States during the preceding 10 years". But it depends upon the signature of the five main ship recycling States, including Bangladesh, China, India, Pakistan and Turkey. Among these States, the only OECD Member State is Turkey. So, as Bangladesh India and Pakistan did not sign, it poses a problem for the convention to implement effectively.

Now there are few other points which put the convention in question for effectiveness.

i. As lack of global ship registration system, it is unclear the future of the effectiveness of the convention in sense of survey, inspection and reporting,
ii. The convention mainly focusses on the pre-scraping period. But it does not show a clear and proper way how to dispose or handle the waste material or hazardous substances after segregation from scraped ship,
iii. Moreover, it is applicable to the ship of 500GT or more. So, scraping of small ship can also cause environmental and physical effect if it is not considered,
iv. Infra-structure of the yard is a major point to deal with. It requires proper management and authority to run,

v. Knowledge and training of the worker, the eligibility of the trainer and the training institute plays a vital role for the proper and effective result of this industry,
vi. Safety management and medical-care has to be ensured to prevent injury and loss of life,
vii. National policy and the policy maker should ensure the proper implement of the regulation,
viii. Stakeholder and society have to understand the future of the industry so that they can come forward to better investment,
ix. Environment has to be protected at any cost. So, when all the above parameters will be effective, then it will be possible to have and maintain a better environment.

Now in terms of law, Bangladesh ship reprocessing act has been passed in 2018 in follow up with the ship breaking and recycling rules- 2011 which was adopted on 2011. Though the act-2018 is a landmark legislation for Bangladesh but still it has several limitations. It is criticized by [40] that the act does not cover the marine and ground pollution properly. The act does not reflect the standard of training of workers and the training institute. Moreover, wage bond, social welfare, provident fund is not focused in the act.

6.Recommendation

Upon the study, it is clear that we need to put our feet together to flourish the industry. To achieve that, few recommendations can be made:

i. A government medical officer can be appointed to check the physical fitness of the worker. To ensure, whoever the worker is working, he/she is physically fit for day to day duty. This is also mitigating the employment of child labor.
ii. The training institute can appoint firefighting instructor or an experienced marine engineer to conduct the safety courses. As the marine engineers are highly trained for the safety of human body and they know the proper use of the tools, so they can educate the worker in the best effective way.
iii. Continuous monitoring by the authorized person is to be ensured, so that the proper management of worker and the work is achieved in the most practical way
iv. The yard owner can introduce reward/bonus system to the group of workers who can maintain good safety practice. This kind of numeration will boost up the energy of the worker which eventually paves the goodwill of the yard owner.
v. Financial organization can provide easy financial support to the yard owner and a transparent scrutiny to maintain the proper cash flow.

7.Conclusion

Each and every law and order is very delicate when it comes to imply. There must be some barriers to establish. But it is not impossible with an innovative mind and a wide range of eye. As long as the stakeholders understand the gravity of the ship recycling industry in alongside with clean environment, the financial support will be prominent. When there is financial support, then with proper management the rest of the parts of this industry can be bond together. Once the working people will be aware of the risk, right and obligation, then the prosperity will come within. Hence, a green future for Bangladesh. The fulfilment of Hong Kong Convention is a vital for ship recycling in Bangladesh to uplift the competitiveness of the industry in near future and remain valid in this industry.

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Figure 3	Average Indian Sub Continent scrap price of Bulkers, Tankers and Containers, last 20 years
Figure 4	The Process of Recycling Method

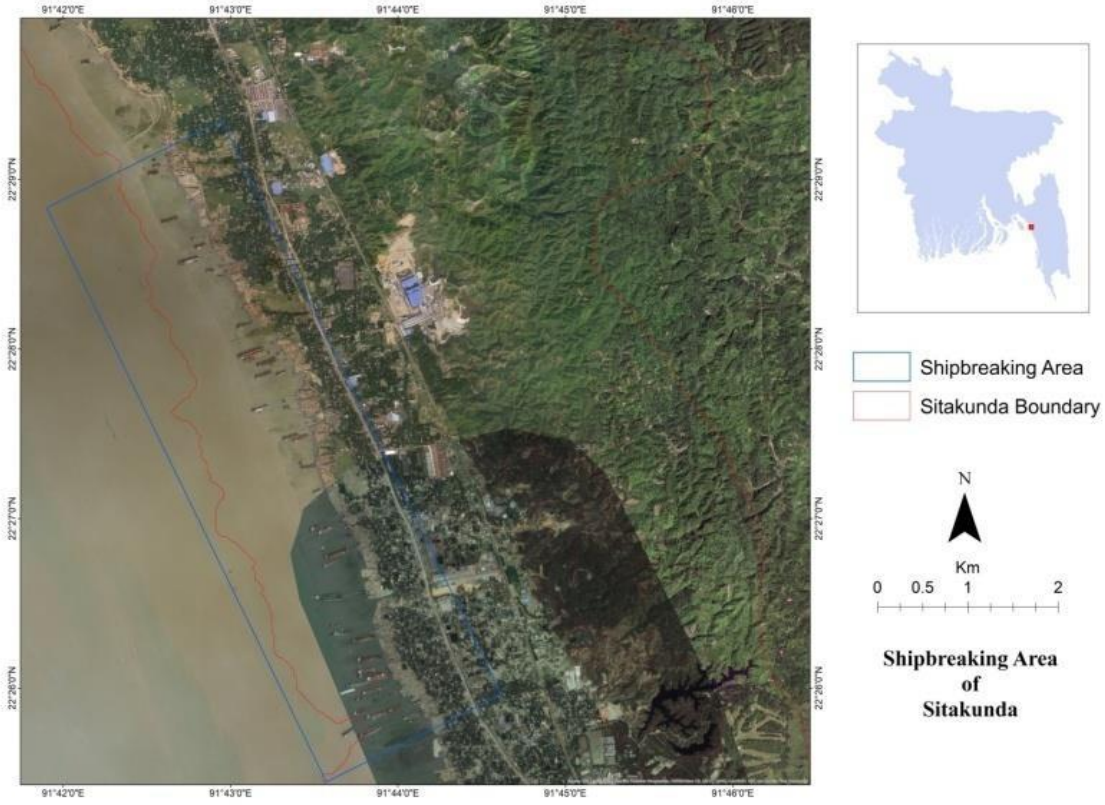
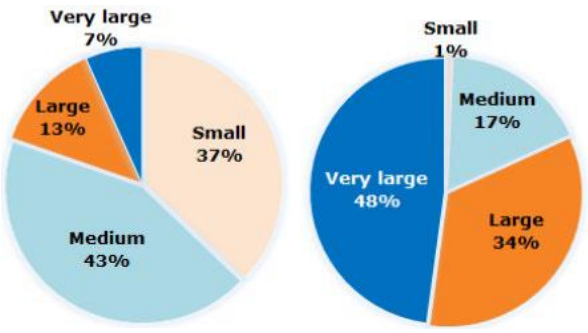


FIGURE 1. Location of ship recycling yard in Bangladesh[6]



(a) **(b)**

FIGURE 2. Distribution of the world fleet; a) world fleet: total number of ships, by size; b) world fleet: gross tonnage[41]

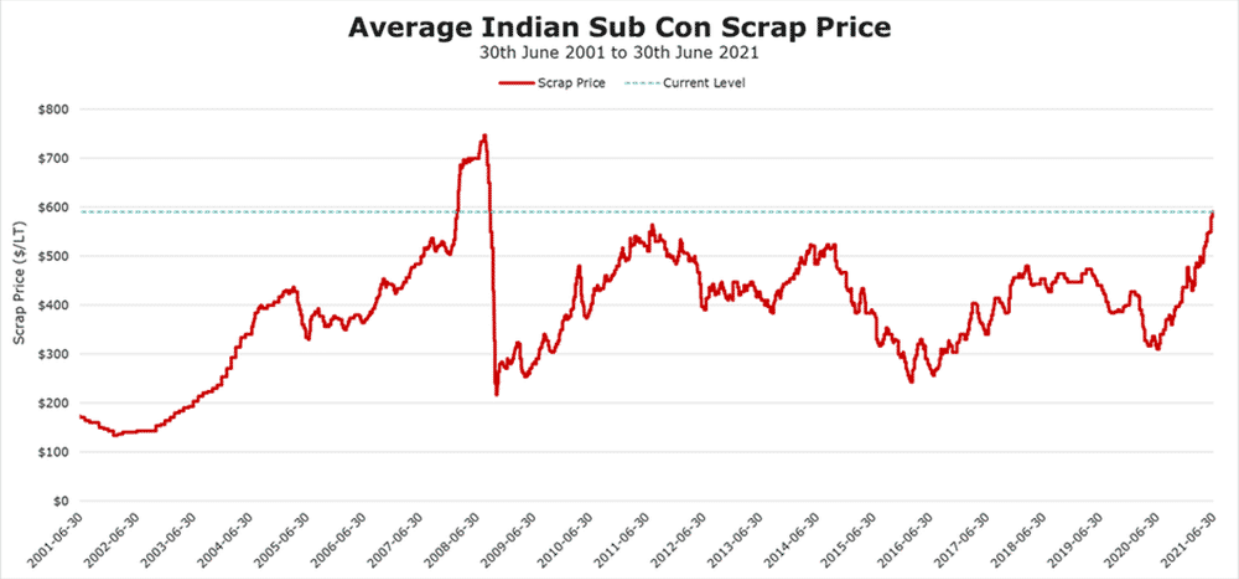


FIGURE 3: Average Indian Sub-Continent scrap price of Bulkers, Tankers and Containers, last 20 years

Data source: Data source: https://www.marineinsight.com /VesselValues January 2022

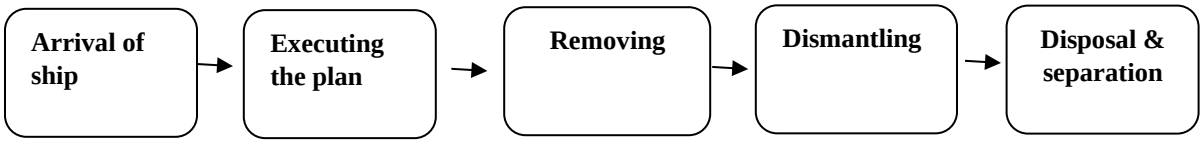


FIGURE 4. The Process of Recycling Method

List of tables

Table 1: The list of contracting countries: Ratification of Treaties/Hong Kong Convention: International Conference on the Safe and Environmentally Sound Recycling of Ships

No.	Contracting State/Territory	Ratification type
1	Kingdom of Belgium	Accession
2	Republic of the Congo	Accession
3	Republic of Croatia	Accession
4	Kingdom of Denmark	Accession
5	Republic of Estonia	Accession
6	French Republic	Ratification
7	Federal Republic of Germany	Accession
8	Republic of Ghana	Accession
9	Republic of India	Accession
10	Japan	Accession
11	Republic of Malta	Accession
12	Kingdom of the Netherlands	Acceptance
13	Kingdom of Norway	Accession
14	Republic of Panama	Accession
15	Republic of Serbia	Accession
16	Kingdom of Spain	Accession
17	Republic of Turkey	Ratification

Data source: https://gisis.imo.org/Public/ST/Ratification

Table 2: Scraped Ship Number, Gross Tonnage (GT), and Light Displacement Tonnage According to Types of Ship

Year	Type of ship	No of this type	GT	LDT
2021	Bulk/ general cargo	55	25,01,733	734,342
	Tanker/ LPG-LNG	138	4,827,617	1,534,204
	Container	9	142,906	58,956
	Others	45	325,707	215,536
2020	Bulk/ general cargo	53	2179488	607565
	Tanker/ LPG-LNG	35	963801	317863
	Container	11	140212	67071
	Others	27	392590	137723
2019	Bulk/ general cargo	77	3828441	126590
	Tanker/ LPG-LNG	65	2216959	702718
	Container	30	805100	334026
	Others	30	454391	178574
2018	Bulk/ general cargo	38	994,592	294148
	Tanker/ LPG-LNG	98	6307824	1829098
	Container	23	380,111	171223
	Others	25	240,523	96981
2017	Bulk/ general cargo	57	1640309	Not available data
	Tanker/ LPG-LNG	65	3152924	Not available data
	Container	9	156734	Not available data
	Others	29	310938	Not available data
2016	Bulk/ general cargo	144	6437149	Not available data
	Tanker/ LPG-LNG	8	292204	Not available data
	Container	157	2476333	Not available data
	Others	13	348244	Not available data
2015	Bulk/ general cargo	124	5073253	Not available data
	Tanker/ LPG-LNG	23	801691	Not available data
	Container	23	565467	Not available data
	Others	28	334539	Not available data

Data source: NGO Shipbreaking Platform. (*https://shipbreakingplatform.org)*

Table 3: Maximum Quantity of Particular Flag of Ship Scraped in Bangladesh

Year	Total no of ship	Flag						
		Panama	Comoros	Liberia	Niue	Palau	St Kitts &Nevis	Others
2021	247	41	26	11	7	15	26	126
2020	126	22	10	16	1	9	14	54
2019	202	28	38	5	8	71	17	35
2018	184	19	34	9	7	48	12	55
2017	160	19	34	24	7	21	22	33
2016	322	58	22	26	3	11	20	182
2015	198	36	13	19	21	31	23	55
2013	193	46	11	20	2	5	21	88

Data source: NGO Shipbreaking Platform. (*https://shipbreakingplatform.org)*

Table 4: Demolition prices on the month of January, 2022

Country	Demolition prices	
	General cargo (USD/LT LDT)	Tanker (USD/LT LDT)
India	570	580
Bangladesh	595	605
Pakistan	585	600
Turkey	320	330

Data source: [42]

Table 5: Number of death and injury from 2010-2019

Year	Death	Injury
2010	12	24
2011	15	No data available
2012	15	No data available
2013	20	No data available
2014	19	15
2015	14	12
2016	29	20
2017	15	22
2018	12	8
2019	13	25

Data source: NGO Shipbreaking Platform. (https://shipbreakingplatform.org)

Table 6: List of ratification of treaties by Bangladesh

No.	Treaty	Ratification Type	Date Of Treaty Entry Into Force	Date Of Entry Into Force In Country
1	IMO CONVENTION	Acceptance	17/3/1958	27/5/1976
2	IMO AMEND-91	Acceptance	7/12/2008	7/12/2008
3	IMO AMEND-93	Acceptance	7/11/2002	7/11/2002
4	AFS 2001	Accession	17/9/2008	7/9/2018
5	BWM 2004	Accession	8/9/2017	7/9/2018
6	COLREG 1972	Accession	15/7/1977	10/5/1978
7	FAL 1965	Accession	5/3/1967	20/11/2000
8	IMSO C 1976	Accession	16/7/1979	17/9/1993
9	INMARSAT OA 1976	Signature	16/7/1979	17/9/1993
10	INTERVENTION 1969	Accession	6/5/1975	4/2/1982
11	LL 1966	Accession	21/7/1968	10/8/1978
12	LL PROT 1988	Accession	3/2/2000	18/3/2003
13	MARPOL 1973/1978	Accession	2/10/1983	18/3/2003
14	MARPOL ANNEX III	Acceptance	1/7/1992	18/3/2003
15	MARPOL ANNEX IV	Acceptance	27/9/2003	27/9/2003
16	MARPOL ANNEX V	Acceptance	31/12/1988	18/3/2003
17	MARPOL PROT 1997	Accession	19/5/2005	19/5/2005
18	OPRC 1990	Accession	13/5/1995	23/10/2004
19	SAR 1979	Accession	22/6/1985	7/9/2011
20	SOLAS 1974	Accession	25/5/1980	6/2/1982
21	SOLAS PROT 1988	Accession	3/2/2000	18/3/2003
22	STCW 1978	Accession	28/4/1984	28/4/1984
23	STP 1971	Accession	2/1/1974	10/11/1978
24	SPACE STP 1973	Accession	2/6/1977	10/2/1979
25	SUA 1988	Accession	1/3/1992	7/9/2005
26	SUA PROT 1988	Accession	1/3/1992	7/9/2005
27	TONNAGE 1969	Accession	18/7/1982	18/7/1982

Data source: https://gisis.imo.org/Public/ST/Ratification

Table 7: The Gist of Hong Kong Convention

Chapters	Regulation	Headline of Regulation	Correlation Between Regulation and appendix	Remarks
Chapter 1	**Regulation 1**	Definition		
	Regulation 2	General applicability		General provisions
	Regulation 3	Relationship with other standards, recommendations and guidance		
Chapter 2	**Regulation 4**	Controls of ships Hazardous Materials	Regulation 4 and appendix 1	
	Regulation 5	Inventory of Hazardous Materials	Regulation 5 and appendix 1,2,3 &4	
	Regulation 6	Procedure for proposing amendments to Appendices 1 and 2		
	Regulation 7	Technical groups		
	Regulation 8	General requirements (Preparation for Ship Recycling)		
	Regulation 9	Ship recycling plan	Regulation 9 and appendix 4	Requirement for ships
	Regulation 10	Surveys	Regulation 10 and appendix 4	
	Regulation 11	Issuance and endorsement of certificates		
	Regulation 12	Issuance or endorsement of a certificate by another Party		
	Regulation 13	Form of the certificates		
	Regulation 14	Duration and validity of the certificates		
Chapter 3	**Regulation 15**	Controls on Ship Recycling Facilities (requirements for ship recycling facilities)	Regulation 15 and appendix 5	
	Regulation 16	Authorization of Ship Recycling Facilities	Regulation 16 and appendix 5	
	Regulation 17	General requirements		
	Regulation 18	Ship recycling facility plan		Requirement for ship recycling facilities
	Regulation 19	Prevention of adverse effects to human health and the environment		
	Regulation 20	Safe and environmentally sound management of Hazardous Materials		
	Regulation 21	Emergency preparedness and response		
	Regulation 22	Worker safety and training		
	Regulation 23	Reporting on incidents, accidents, occupational diseases and chronic effects		
Chapter 4	**Regulation 24**	Initial notification and reporting requirements	Regulation 24 and appendix 6	Reporting requirement
	Regulation 25	Reporting upon completion	Regulation 25 and appendix 7	

Table 8: Appendix of Hong Kong Convention

Appendix	Headline of Appendix
Appendix 1	Controls of hazardous materials
Appendix 2	Minimum list of items for the inventory of hazardous materials
Appendix 3	Form of the international certificate on inventory of Hazardous materials
Appendix 4	Form of the international ready for recycling certificate
Appendix 5	Form of the authorization of ship recycling facilities
Appendix 6	Form of report of planned start of ship recycling
Appendix 7	Form of the statement of completion of ship recycling