

# Study on Present Scenario of Bangladesh Ship Building Industries, Underlying Problems and Probable Solution

Mohammad T. Saki, Md. Nesar Ali, and Mohammad A. Martuza

**Abstract**—We are living in a competitive world. To develop economic condition of any country, industrial sector plays a major role. There are so many industries in our country in our country. Among these sector ship building is an important activity in context of Bangladesh. Ship building industries have been located along the coastal belt and riverbanks of Bangladesh. Ship building industry generates large amount of revenues for the country. The sea borne cargo growth is increasing 6-8% per year and demand of new ship building is increasing at the rate of 3-4% per year. Considering the world market and internal market, it is assumed that Bangladesh has a bright future to elevate herself as a ship building nations in the world market and surely that factor should encourage more Bangladeshi entrepreneurs to come forward in this business. Experts say more than 55% of the world's ship are more than 20 years old and need replacing. Globally, this small and medium sized ship market is worth around \$400 billion. If Bangladesh can get 1% of this market, then it amounts to \$4 billion. Our research deals with the last few condition of ship building industry in Bangladesh. We also discuss about the condition of worker and environmental pollution & underlying problems of shipbuilding in Bangladesh. Finally, we formulating some suggestion which can be taken by the government and the private sector to improve the condition of ship building industry and creating demand for our ships in the world market.

**Index Terms**—Ship Building, Coastal Belt, Global Economic Recovery, Entrepreneurship.

## I. INTRODUCTION

Bangladesh is a small and densely populated country with an area of about 147,610 square kilometers. It has a long coastal belt of about 710km which is enriched with natural resources specially fish and other aquatic species of different varieties. It has another promising opportunity with the shipping industry which includes ship building and ship recycling industries. Among the two different sectors ship recycling industry has been going on for a quite long time in our country. But ship building industries is relatively new to our country. But it has far a widening impact in our country. As Bangladesh is a riverine country which stands in the Bay of Bangle with a mammoth sea area of 185,756 square km, abundance with living and non-living resources. There are more than 200 rivers with a total length of about 22,155km, which occupy about 11% of total area of the country. Here rivers and water transports play a vital role for economy and

commercial activities in Bangladesh. Major export and import of Bangladesh about 85% is also traveled by sea. At present more than 5000 inland/coastal ships have been playing all over the country, which carry more than 1,00,000 skilled workers and 1,50,000 semi-skilled workers are employed in this labor intensive industry. If we talk about the raw materials for this sector we have got one of the biggest ship breaking industries in the world. They are the prime source of raw material including plate, frame, stiffener, longitudinal, pipe, old engine/generator, and even auxiliary machinery, for most of the local private shipbuilding yards. Those are used as raw material in manufacturing and repairing inland shipping fleet. The backward linkage industry can help us attaining the top most position in the ship building industry. If we can keep up with the present scenario of the ship building industry in the world and improve its condition in our country so as to facilitate the growing demand for new ships to be built, we can easily achieve revenue worth billion dollars [1].

## II. LITERATURE REVIEW

The first known vessels date back to the, about 10,000years ago, but could not be described as ships. The first navigators began to use animal skin or woven fabrics as sails. Affixed to the top of a pole set upright in a boat, these sails gave early ships range. This allowed man to explore widely, allowing for the settlement for Oceania for example (about 3000 years ago). The rich history of Bangladesh in shipbuilding dates back to a long ago. Due to congenial geographic location of this part of sub-continent, people living here used to craft wooden boat for commuting and transporting goods. However only over a period of 40 years after independence, Bangladesh has developed a large fleet of about 20,000 vessels comprised of inland & coastal commercial vessels, and various types of working and fishing craft. There are indigenous shipyards, more than 200 in numbers(fig.-1) building and repairing these vessels and in turn have provided a strong prepared base for building ships of international standards. In 1979, the sector received its first foreign investment after the independence of Bangladesh when Mitsui Engineering and Shipbuilding industry, a Japanese enterprise, formed a Joint venture with High speed Shipyard of Bangladesh to establish a shipyard at Fatullah, Narayanganj. By the 2000s, several more private shipyards were established and in 2008, Bangladesh became a ship exporting country. Shipbuilding reviewed again when a number of local entrepreneurs of Bangladesh brought name and fame for the country by developing potential in shipbuilding by handing over some ocean- going vessels to overseas buyers from Denmark, Finland and Mozambique.

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M. T. Saki was with Bangladesh Institute of Marine Technology (e-mail: bimt.saki@gmail.com)

M. N. Ali was with Chittagong University of Engineering & Technology (e-mail: nesarali455@gmail.com)

M. A. Martuza was with Chittagong University of Engineering & Technology (e-mail: martuzacuet.me11@gmail.com)

Bangladeshi shipbuilder also handed over few ice-class vessels to a German company and more vessels are going to be delivered by the next few years. Thus shipbuilding in Bangladesh is marching forward in a way to securing a firm position in the world market and at the same time, the country is returning slowly to its past tradition of building ships for foreign countries. Some local leading shipyards like Ananda and western Marine are now engaged in building over 40 small to medium category vessels worth about 0.6 billion US dollar, mainly for European buyers [2].

### III. SHIP BUILDING INDUSTRY

The main objectives of our project work can be subdivided into five major parts. They are firstly, to study about present scenario of ship building industry in Bangladesh. Secondly, to know about last few years' condition of ship building industry in Bangladesh. Then, to know about the condition of worker and environmental pollution. Then, underlying problems of shipbuilding in Bangladesh. Finally, to formulate some suggestion which can be taken by the government and the private sector to improve the condition of ship building industry and creating demand for our ships in the world market.

### IV. SHIP

A ship is a large buoyant watercraft. Ships are generally distinguished from boat based on size, shape and cargo or passenger capacity. Ships are used on lakes, seas, and rivers for a variety of activities, such as the transport of people or goods, fishing, entertainment, public safety and warfare. Historically, a ship was a sailing vessel with at least three square rigged masts and a full bowsprit. Ships and boats have developed alongside humanity. In armed conflict and in daily life they have become an integral part of modern commercial and military systems. Fishing boats are used for millions of fisherman throughout world. Military forces operate vessels for combat and to transport and support forces ashore. Commercial vessels, nearly 35,000 in number, carried 7.4 billion tons of cargo in 2007. As of 2011, there are about 104304 ships with IMO numbers in the world [3].

#### A. Nomenclature

Ships can usually be distinguished from boats based on size and the ships ability to operate independently for extended periods. A commonly used rule of thumb is that if one vessel can carry another, the larger of the two is ships. Dinghies are carried on sailing yachts as small as 35 feet, clearly not ships; this rule of thumb is not foolproof. In the age of sail, a ship was sailing vessel with at least three square rigged masts and a full bowsprit; other type of large vessels which are traditionally called boats are the Great Lakes freighter, the river boat, and the ferryboat. Though large enough to carry their own boats and heavy CARGOS, these vessels are designed for operation on inland or protected coastal water. In most maritime tradition ships have individual names, and modern ships may belong to ship class often named after its first ship.

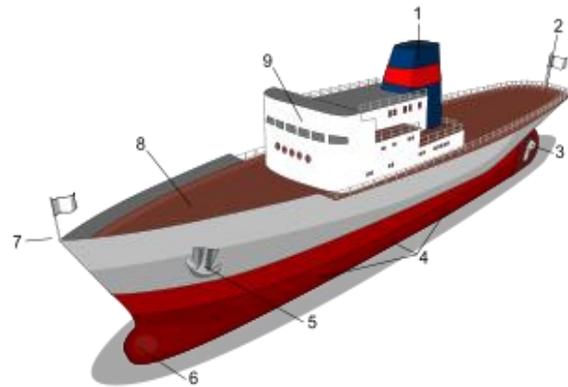


Fig .1. Nomenclature of a Ship

1) Smokestack or funnel, 2) Stern, 3) Propeller and rudder, 4) Portside (the right side is known as starboard), 5) Anchor, 6) Bulbous bow, 7) Bow, 8) Deck and 9) Superstructure.

### V. TYPES OF SHIPS

There are major eleven types of ship. They are 1) Warships (includes: Submarines, Air craft carriers, Cruisers, Frigates, Torpedo boats, offshore petrol vessels), 2) Bale and unit cargo (includes: Container vessels, Heavy cargo vessels, Multipurpose vessels and Cattle ship), 3) Refrigerated Cargo (includes: LPG/LNG carrier, Conventional refrigerated ships, Fishing vessels), 4) Bulk Cargo (includes: Crude carrier, Product tankers, Chemical tankers and Bulk carriers), 5) Roll-on/Roll-off(includes: Ro-Ro freighters and Car and passengers ferries), 6) Receptions (includes: Cruise Ships and Sailing/Motor yachts), 7) Fishing Vessels (includes: Fishing vessels, Other type fishing vessels), 8) Vessels providing services for shipping (includes: Seagoing tugs, Harbor tugs, Icebreakers, Pilot vessels, Coast guard vessels and Research vessels), 9) Salvage (includes: Tugs, Shear legs, Diving vessels, Barges), 10) Construction and infrastructure (includes: Dredgers, Cable layers, Shear legs) and 11) Miscellaneous types (includes: Seismic survey vessels, Drilling rigs/jack-ups, Drilling ships, Semi-submersible drilling units, Floating (production) storage and offloading vessels, Shuttle tankers, Supply vessels and Construction vessels) [4].

### VI. SHIP BUILDING INDUSTRY

The prime function of the ship building industry is to supply ship, ocean vehicles and offshore structures to the shipping and marine industries for use in transportation and in other specialist tasks such as the exploration of ocean resources. It should be under stood that ship building is an international business, involving the national governments of the various countries, and is intensively competitive. Ship building is the construction of ships and floating vessels. It normally takes place in a specialized facility known as a shipyard. The success of a particular shipyard or shipbuilding industry is often measured its ability to build the right type of ships at the right time and at the right place. Shortcoming in any of these three closely related factors can induce immense difficulties and even failure into the activities of the organization or industry [5].

#### A. Present Day Shipbuilding

China is an emerging shipbuilder that overtook South

Korea during the 2008-2010 global financial crisis as they won new orders for medium and small-sized container ships. China is now firmly the World's largest shipbuilder with 45% of all the world's total order's, and its quality and technology have improved very much. Today, South Korea is the world's second largest shipbuilding country with a global market share of 30% in 2012 [6]. South Korea leads in the production of large vessels such as cruise liner's super tankers, LNG carriers. Drill ships, and large container ships. In the 3<sup>rd</sup> quarter of 2011, South Korea won all 18 orders for LNG carriers, 3 out of 5 drill ships and 5 out of 7 large container ships. South Korea's shipyard's are highly efficient, with the world's largest shipyard in Ulsan operated by Hyundai heavy industries, Samsung heavy industries, and Daewoo Shipbuilding & Marine Engineering, dominate global shipbuilding, with STX shipbuilding, Hyundai Samho Heavy industries, Hanjin Heavy Industries, and Sungdong Shipbuilding & Marine Engineering also ranking among the top ten shipbuilders in the world [7].

#### B. List of Shipbuilding Industry around the World

Following countries are playing a major role in the ship building industry at present. They are: China, South Korea, Japan, Belgium, Denmark, France, Germany, Grece, Italy, Netherlands, UK, Finland, Norway, Sweden, Spain, Portugal, Brazil, Singapore, Taiwan, USA, Croatia, India, Philippines, Romania, Turkey, Vietnam and Bangladesh [7].

### VII. SHIP BUILDING AND BANGLADESH

In 2009 Mr. Khairul Hasan a student of Kyushu University of Japan wrote a report entitled "Important Consideration & Contribution of Flourishing SHIPBUILDING Industries in BANGLADESH". In that report he mentioned different aspects of ship building industries in Bangladesh. He mentioned some drawbacks for this industry to become a flourished one. He also described some major causes for industry to be so unprepared for the growing demand of ships in the world market. In our institution, "CHITTAGONG UNIVERSITY OF ENGINEERING AND TECHNOLOGY (CUET)" Parkan Chowdhury presented a project paper entitled, "PRESENT SCENARIO OF SHIP INDUSTRIES AND ITS ECONOMIC ASPECTS IN BANGLADESH" in 2009. In the project he showed different aspects of ship industries in our country as a whole and presented the contribution it is making in our country. In 2010 Dr. Abdullah Bari presented a keynote paper in the International conference on marine technology entitled, "Potential, PRIORITIES AND PROSPECTS OF SHIPBUILDING IN BANGLADESH". The volume of shipbuilding swelled extensively during the Mughal period. Even in the 17th century, the entire fleet of ships of the Sultan of Turkey was built at Chittagong. Also in 1805, the British Navy built ships at Chittagong for the famous battle of Trafalgar. However, with the passage of time, the glory of shipbuilding in this region began to fade. In this paper he included the workforce, geophysical conditions, infrastructures, linkage industries and some detailed discussion regarding government policy on ship building industry. In 2010, at MARTEC 2010 N.M GolamZakaria, M.M Rahaman, Akhter Hossain presented a paper entitled "Study on some competitive parameters for Shipbuilding

industry in Bangladesh". This paper focuses on studying some crucial competitive factors like labor skill, labor availability, labor man-hour, labor cost & productivity for local shipbuilding which are the inherent part for expansion of this industry [8]. The analysis also focuses on the existing access to the resources like materials, knowledge and capital for shipbuilding. Comparison of these parameters with other nations have been made qualitatively and quantitatively to find the level of our shipbuilding.

#### A. Present Condition in Bangladesh

There are more than 200 shipyards and workshops in Bangladesh, most of them are privately owned shipyards. Out of these shipyards, approximately 70 percent are located in and around Dhaka and Narayanganj along the side of the river bank of Buriganga, Shitalakha and Meghna. About 20 percent shipyards of Chittagong divisions are located along the side of the Karnapuli River and six percent are located along the bank of the Poshur River in Khulna divisions while the remaining are located in Barisal division. About seven percent shipyards have the capability to entertain quality shipbuilding right now. Another 19 percent shipyards have undertaken renovation and expansion programs for construction of ships of international standard [9]. Some new shipyards are also coming up to build export-oriented ships. Bangladeshi shipyards can build diversified types of vessel for both inland and sea travel such as: Multipurpose vessel, Fast Patrol Boat, Container vessel, Cargo vessel, Tanker, Dredging Barger, Ro-Ro Ferry, Passenger vessel, landing craft, tourist ship, Tug, Supply Barger, Deck loading Barger, Pleasure craft, crane boat, speed boat, carrying vessel, Double decker passenger vessel, deep sea trawler, self-propelled Barger, inspection vessel, cargo coaster, marine troops, Hydrographic survey boat pilot boat, Pilot boat, Hospital ship, Water taxi and Pontoon. On the other hand, some shipyards like Khulna shipyard are also capable of manufacturing small warship like: Large patrol craft, Frigates, Offshore patrol craft, Fast attack craft, Fleet tanker, Corvette etc.

### VIII. DATA COLLECTION AND ANALYSIS

#### A. Workforce

Shipbuilding is an ancient assembling industry producing tailored products, accordingly having the largest human input per unit of produce, is always moving to countries with lower wages of required skills. Bangladesh has comparatively a lower cost of human inputs and can offer the best combination of cost, quality and productivity with its fast growing young workforce that shows in table 1.

TABLE I: COMPARISON OF LABOR COST BETWEEN FEW PLAYERS OF THIS INDUSTRY

Country	labourer Cost (cost/produce )
Bangladesh	0.5
China	1.5
South Korea	6.0
Japan	12.0
Italy	13.0
France	13.0
Norway	14.0
Finland	15.0

### B. Productivity

A comparison of productivity shows that while china may be well ahead of India in total shipbuilding, its total productivity is almost the same as India. Productivity of Bangladesh workforce is expected similar to that of India.

TABLE II: COMPARISON OF PRODUCTIVITY

Country	Completion M DWT	Employees	Productivity DWT
Japan	123.2	100000	290
Korea	123.0	178100	320
China	128.8	340000	56
India	6.6	120000	50
Bangladesh	0.8	30000	40

### C. Lower Effective Cost

The following table speaks for the strength of Bangladesh to grow as a shipbuilding nation in terms of effective cost of workforce.

TABLE III: COST EFFECTIVENESS

Country	Weighted labor rate	Weighted productivity	Weighted avg. cost
Bangladesh	0.5	1.0	0.5
India	1.5	1.2	1.25
China	1.5	1.4	1.07
Korea	6.0	3.0	2.0
Singapore	4.0	2.0	2.0
Germany	15.0	5.0	3.0

### D. Geophysical Condition

Deep draft basins Excluding sand bars and shoals here and there, rivers and very deep in Bangladesh. Water frontage which may be considered suitable for organized planned shipyards. Available water depth maintained guaranteed up to Dhaka port is 3.66m. However commercial vessels navigate with 4,25m loaded draft.

## IX. PROBLEMS OF SHIPBUILDING IN BANGLADESH

### A. Infrastructure Problem

Access to the river and sea, that is, foreshore for shipbuilding entrepreneur is restricted by bureaucracy problem like unfriendly attitude of the administration toward local shipbuilding. The lack of electricity and gas supply is a major impediment which hinders the setting up of shipbuilding industries in Bangladesh. Existing ban on importation of rail and sheet pile imposed by railway authority also obstructs developing this industry. Under the present import policy and foreign currency regulation, import on CIF basis is not permissible [10]. But this industry cannot run under such a rule. Shipbuilding industry needs a lot of components, parts and accessories leading to emergency import during the construction period.

### B. Financial Problem

Shipbuilding is capital and labor intensive industry. The local commercial banks are not individually capable of making required investment in this industry. Besides, consortium financing is time consuming and a complex process, which is not so favorable for making investment in this sector. There is no standard framework for forming

consortium and as a result when a shipbuilding contract is obtained, the time lag of securing finance by forming consortium kills the contract.

## X. CONCLUSION

In spite of having very promising opportunity, in the past shipbuilding industry of Bangladesh failed to keep pace with consistency due to lack of proper government and private initiatives and this had ultimately caused non-penetration in international business as a shipbuilding nation. Even the water transport sector of this country had been receiving very low importance from the government since the independence of the Bangladesh. Inadequate number of skilled and loyal workforce is a major shortcoming for the rapidly growing industry. Government in conjunction with shipyard owners should endeavor to formulate a welfare policy for yard workers and professionals so that more people get attracted to these professions and the rate of staff turnover remains very low. Bangladesh government should allow at least few more shipyards to be established along the river Karnaphuli or sea shore at Chittagong port area. Then many international companies might be willing to set up joint venture shipyards so that medium to larger vessels could be built here and exported. Despite the low cost of labor, Bangladeshi shipyards have to bear more than 15-25% additional financial cost in various forms such as bank interest, bank guarantee, LC commission etc. Due to the current economic recession, some of the big giants involved in shipbuilding are losing their capability. Which can ultimately bring good opportunity for those countries that can manufacture ships at competitive price. From this point of view, it might be an opportunity for Bangladesh provided the aforesaid 15-25% additional financial cost is reduced substantially.

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**Mohammad Takiuddin Saki** was born in Bangladesh. He obtained BSc in Mechanical Engineering from Chittagong University of Engineering & Technology (CUET) in 2010. He is working now as “Senior Instructor” at Bangladesh Institute of Marine Technology (BIMT) since 2016 and Head of the Department, Shipbuilding Technology, BIMT. He has more than five years of working experience in Ship building industry of Bangladesh. His field of interest includes Fluid

Dynamics, Engineering Mechanics, Thermodynamics, Heat Transfer, Automation & Automobile Engineering, Engineering Operation Management, Ship Building & Ship Propulsion System, Mechanical and Electrical System of water vehicles and Renewable & Sustainable Energy.



**Mohammad Ali Martuza** was born in Bangladesh. He obtained BSc in Mechanical Engineering from Chulna University of Engineering & Technology (CUET) in 2017. He has published a number of conference proceedings in many international conference held in Bangladesh. His field of interest includes Control engineering, Aerodynamics, Mechatronics, Computational Fluid dynamics, engineering Mechanics, Thermodynamics Robotics and Renewable Energy



**Md. Nesar Ali** was born in Bangladesh. He obtained BScin Mechanical Engineering from Chittagong University of Engineering & Technology. He now working in Meghna Group of Industries as Assistant Engineer. His work responsibilities is to support & arrange manpower. Control & make purchase requisition list for continuing the production. Meghna Pulp & Paper mills is leading paper mills in Bangladesh which produce White paper, Media Paper, Industrial Paper, NCR & Book Binding.