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Analysis of Alang Ship Breaking Yard, India

Hrudanand Misra

Institute of Management, Nirma University, Ahmedabad, Gujarat, India

Corresponding author: hrudanandmishra@gmail.com

ABSTRACT

Gujarat's has been blessed with one of the longest coast lines. Besides, it also has a long glorious past, dated to almost 3000 years, manifested by the maritime commercial ties that it had developed with countries such as China, Egypt, Sri-Lanka, Greece, African and Arabian countries. Data is collect through survey in 2014-15. At start the ship breaking sector was on peak and become the No. 1 sector around the globe but unfortunately this sector in performance getting down and down with time. There are three main reasons, first, the high tax rate was imposed, second, there was no proper safety measures as we see deaths and injuries incidents are taken place, no proper medical facilities are available and third there was no proper training and education for the workforce which are engaged in this sector. All the needs of this sector to make it Green are addressed in this study properly. If all the measures which we addressed for the improvement of this sector is handled properly than this sector will contribute much more to GDP in different ways as this sector in terms of employment, and will also produce much more steel which not only fill the demand of steel domestically but also we will export it to different countries.

Highlights

- The findings show that measures for the improvement of this sector is handled properly than this sector will contribute much more to GDP in different ways as this sector in terms of employment, and will also produce much more steel which not only fill the demand of steel domestically but also we will export it to different countries.

Keywords: Migrants, Ship Breaking Sector, India

Ship breaking or ship scrapping as defined by the U.S occupational safety and health administration (OSHA) is "any breaking of a vessel's structure for the purpose of scrapping the vessel, including the removal of gear, equipment or any component of a vessel" (U.S. Environmental Protection Agency, 2000).

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.

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).

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.

Table 1 presents the number of vessels that were dismantled during 1994 and 2002. Out of 3854 vessels that were dismantled during this period 58 percent were dismantled in India alone.

Table 1: Number of Vessels by Breaking Location and their tonnage, 1994-2002

Country	Number of Vessels	Total of Ldt. (Million tons)	% of all Vessels	% of total tonnage
India	2245	16,135,949	58.25	45.09
Bangladesh	529	7,737,562	13.73	21.62
China	379	4,734,533	9.83	13.23
Pakistan	192	3,521,888	4.98	9.84
Turkey	109	379,641	2.83	1.06
Vietnam	29	372,882	0.75	1.04
Spain	18	59,439	0.46	0.17
Mexico	18	75,746	0.46	0.21
Other Countries	345	2,771,663	8.71	7.74
Total	**3854**	**35,789,303**	**100.00**	**100.00**

Source: Clarkson's Demolition Database, 2002; Note: These are some of the major countries involved in ship breaking activity.

Table also reveals that out of top eight destinations for these ships six are Asian countries. More than 80 percent of ships dismantled were done in Asia. The Asian countries also account for more than 80 percent of tonnage of these ships. Out of 35,789,303 million tones of Ldt world wide, approximately 45 percent from the ships dismantled in India. The table clearly shows the important place of India and Asia in the ship breaking industry world over.

Light displacement tonnage (Ldt): the lightweight is the displacement, without cargo, fuel, lubricating oil, ballast water, fresh water and feed water, consumable stores and passengers and crew and their effects, but including liquids in piping.

South Asia Outlook

As we say earlier that South Asia is the focus point with respect to this sectors due to bundle of reasons. Like due to cheap labor, less restrictions on buyer and sellers, no environmental safety issues, no medical insurance of work force and no proper disposal of wastages. So these are the reasons of low cost of ship breaking but this is the natural phenomena that where are ships made they are disposed on the same place but due to many restrictions and high labor cost they are attracted to South Asian countries. In 2012 as 40% of ships are scrapped in India, Bangladesh dismantles 18% and Pakistan dismantles 10% of the Global activity. Worker in this region is hired on daily basis and majority of them are illiterate and don't have any skills how to work safely. Since the past few decades there are many International and National criticism on this sector in South Asia. But only India worked on the betterment of this sector as they made hospital near to yard and made rules for worker that only ISO certified worker can be able to work.

The ship breaking industry on international or on developed country standard is hazard free that's why the cost of dismantling is too high and there are many barriers for the buyer and that's the big reasons of attraction of customers towards south Asian countries because there they got handsome money.

India Outlook

At present, India has large share in ship breaking industry (OCED, 2001) and most of the activity is

concentrated in Alang and Sosiya, the two villages situated in the coast of Arabian Sea in the district of Bhavnagar in Gujarat.

In India, upto the 1980's the ship beraking industry was concentrated in Darukhana yard near Mumbai. However, the activities were limited as it involved breaking of small-size ships. It was in the late 1970's that the MSTC decided to import non-useable ships and consequently the government decided to set up ship breaking yards. Ship breaking activities was recognized as a major source of steel supplier for the re-rolling steel plants. Subsequently in 1979 ship scrapping was recognized as an industry. The initiation of this move was also the growing demand of scrap from the large number of foundries and re-rolling mills. The state of Gujarat was one of the states where the demand for scrap was high for meeting the needs of the re-rolling mills. Therefore, the Government of Gujarat adopted policies in favour of ship breaking and set-up ship breaking yards on coast of Gujarat. This step was also backed by the reports of various committees that recommended the development of ship breaking activities.

Gujarat's has been blessed with one of the longest coast lines. Besides, it also has a long glorious past, dated to almost 3000 years, manifested by the maritime commercial ties that it had developed with countries such as China, Egypt, Sri-Lanka, Greece, African and Arabian countries.

Following the demand for steel and also the recommendation of various committees, the Gujarat Maritime Board (GMB) carried intensive survey of the coastal region and identified Alang as the most suitable site for developing ship breaking activity. The GMB as well as the groups of ship breakers endorsed the selection of this site for the following reasons:

1. The site falls in the high tide zone where the highest tide reaches upto 10 to 11 meters. This is considered to be most favourable for ship breaking activities.
2. This site is located in the Gulf of Khambhat and whose harbours are protected areas during rainy season, which allows ship breaking activity.
3. The coast of Alang is sloping and has a long dry area which facilities reaching up vessels.
4. The seabed at Alang dries up very quickly even during monsoon, thus facilitating the handling as all kinds of material and equipment.
5. The area along the coast as Alang is free from other competitive users, like merchant shipping, fishing and even salt work.

Alang is a small coastal village as the district of Bhavnagar in Gujarat, dominated by a small population of fishermen and farmers. Presently, it has turned out to be one of the largest shipbreaking yards not only in India but also in the world. The yard stretches over 15 Km and actually covers two yards (Alang and Sosiya). The Alang ship breaking yards have the capacity to break VLCCs[1*] and ULCCs[2**] vessels, a facility not available to any other ship breaking countries in the world. Furthermore, unlike other countries where the ship breaking activities is capital intensive in India it is labour intensive. Being a labour surplus country labour is available in plenty and that too at competitive rate. Alang ship breaking yard provides large number of employment opportunities to number of skilled and unskilled labours. Moreover, there are many other activities and industries which are directly and indirectly dependent on Alang ship breaking yard, and the number of such workers directly and indirectly employed is estimated to be in between 1.5 to 1.6 lakhs (International Federation of Human Rights, 2000: 56). This also includes the downstream industries generated by the ship breaking industry such as re-rolling mills, foundries, oxygen plants, local scrap store, transportation companies and other small local businessmen and upstream activity such as brokers, service sectors etc. A survey conducted by the International Federation of Human Rights (FIDH) found that 100 re-rolling mills are functioning in the area and each generally employs between 80-120 and thus employing about 8,000-10,000 workers.

The existing site of Alang-Sosiya ship breaking yard (ASSBY) comprises of 183 plots of different sizes. The break up of these plots is as given below. Table 2 which clearly indicate that more than half of the plots are of larger sizes which are used for breaking ships of higher Ldt., while the small size plots are

[1*] Very Large Crude Carrier: Tanker of 160,000-320,000 Dead Weight Tonnage.
[2**] Ultra Large Crude Carrier: Tanker of 320,000 Dead Weight Tonnage.

used for breaking medium sized ships of lower Ldt. All these plots are developed by Gujarat Maritime Board which is also the owner.

Table 2: Distribution of Plots of Alang Ship Breaking Yard

Plot Size	Number
120 × 50 Mt	10
80 × 45 Mt	24
50 × 45 Mt	56
30 × 45 Mt	93
Total	183

Source: Gujarat Maritime Board.

Gujarat Maritime Board (GMB) is an autonomous institution which monitors all the ports of Gujarat and is responsible for the development of ship breaking yard at Alang. All the plots are owned by the GMB which lease out the plot to the ship breakers. The initial lease period is for ten years which has to be renewed thereafter. Upto 1990's, the Gujarat Maritime Board played a direct role in the business as it used to buy the vessels from the world market and dispatch them to the ship breakers on first-come, first serve basis. However, with the opening of the markets in the post 1990's the ship breakers compete in the open international market to purchase ships.

On February 13th 1983, M.V. Kota Tenjong was the first ship to be beached at Alang. Thereafter, ship breaking at Alang has grown in number and reached world-class status. Table 3 gives the number of ships beached and average ship LDT. During 1982-83, 5 ships were broken and the average output was 24,716 Ldt. It was a small but a good beginning of ship breaking activity at Alang. In year 1983-84 and 1984-1985, the number of ships broken was 51 and 42 with an average output of 259,387 and 228,237 Ldt., respectively. This rise continued till 1987-88, however a sudden decline in the ship breaking activity was recorded in the year 1987-88, but thereafter the activities marked an upward swing. Upto 1991-1992, total number of ships broken were 601 and total output was 3,514,783 Ldt. From February 1982 to January 2005 Alang ship breaking yard processed 4,135 and total Ldt recovered was 29,875,654 million tons with an average 180 ships with 1,298,942 Ldt., per year. The rise in the breaking activities is attributed to the cost advantage involved in the breaking large ships. Alang and Sosiya have become the destination of all type of ships viz, oil tankers, war ships, cruise ships etc that have surpassed their active economic life span. Presently it has become the largest yard for ship breaking activities placing India on the top of the world's list in terms of ship breaking activities.

Table 3: Ships Broken at Alang Ship Breaking Yard

Year	No. of Vessels	Light Displacement Tonnages (Ldt) (Million Tones)	% of all Vessels	% of total tonnage
1982-83	5	24716	0.12	0.08
1983-84	51	259387	1.23	0.87
1984-85	42	228237	1.02	0.76
1985-86	84	516602	2.03	1.73
1986-87	61	395139	1.48	1.32
1987-88	38	244776	0.91	0.82
1988-89	48	253991	1.16	0.85
1989-90	82	451243	1.98	1.51
1990-91	86	577124	2.08	1.93
1991-92	104	563568	2.52	1.89
1992-93	137	942601	3.31	3.16
1993-94	175	1256077	4.23	4.20
1994-95	301	2173249	7.28	7.27
1995-96	183	1252809	4.43	4.19
1996-97	348	2635830	8.42	8.82
1997-98	347	2452019	8.39	8.21
1998-99	361	3037882	8.73	10.17
1999-2000	296	2752414	7.16	9.21
2000-01	295	1934825	7.13	6.48
2001-02	333	2727223	8.05	9.13
2002-03	300	2424522	7.26	8.12
2003-04	294	1986121	7.11	6.65
2004-05 up to Jan-05	164	785304	3.97	2.63
Total	**4,135**	**29,875,659**	**100.00**	**100.00**

Source: Gujarat Maritime Board.

Ships Dismantled in India

Personal Protective Measures: The personal protective measure is one of the basic needs of this industry, which is totally ignored in India. Some of these basic personal protective equipment's which are barely used at Alang are helmets, climbing

gear, mask for respiratory protection, proper shoes, and most important thing googles used in torch-cutting are barely used. These are basic needs for protections are not given to worker in Alang ship breaking yard. Things which are given a rejust hat, shoes, and simple googles and due to high temperature and humidity workers couldn't use them. And nobody is properly asked that why they are not using them simply no proper rules and safety measures.

Environment Protective Measures: Ship breaking industry is hazardous to both regarding safety of worker and safety of environments also. As ship are broken into pieces so there is no proper storage for scraps. And there is no such disposal of wastes which is the main cause of pollution. These ships contain more toxic materials like asbestos, heavy metals, polychlorinated biphenyl, polyromantic hydrocarbons, and organotin like tributyltin. There is no proper procedure to dispose off all these toxic materials safely. Basically these are the main toxic materials which are hazardous for both workers life and for environment. The scraps which are cut down from the ship are placed in any open area in the yard and there is no proper place to keep them safe.

Incidents: Basic reasons of the injuries which workers are facing day by day is just only because of safety measures, which includes not only the use of protective instruments but it also a signal to educated the work force through proper technical and vocational training. Different cases of injuries can in front like cuts, burns and many more. According to Misra, H, monthly 43% are cuts and burn injuries which are taking place. Other reasons of all these injuries are daily wages workers as mostly workers are on daily wages system and they are not proper trained and not even trained for long term, shocking thing that the foreman of workers are not even trained. Numbers of worked dead in this ship breaking yard due to ill safety measures as more than 50 workers between 1998-2003. And most of these deaths are because of explosion, height fallings, crushed under steel plates, and mostly by suffocation. These are the recorded deaths; injuries and much causality are not recorded.

Survey Based Analysis on Ship Breaking Industry

According to various survey conducted in India regarding ship breaking industry and following details are the survey based details which we conducted. And with the help of data we clearly draw a precise picture of skill gap analysis in the ship breaking industry Alang, India.

A wide diffusion of literacy and education is indispensable to the processes of development both in economic and social terms. Though education by itself does not generate socio-economic progress, the lack of it can certainly be an impediment in the development process. A certain minimum development of literacy is therefore a basic requirement for the people to get out of ignorance and backwardness. This also enhances the employment opportunity of a person. The present study on migrants from different states shows that 33.7 percent are illiterate which less than the literates, while number of literates is higher (Table 4).

The table also shows that respondents having primary level education are less than the (23.3 percent). Only one respondent has technical education and 3 respondents are Graduates. Table 4 also shows that respondents from the five states are mostly literates i.e. 66.3 percent. The percentage

Table 4: Distributions of respondents by their Level of Education

Education Level	U.P	Bihar	Jharkhand	Orissa	Gujarat	Total
Illiterate	22.12 (25)	32.23 (10)	38.89 (28)	47.30 (35)	30.00 (3)	33.67 (101)
Primary	16.81 (19)	25.81 (8)	19.44 (14)	32.43 (24)	50.00 (5)	23.33 (70)
Secondary	46.01 (52)	35.48 (11)	30.56 (22)	18.92 (14)	20.00 (2)	33.67 (101)
High-Secondary	14.16 (16)	6.45 (2)	6.94 (5)	1.35 (1)	—	8.00 (24)
Graduation	—	—	4.17 (3)	—	—	1.00 (3)
Technical	0.88 (1)	—	—	—	—	0.33 (1)
Total	**100.00(113)**	**100.00(31)**	**100.00(72)**	**100.00(74)**	**100.00(10)**	**100.00(300)**

Source: Field Survey, 2004; Note: Figures in bracket are number of respondents.

of illiterate is higher from Orissa state, which is 47.3 percent. Several studies showed that migrants are more educated than non-migrants with respect to the place of origin (Singh and Yadava, 1981a: 33-46 and Singh 1985). Studies on developing countries also pointed out that most of the migrants are educated and the process of migration has education selectivity (Singh and Yadava, 1981b: 392-411). Present study also supports the above studies that migrants are more educated. However, migration process is not education selectivity because the percentage of illiterate is also high i.e. more than 30 percent. It is also found that educated people are less interested in taking agriculture as their occupation.

The table shows that most of the respondents have low levels of education or none at all. Only around 10 percent of the respondents have tertiary or higher education. This in a way speaks about the nature of the industry that is drawing these labours from various regions of the country. Looking at the educational background it can be inferred that the labour is largely unskilled and at most semi-skilled.

In Alang ship breaking yard, accidents are common and workers have to handle various types of chemical and toxic substances. Therefore, the authority and the principal employers should provide safety equipment. Table 5 shows that the respondents in Alang ship breaking yard that use helmet, shoes and gloves while working are only 54.7 percent. Authority or employer is reported to have provided all safety equipments to only 15 percent of workers. Authority or employers only provide helmet, which is 80.3 percent, but do not provide all protective gear, which are required by workers at the workplace. Due to lack of safety equipment and lack of safety laws in Alang workers face accidents and health problems. Factories Act, 1948, provides that employers or authorities should provide safety equipment to workers working in hazardous industries.

In Alang ship breaking yard the use of safety equipment other than helmets by workers is rarely seen because workers themselves have to purchase them. The employer and authorities are not providing the safety equipments regularly, if provided, and then they deducted the amount from the workers wages. Most of the skilled workers are wearing or using protective equipment but most of manual labours in Alang ship breaking yard are using only helmet as the protective equipments.

Helmets, shoes and gloves are basic safety requirements that every industrial workers needs to use. From table 5 it is clear that only 55 percent of the respondents at Alang ship breaking yard use all the three. The authorities do not seem to take the responsibility of providing this equipment as most the respondents have reported to have purchased the equipment themselves but the authorities are not implementing the compulsory use of this equipment. Within Alang ship breaking yard there are workers involved in activities that are more risk prone. The implementations of safety norms have to greater in this activities/work, but the ground reality seems to be otherwise.

In the context of large scale growth of the ship scrapping industry, the awareness of safeguarding the health and safety of workers as well as the protection of the neighborhood population assumes all time importance. The hazardous and toxic substances found in Alang ship breaking yard are common to all ship breaking yards.

Most of the accidents occur at Alang due to the explosion of the gas cylinders when the ship is being opened for cutting. In 1997 there was an explosion in Alang causing almost 50 deaths. It opened the eyes of the authorities, and then came in place measures to prevent such accidents. Thus authorities imposed gas free certificates for all vessels. Workers wear goggles and helmets, because a norm after this incident.

Table 5: Type of Safety Equipment Used by Respondents and Provided by Authority

Type of Safety Equipment	Respondents Used	Authority Provided
Helmet	39.67 (119)	80.33 (241)
Helmet & Shoes	3.00 (9)	0.67 (2)
Helmet, Shoes & Gloves	54.67 (164)	15.00 (45)
Nothing	2.67 (8)	4.00 (12)
Total	**100.00 (300)**	**100.00 (300)**

Source: Field Survey 2004; Note: Figures in bracket are number of respondents.

Recommendation/Optimal Solutions

As we discussed earlier on all the three main issues which are personal protective measures,

environmental protective measures, and Incidents which are taking place. All these issues which this sector faces is because of many reasons like no proper safety measures, absence of training, no permanent workers, no hospital facilities nearby, and many more. So, these are some basic and important factors that are neglected due to which we can't meet the international standards. These are the basic things which are the reasons of pollution, death of workers, injuries and many diseases associated with it.

To match up the ship breaking sector of developing economies with developed economies there is need of proper machinery, safety dresses, shoes, googles, mask, medical facilities, worker proper training, and their safety. Another thing the ship breaking yard should be shift to the costal side of the beach just for to make it easy the disposal of wastes. And there will be proper medical facilities in case of injuries. And this step is only possible with the collaboration of Government authorities, Private business, and international organization.

The above paragraphs are regarding to safety measures and the current paragraph is about the productive measures. To revive this industry back to his level of 80's government have to reduces taxes *i.e*. imports duties and tax on scraps. By doing this sector performance will be better and they can contribute more to GDP. And worker performance can only be speed up only to educate them.

Immediate Applicable

This is also a kind of solution which will be immediately applicable. As government can do anything like for the orange train project the government of Pakistan free the custom duties on the machinery, equipment's which are used in this project. So like orange train project if government also focuses on this project and also release custom duties on the modern machinery used in this sector and other advanced safety equipment's. Beside this government should also have to low the tax imposed on this sector. And government should also give subsidy in term of free electricity to this sector.

Medium Term Solution

Medium term solution means that all the stakeholders try to educate the engaged worker through proper technical and vocational certificates. This can not only handled the injuries which takes place day by day but also the production of this sector defiantly raises. As production rises so automatically the employment opportunity rises and in this way contribution to GDP rises. Another important thing that there are proper medical facilities in case of injuries and a hospital can be built nearby.

Long Term Solution

Long term solutions includes that government shows cooperation with ship breakers by giving them facilities in term of tax reduction and make this industry the "Green Ship" industry which means hazard free, in all cases personal safety and Environmental Safety. So these are the only issues and if these issues are handled properly than this will be one of the leading industries which contribution will be much more and more in near future?

CONCLUSION

This study focuses the most ignored and the highest imposed taxed sector of India, which is ship breaking sector, this study almost, covers each and every basic needs of this sector due to the ignorance of these basic needs this sector becomes the most hazardous industry of India. The very first issue is of safety procedures for the engaged work force which is totally neglected as the work force were not properly trained and most of them are from informal sector and on daily wages system. No concept of permanent employees and this is one of the burning reasons due to which injuries and deaths are taking place every next day. Secondly there were no proper medical facilities for the injuries and beside this the workers have no life insurance. Before the era of 1980's this sector was the world's leading industry and after 80's this sector became the world 2nd dismantling industry just because that high tax rate was imposed and other protective measures. This sector is labeled as the most hazardous sector because there were no proper environmental and life cure policies. All these factors are followed by the main issue as there is no proper education for work force. According to the survey result the skill work force is their basic need as there are no worker with higher education. If the work force is properly educated through different

certificates and diploma than the injuries are death ratios become minimum and the environmental pollution are also be minimized. And ultimately the production increases and the contribution to the GDP also increase which is our ultimate goal.

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