



Ship breaking and its ecological impact

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Abstract

Ship recycling industry has been playing an important character in the economy via offering raw materials to steel industry, shipbuilding industry and some other industries in India. Ship-recycling business also creates a huge job prospects for India. Some existing problem like safety of worker, health and working environment issues drawing negative picture of this industry for the country. This paper covers the details of how ship-breaking becoming the successful industry in India, existing law for this industry, life of workers involved, and the impact on environment. It is observed issues such as the existing government laws and enforcement, safety of worker, health and working environment situation, remunerations for worker. Aim of this paper is to make out the problematic issues of this industry and then analyze the problems to help to overcome the challenges involved in ship-recycling industry. A brief overview and prospect of this industry in global perspective has also been focused.

Keywords: ship recycling, regulations, protection of Labours, environmental dangers

Introduction

Ship breaking is the process of breaking of aged ship to pick up steel particle and other substance. Ship recycling industries which recover steel from the ship comprise 90 percent in terms of value. The additional material comprise of 10 percent i.e. machinery and equipment, furniture and chemicals etc. Ship recycling process is a challenging activity which involves various concerns like ecology environment, labour physical condition and safety.

The ship recycling process moved slowly from high advanced countries to middle advanced countries and then to low advanced countries because of rising environmental concern and strict guidelines in developed countries towards health and safety of the Labours. During this activity the ship recycling industry (SRI) has transformed from being a mechanized-concentrated process to human concentrated activity. Even though SRI create the possibility for economic development, it also brings with it hazards of ecological imbalances. Till 1970's ship recycling process were operated in advanced countries. But after 1980, due to accessibility of inexpensive Labours, a move of these processes from the advanced countries to less advanced countries is observed. The countries like India, Bangladesh, China and Pakistan have less strict rules and regulations with regard to environment and also the accessibility of massive work force.

In olden times ships are broken at controlled European dry dock facilities by trained labours. After 1970's the huge expenditure on ecological controls and Labours safety rules moved the work to less costlier shores. As a result, during 1980's these countries relocated their process to less advanced countries. Besides, the accessibility of low cost Labours in less advanced countries, the implementation of strict environmental norms by advanced countries create the situation to move of these activities toward the less advanced countries. The SRI generates enormous job prospects and creates earning, as it also offers with recycling of products and scrap materials for additional production.

The life of a particular ship is 20-25 years. Subsequently it not succeeds to gather the safety condition, it is moved for recycling. The ship is sold through international broker or via cash buyers. Till 60's, ship recycling process was very advanced and operate in advanced countries like US, UK, Germany and Italy. The UK reported for 45% of ship recycling process. During 60's and 70's ship recycling processes moved to middle advanced countries, such as Spain, Turkey and Taiwan due to accessibility of low cost Labours and also the presence of re-rolling mills in these countries. About 79 countries were associated with ship recycling process. Asian yards come into operation during 80's. In spite of their delayed entry, at present these country accounts for over 95% of the SRI. ASRI has turn into important industry holding 1st place in Asian subcontinents and also in world market. Bangladesh holds 2nd place after India.

Objectives of the Study

The present study will find out the solution of the objectives given below.

1. To access the development of ship breaking business in India.
2. To highlight the issues connecting to work environment.
3. To evaluate prospective of this business in global perspectives.

History

A ship consists mostly of steel. At the end of its useful life, it becomes a source of ferrous scrap. The scrap is particularly reprocessed for manufacturing simple steel products such as steel rods used in civil engineering. A large portion of the waste generated following the demolition or scrapping process is largely returned to good use. Useable equipment is such as pumps, motors, generators etc are sold as it finds alternative applications and the scrap steel is reprocessed (Andersen, 2001: 1-2).

Ships were historically broken at regulated European dry dock facilities by skilled workers. After 1970's the high cost

of environmental controls and employees safety standards shifted the work onto cheaper shores. As a result, during 1980's these countries delocalized their activities to developing countries. Besides, the availability of cheap labour in developing world, the adoption of stringent environmental norms by developed countries acted as the major reason for the shift of these activities toward the developing countries. The ship breaking industry creates enormous employment opportunities and generates income, as it also provides with recycling of products and scrap materials for further production. According to 2001 OCED report on ship scraping, "ship demolitions remove large volume of obsolete tonnage from fleets, recycle many of the materials used in ships construction and are a major employer in the main ship breaking areas" (International Federation of Human Rights, 2000:4) [7].

On average a ship has an active life span of 25 to 30 years. After it fails to meet the safety requirement, it is sent for breaking. The ship is sold through international broker or via cash buyers. Until 1960's, ship breaking activities was highly mechanized and concentrated in industrialized countries like United States, the United Kingdom, Germany and Italy. The United Kingdom accounted for 45 percent of ship breaking industry. During 1960's and 1970's ship breaking activities shifted to semi-industrialized countries, such as Spain, Turkey and Taiwan mainly because of availability of cheaper labour and also the existence of re-rolling mills in these countries. About 79 countries were involved in ship breaking activity. Asian yards come into existence during 1980's. Despite their late establishment, at present this region account for over 95 percent of the industry. Alang ship breaking yard of India has become eminent industry holding first position in Asia and also in world market. Bangladesh holds second position after India.

Overview of Ship breaking in India

In recent time India has huge share in SRI and most of the process is operated in Alang and Sosiya, the two towns located in the coast of Arabian Sea in the district of Bhavnagar in Gujarat. The requirement of steel and also the advice of a variety of committees, the Gujarat Maritime Board (GMB) approved rigorous study of the coastal region and recognized Alang as a good number appropriate site for growth of ship recycling activity. The GMB as well as the groups of ship breakers supported the choice of this site for the following basis:

- Alang site under the huge tide area where the maximum tide arrive upto 10 to 11 meters. It is believed that most positive for ship recycling activities.
- Alang is situated in the Gulf of Khambhat and whose anchorages are protected areas during rainfall, which permits ship recycling process.
- The coast of Alang is sloping and has extensive dry area which services reaching up vessels.
- Alang sites are quickly dry during monsoon, thus helping to manage all kinds of material and equipment.
- Alang coast is not used for merchant shipping, fishing and even salt work.

It is found that 700 ships on an average are beached for recycling every year world over. The majority of ships (i.e. 400-550) are recycling in India. The SRI is operating in 9 different places in India out of which Alang- Sosiya in Gujarat is the major recycling industry. However, the major

ship recycling site is located on the western sea at Alang-Sosiya, Gujarat. The SRI at Alang- Sosiya started in 1982 and presently, 80 yards are in action and Alang- Sosiya is found to be the largest SRI in world. India has the world's largest ship recycling capability in terms of volume.

Alang- Sosiya ship recycling industry has developed from a rural community with little inhabitants of fishermen and farmers to turn into world's biggest SRI. Till 1980's ship recycling process were partial to the recycling of small-sized ship at Mumbai yard. During 1970's, the MSTC of the GOI make a decision to purchase waste ships from other countries and the Government confirm to set up SRI. During 1980's there was a huge requirement for scrap from big number of foundries and re-rolling mills in Gujarat. Therefore, GOG determined to start the SRI on Gujarat coast. The (GMB) made rigorous study and recognized Alang- Sosiya as the mainly appropriate location for concentration of ship recycling activity. In 1983, the first ship was beached and this laid the base of ship recycling at Alang- Sosiya, which has now grown as world's largest SRI. At present ASSBY consist of 193 yards of diverse sizes. The division of these yards is as given below. Table 1 show that half of the yards are of large size which are used for recycling ships of high Ldt, while the smaller yards are used for recycling medium sized ships of lower Ldt.

Table 1: Division of yards

Plot Size	Number
121 × 51 Mt	15
81 × 46 Mt	29
51 × 46 Mt	56
31 × 46 Mt	93
Total	193

Source: GMB

Gujarat Maritime Board (GMB) is an independent body which watches every ports of Gujarat and is in charge for the growth of ASI. Alang plots are hold by the GMB which lease out the plot to the ship breakers. The first lease time is for ten years which has to be renewed thereafter. Upto 90's, the Gujarat Maritime Board participated a direct responsibility in the business as it used to buy the vessels from the world market and send out them to the ship breakers on first-come, first serve basis. However, with the opening of the markets in the post 90's the ship breakers participate in the open international market to buy ships. On February 13th 1983, M. V. Kota Tenjong was the 1st ship to be beached at Alang. Thereafter, ship recycling at Alang has developed in number and reached world-class status.

Ship breaking activities

The majority of labours are migrants from different underdeveloped states of the country where work prospects are not presented or less. The Ship recycling activity, there is no official contract between owner and labour. This is the reasons workers are fully incapable to impose their rights. The earnings of labours depends on hours based and their level of skills. There are no opportunities for over time and sick leave and the range of wages is mainly from Rs. 90 to Rs.150 on daily basis

We have found most of the labor ages between 21 to 35 years old and 10% labor is between 46-60 years old. We have found that more than 10% of work forces is under 25 and 46% of labors are illiterate while 29.67% were able to

attained primary school. There is no opportunity for healthy food, hygienic toilet and medical facilities. We have found only 35% worker said that they got first aid treatment. The factory acts 1948 do not apply for the industry because the government has not recognized it as an industry. Though the staffs have been functioning in the scrap yards for years they are not permitted to form or connect a trade union to good deal and put into effect their rights.

The workers are underprivileged of proper recompense due to the lack of a suitable contract. In arrange to maximize income little attempt is done to minimize the danger of accidents. Accident is common in Ship recycling industry, due to mistreatment of processes and not significant if any inflammable chemicals are stocked within or the flaming equipment or situation that ill skilled welding workings never know. As a consequence many explosions have killed a lot of workers in the history of Ship recycling industry. It is true that victims of the industry do not report to the police. So that the actual number of victims is unknown. And even right compensation is not given to the victims' family. So environment has negative impact and on the other hand individual staffs are not getting good return. This industry pollutes oceanic ecology, sea, water, beaches, bio-diversity and surrounding environment.

The industry has been a little declining due to the international recession and more severe enforcement of countrywide laws and regulations. But the industry is now alternative ways, and the number of ship yards has increased year by year. Ship recycling industry generally generates a lot of opportunities, and it is predictable that some 30000 people are straight employed in the ship breaking business in India. In addition, another 150000-200000 is indirectly involved in this industry. Most of the workers are hired by the vessel yards through limited contractors.

Depending on work type, a worker can earn up to Rs. 300-350 per day. The majority of employee is being employed on temporary basis. And many of them are employed for downstream activities of reclining activities. We have come to know some of materials are being export and maximum material is using for reused. There is high value of some of material in local market. In particular this raw material is used for road construction, new ship plate and for many purposes.

Up to 60% steel in local market is basically come from the ship breaking yards in Alang. It is estimated that every year new yards are being constructed and more than 193 ship breaking yards along the coastal area of Alang. Maximum ship yard owners are local and renowned business men. A ship is brought around 4 to 10 million dollars depending on the condition and size of the ship. Through the middleman ship is being purchased from international sellers. The local ship breaker takes loan from bank with high rate of interest and loan is completely repaid within six months. When ship is completely ripped, all scrap is sold in local as well as in international market.

Working in the yards is really a risky job. Sometimes gases explode kills workers valuable lives. Sometimes workers fall from high sides of the scrap ship or tumbling steel parts on them. Many of them work without goggles. We have come to know that they do not have protecting clothing, shoes. Local organization and few NGOs of India have estimated that more than 1000 workers have died in last 25 years and many of them are suffering from serious diseases.

Challenges for of India ship-breaking industry

Environmental Pollution

Ship recycling industry has a great impact on the ecology. It is found that some problems that create environmental pollution. Further study elaborates some findings below.

Pollutants discharged from ship breaking and its impact:

It is observed that Ship recycling industry is one of the profitable industries in developing countries like India but there are a lot of health and human hazards. Actually it depends on the size and function of ships. Normally scrap ships is between 5000-40000 tones. And from a ship yard owner can get 95% of steel, 10 to 100 tons of paint, organ tins, arsenic, zinc, cadmium and chromium. Ship not only provide assets but also huge tons of waste up to various asbestos, thousand litter oils, in addition, hold up to 1,000 cubic meters of lasting oil. The majority of these resources have been defined as unsafe waste. In India, ships containing these materials are creature cut up by offer, on open beaches, with no reflection given to safe and environmentally welcoming waste organization practices.

From the survey it is really clear that ships are not cleaned perfectly. It is something like eye wash and try to certify ship is fully free from dangerous waste and chemical. This activity is really a threat for both public health and marine environment. It is like a tiny version of a city that discharges each kind of pollutants that a metropolitan area can create like liquid, metal, solid and dangerous solid pollutants.

Asbestos: Generally a ship of 10,000 LDT contains about 6 to 10 tons of asbestos. This fiber material being brittle or fragile easily can be broken up in dust and fiber. Thus dust of it may enter in their lungs through breathing. It may cause formulation of scar-like tissue resulting permanent breathing difficulties that is called "Asbestosis". It also cause lungs cancer and mesothelioma.

Heavy metals: Heavy metals are originated in many parts of ships such as in coatings, paints, and electrical equipment. These are used apart with no defensive measures in position and reused. The consequences are skin cancer, lung cancer, intestine, liver, Kidney or bladder. It can also reason of spoiling of blood vessels.

Oil pollution: When a ship has been broken in the yard, oil residues are being spoiled and mixed with sea water. This oil is really so much harmful for the environment and marine life. It may cause serious damages in different ways, such as reduction of light intensity beneath the sea surface. Oil on the sea water reduces oxygen and carbon dioxide in the sea interface. It also causes bird reduction in coastal areas. So often spilling may reason wide spread death amongst the fishes, mollusks, mammals, worms, crabs and other water organisms. There are many more chemicals and hazardous substances which cause human health and environment damage.

Labour Rights

Occupational health standards is not available and training as well as protection equipment is not provided in ship breaking yard

- When workers are injured there is no emergency service and access treatment on the job of this industry even

ignoring required compensation.

- Wages is less than the standards
- No over time
- There are no specific rules for the job securities
- They have no rights to form a trade union

In the common of the shipyards, staffs are being underprivileged of their rights. They work under dangerous conditions but have no right of entry to safety equipment, job safety or a living wage.

Occupational Health and Safety

In India ship breaking Industry the probability of accident faced by workers is very high than the average industrial accident in India. A study conducted on "Construction Industry of Ahemdabad" where author found that the construction work is marked by drudgery and hazards. In addition the trend towards multi-storied construction makes the work is more prone to accidents. The authors found that 14 percent of workers met with accidents. Further they found that the probability of accident is higher for the skilled, which is higher than other categories of workers (Subrahmanian, Veena and Parikh 1982:137-142)^[9].

If we consider a week, on an average a worker is died and every day, one worker is injured. It is really very easy for any ship owner to replace any workers because if one is lost 10 workers is waiting to replace him on the yard owner. The administration collects the taxes and turns an unsighted eye. Ship breaking carries danger to life. By any principles, the destruction of ships is unclean and dangerous work. The hazards connected to ship breaking generally fall into two categories: intoxication by hazardous substances and accidents on the plots. Explosions of available gas and smoke in the tanks are the major reason of accidents in the yards. Another main cause of accident is falling from the vessels (which is up to 70 m high) as they are operational with no security harness. Other sources of accidents comprise workers being compressed by falling strengthen beams and tableware and emotional shocks.

Therefore, workers go through from lung problems which cause momentary loss of working ability. The hatches and pockets of ship may hold explosive or flammable gases. The shears, if they appreciate from knowledge, drill little holes in arrange to release gases or smoke. This still however, frequently cause harsh explosions. There we have found that beaches are really strewn with harmful chemicals and toxic substance. Sharp iron sprinters can easily injured any workers. Even workers enter into the ships without protection equipment. So it is clear that occupational health and safety is not priority for the owner of the ship yard and as for the staffs. Their anxious need to find pay to support their families, their livelihoods take priority over their lives.

Treatment and compensation

In various legislations there are provisions to provide free medical treatment to industrial workers in case of occupational accidents and diseases. In Alang ship breaking yard, each yard employs more than 250-300 workers but none of the yards have doctor at site. There is not a simple doctor on staff for even one the yards. Thus workers are in a highly dangerous situation. Red Cross medical hospital exists at Alang ship breaking yard, which provide only first-aid and it cannot handle major accident cases. Medical treatment is provided at Bhavnagar in case of major

accident. Some employer provides initial medical treatment for their workers in case of major accident. It is also an area where the discretionary powers of the employer exist.

Workers at Alang ship breaking yard face high probability of occupation related accidents and health related problems. However workers are neither covered by life insurance or medical insurance. Workers report that they do not personally have any cover and many of them are not aware of such policies. The employer deals with cases of accidents and death as and when they face the situation. In case of severe accidents the employer pays partly for medication and treatment. In case of death the payments are done to the family members at the native place through labour contractors. However there appear to be no set norms through which these amounts are decided.

Laws Applicable

Central and State Governments have formulated rules and regulations to protect the interests of working class. If when these rules and regulations are not properly implemented it leads to exploitative situation. These laws are related to overcrowding, sanitation, working conditions, recreational facilities, leave facilities and exposures to fatal accidents are some of the factors, which affect the labour. These factors affect labour productivity, industrial relations and growth of the industry. Therefore, labour legislation is regarded as an important instrument in the hands of state to bring out improvement in working conditions of labourers.

In India, there are various laws which fairly, progressively intended protect the labour rights. These laws are also applicable to Alang ship breaking yard. The survey of industries in India found that the conditions of workers are unsatisfactory in many industries. There are various industrial as well as labour laws, which are applicable to organised industry and hence applicable to Alang ship breaking yard. These laws are used as the reference point to evaluate the condition of workers in Alang ship breaking yard.

Recommendations

Ship breaking industry creates equally the probability of economic development and hazard of harmful externality. SBI process is difficult methods which engage a lot of problems like atmosphere, workers wellbeing and physical condition. The industry is being gradually known as the most dangerous industry.

1. Existing laws should be strictly enforced by the government.
2. To develop a well-designed working friendly cutting plant, workers safety and environmental issues should be in high concern to make any rules and regulations in this industry.
3. It is very essential to focus on the contribution of the worker those who are involved in this industry and give their continuous effort to national and international economy as well.
4. Government organizations, NGO's, civil societies and political leaders should take necessary steps as quickly as possible for ensuring the basic rights of the workers and their family members.
5. Rules and regulations of International Maritime Organization (IMO) and "Hong Kong International Convention for safe and environmentally sound recycling of ships" have to be implemented.

Conclusions

Ship recycling industry in India supports the countries still ship building and other heavy and light engineering industries today. According to various reports, India is emerged as the first largest ship breaking nations in the world. However problems regarding safety, health and environmental issues, violation of existing laws and enforcement have created a negative image of this industry, despite the positive contribution to job creations in India. The Ship recycling industries have great potential in India as we are having the longest coastlines in the world. It is still possible to turn ship breaking into a safe and green industry which is considered a hazardous job by taking necessary steps.

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