SHIP DISMANTLING

A status report on South Asia

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SHIP DISMANTLING: A status report on South Asia

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Table of Contents

List of Abbreviations

CPCB	Central Pollution Control Board of India
DNV	Det Norske Veritas
DWT	Dead Weight Tonnage
EC	European Commission
EU	European Union
FIDH	An international federation of human rights organizations, a public interest organization under French law
GMB	Gujarat Maritime Board
GPCB	Gujarat Pollution Control Board
HPC	High Power Committee appointed by the Supreme Court of India
ILO	International Labour Organization
IMC	Inter-Ministerial Committee appointed by the Supreme Court of India
IMO	International Maritime Organization
ISSAI	Iron Steel Scrap and Ship Breakers Association of India
JWG	Joint Working Group of Basel Convention, ILO and IMO
LDT	light displacement tonnage
LPG	liquefied petroleum gas
MARPOL	International Convention for the Prevention of Pollution from Ships, international treaty regulating disposal of wastes generated by normal operation of vessels
MARAD	Maritime Administration, an agency of the government of USA
NGO	non-governmental organization
PAH	polyaromatic hydrocarbons
PBB	polybrominated biphenyl
PCB	polychlorinated biphenyl
PIC	prior informed consent under the Rotterdam Convention
PVC	polyvinylchloride
SC	Supreme Court of India
SCMC	Supreme Court Monitoring Committee, formed 2003 to monitor the orders of SC and disbanded, 2006
TBT	tributyl tin
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
YPSA	Young Power in Social Action, an NGO based in Chittagong

List of Tables

SUMMARY

Ship Dismantling—A Status Report on South Asia aims to present the prevailing condition in ship breaking yards across the Indian subcontinent, particularly India and Bangladesh. The Pakistani ship breaking industry seems to be in irreversible decline and is therefore hardly mentioned in this report. The report sheds light on the ship breaking business, environmental standards, and working conditions in the yards. The current situation is described through the researcher's personal experience and recent observation of conditions in the yards and through examples. The largest ship breaking yard in India and in the world, Alang, is studied in the greatest detail.

Ship breaking yards are the final resting place for end-of-life vessels. The ships are cut and ripped apart by thousands of migrant workers from the poorest parts of the country. The process of cutting up the ship is often called ship 'breaking', 'scrapping', or 'dismantling'. The industry recovers valuable metals such as steel, fixtures, and other useful parts. The ship breaking yards in South Asia have contributed much value to local business and have provided direct and indirect employment to thousands of people.

The data and information compiled by authorities on the impact of the industry on environment and workers' safety seem to be underestimated or conservative. Some of the data—such as casualties due to disease—are not maintained, monitored, or analysed. Discussions with workers and others confirm a picture of unsanitary environmental practices and poor workers' safety. Fires and falls cause the most deadly accidents, while oil spills and dispersion of toxic substances are the worst suspected environmental problems.

International bodies like the International Labour Organization (ILO), International Maritime Organization (IMO), and the United Nations Environment Programme (UNEP) have all issued guidelines to improve environmental and labour conditions. The EU has formulated a strategy towards ship breaking that should contribute to better practices when ships from European ship owners are sent for dismantling. However, local authorities must implement most of the regulations. In Bangladesh, regulation is largely absent, while in India regulation suffers from a lack of coherence among a multitude of agencies and required permits. The recipient countries also depend on adequate inventories of hazardous materials that the ship owners should provide. Sometimes it is not clear who is liable for the contents and materials of the ship. The international agencies and the source countries have not yet done enough to prevent shady and illegal practices in the ship trade and incorrect registration before the ship goes for scrapping.

While both ship breakers and the authorities of the State of Gujarat in India promised to take some meaningful action (such as promoting the building of a hospital, banning the burning of waste, prescribing protective gear and more machines for dangerous parts of the job), these measures are only partially implemented in practice. The scant reports on Bangladesh notice no improvement, despite the involvement of the ILO and the IMO.

It is recommended that certain policy initiatives should be considered—at several levels—to improve the situation in South Asia. One such initiative is that the international community, as part of agreements such as the Basel Convention, should press the International Maritime Organization and other stakeholders to implement improvements such as better tracking of ships, transparency of the ship owner's location, and provision of inventories of materials used in ship construction. The international community could also help recipient countries upgrade ship dismantling yards and regulatory frameworks and eliminate unfair competition that compromises workers' safety and the environment. Thereafter, if environmental protection and workers' safety is sub-standard, the international community could discourage ship dismantling.

National governments could also promote a 'level playing field' through bilateral or multilateral cooperation (such as India and Bangladesh), formulate a multi-sectoral policy and country-level strategy, monitor compliance better, promote unbiased research, facilitate transparency and civil society involvement, and use technology to upgrade ship breaking facilities.

Local governments, most directly involved in regulating the industry, could rationalize and integrate permits to avoid needless hassle. To promote compliance, it could ensure (with assistance from the national government) that the revenue from permits is used for development work and better infrastructure. Local government could also raise awareness within industry and among workers about sustainable development and help facilitate it. Finally, local government could be more transparent in providing information to the public and involve civil society more thoroughly in strategies and activities to improve the situation.

1 INTRODUCTION

There are only a few studies available that examine the current status of ship breaking yards. The EU-India Action Plan Support Facility – Environment Technical Assistance project, working in close coordination with the Government of India, has been requested to perform this study to bring out the current practices in ship breaking yards.

The ship breaking industry in South Asia has been under pressure because of alleged abuse of the environment and occupational health hazards. It is seen as a polluting industry that has adverse effects on the ecosystem and human lives, particularly the workers'. Enforcement of regulations in the ship breaking industry is weak, especially in Pakistan and Bangladesh. Ship breaking activity is associated with dirty jobs, numerous deadly accidents, insecure labour, environmental injustice, and violation of human rights. However, despite its problems, ship breaking is important as an economic activity for developing countries, especially for the Indian subcontinent, in terms of employment generation and availability of resources, particularly steel. The present study attempts to understand the current situation of the ship dismantling industry, especially with regard to developments in the business scenario, and its environmental and occupational health hazards.

In spite of national and international attention on the issues, problems associated with ship breaking continue. Accidents have been reported this year in both India and Bangladesh, which allegedly killed 20 workers (5 in India and 15 in Bangladesh). As recently as October 2009, there were several reports in Indian media about a controversy around a ship with allegedly toxic substances that landed at Alang from the USA.

1.1 OBJECTIVE AND METHODOLOGY

1.1.1 Objective

This report examines the current situation mainly to understand the characteristics of ship dismantling, to what extent it damages the environment, the steps taken recently to achieve improvements, the dynamics of the sector, the actions of various international agencies, and the significance of treaties.

The research focuses on India and Bangladesh, as these two countries are the leaders of the ship breaking industry, both in numbers and tonnage. Pakistan's ship breaking industry is small, and collection of information difficult.

1.1.2 Methodology and sources of information

This report is based mainly on the experience of the researcher. In addition, interviews have been held and secondary sources (internet, publications) have been consulted for essential updates and insights.

The methodology consisted of interviews with stakeholders. A focus group discussion was conducted among workers to know about the facilities available. Media clippings and other reports published by civil society groups and government institutions were also included in the research methodology. The information about Bangladesh was collected through secondary sources only.

1.1.3 Limitations of the study

There is very little information available about Pakistan and Bangladesh and the researcher has not visited the site, therefore the information from there is sketchy. On India and its site in Alang, Gujarat, there are some studies, and the researcher visited the site. The sensitive nature of the subject caused some controversy, and differences in interpretation of the issues are reflected in the studies as well. Work is seasonal and workers temporary; therefore, only a few can share a long term, continuous experience.

1.2 BACKGROUND

The first ship breaking activity in South Asia started in 1912 in Garden Reach near Kolkata, and in Mumbai. Just before 1947 Pakistan witnessed its first ship breaking operation, which took more organized shape immediately afterwards. Ship breaking activity entered Bangladesh in a quite accidental way: during a severe cyclone in 1960, a Greek ship named *MD Alpine* was stranded on the shore of Sitakund. After some time, the Chittagong Steel House brought the vessel in and scrapped it.

Steel scrap was valuable even in the early stages, and many countries were keen to accommodate ship breaking yards. Ship dismantling became important at the end of World War II. The oil boom in the Middle East made sea transport of oil and gas necessary, and as a result large oil tankers were built. Innovations allowed

refrigerated vessels to be built from around 1950 onwards. All these ships started to age by the mid-1970s and ship breaking activity reached new heights in Western countries. When the first recession in the shipping industry came around 1984 and fleet owners decided to dispose of ships in larger numbers, there was a huge backlog of ships to be demolished. Labour was becoming expensive and steel scrap was yielding less in industrialised countries, so cheaper destinations were sought.

India was slow to take on ship dismantling. The first round of relocation of the industry took place in Taiwan and Korea, countries that were fast experiencing the industrial boom and needed huge quantities of steel. But once the industry there expanded and wages rose, the ship breaking activity moved on to the poorer countries in the Indian subcontinent.

In the 1980s, there was an increasing use of electric arc furnaces and a corresponding rise in demand for steel melting scrap. The re-rolling mills were expanding their industries very fast, particularly in North and West India. This was driven by the boom in the construction sector caused by rapid urbanization. After the economic liberalization measures in 1991, the activity proliferated, driven by the huge supply of battleships sent for scrapping after the Cold War. Ship breaking in its new shape found a suitable place in Gujarat's Alang.

Similarly, Bangladesh also witnessed a ship breaking boom triggered by demand for steel in the early 1980s and the country's lack of iron ore mines. The country is largely dependent on imported steel, and took a decision to promote ship dismantling in a big way. Today, it is very important for employment and foreign exchange. The main yard is located at Sitakund, north of Chittagong city on the Bay of Bengal.

After initial growth, Pakistan's ship breaking activity declined, because of high customs duties and increasing competition from India and Bangladesh.[1]

1.3 THE MAIN SITES OF SHIP DISMANTLING

Ship breaking in South Asia is concentrated in three places: Alang and Sosiya on the west coast in the State of Gujarat, India; Chittagong on the shores of Sitakund on Bay of Bengal, Bangladesh; and Gadani in Karachi, Pakistan. India still breaks the majority of the ships in the world; see Table 1-1. However, the highest tonnage is being dismantled by Bangladesh.[2] Bangladesh's advance is still hindered by lack

Table 1-1 Number and tonnage of ship dismantling in South Asia and China (2008)

Country	No. of vessels	Tonnage (in '000 GT)
Bangladesh	170	4,176
India	198	2,548
China	38	928
Pakistan	25	374

Source: Lloyd's Register, 2008. Ship size coverage: 100 gross tonnage and over

1 Masood (2001-12-24). "Ship breaking attracting entrepreneurs". DAWN group of newspapers

2 http://www.sajn.or.jp/e/statistics/Shipbuilding_Statistics_Sep2009.pdf

of allied services. India's Alang, being near the industrial town of Bhavnagar, has no dearth of financiers, whereas Bangladesh regularly faces financial constraints. China has recently started challenging India and Bangladesh, but the Chinese ship breaking business is yet to achieve a significant level and sustain its recent emergence and progress.

1.3.1 Alang and Sosiya ship breaking yard in India

The ship breaking yard at Alang is located in the Saurashtra region of Gujarat off the Gulf of Cambay. It was set up in 1983 on a small scale along a 10-km stretch of sandy beach. The tidal, geographical, and climatic features make Alang an ideal ship breaking location.

1.3.2 Sitakund ship breaking yard in Bangladesh

Ship breaking in Bangladesh is concentrated in Sitakund (Bhatiary to Barwalia), north of Chittagong city in the Bay of Bengal. The ship breaking industry provides 80 per cent of the country's steel needs, and contributes to the production of other industries such as cement and construction materials.[3] According to local press news and reports, ship breaking provides about 30,000 people direct employment and between 100,000 and 200,000 indirect employment.[4]

Ship breakers in Bangladesh pay a lower customs duty than in India and Pakistan. Most ships broken in Bangladesh are oil tankers, as they provide the most steel. However, the demolition of oil tankers is dangerous. Bangladesh suffers the most fires and accidents, and its coastal zone and fisheries are vulnerable.

1.3.3 Gadani ship breaking yard, Karachi, Pakistan

In the 1980s, the Gadani ship breaking yard was described as the world's largest, with more than 30,000 direct employees producing about 1 million tonnes of scrap. By 2001, only about 160,000 tonnes of scrap were being produced. High customs duty and competition from ship breaking yards in India and Bangladesh have reduced Gadani's output. A reduction in taxes on scrap metal improved production modestly, but it is still much below its past volume. Gadani employs around 5,000 workers.

3 Ship breaking in Bangladesh, YPSA Report, 2004

4 Richard Bradley, Battleship Beach, BBC, 1989

2 THE SITUATION AND REGULATION OF THE SHIP BREAKING INDUSTRY

Though ship dismantling activity in South Asia is meant to be regulated by national and local governments, Pakistan and Bangladesh lack dedicated rules and regulations. Therefore, this chapter focuses on India.

2.1 LEGAL STATUS IN INDIA

India has an extensive regulatory framework for ship breaking, although some regulations apply to other sectors as well. In 1979, the Government of India and the Government of Gujarat recognized ship dismantling as a manufacturing activity under Chapter 15 of the Central Excise Rules for the purpose of sales tax. It was brought into the manufacturing category for the purpose of income tax.[5] It is subject to inspection rules under the Occupational Safety and Hazards Act and the principles of the Indian Factories Act, 1948 for labour safety and occupational health.[6]

5 Mumbai High Court Order, 1998

6 CPCB Survey of Compliance of Guidelines, Alang, 2000

The ship breaking activity in India is regulated at three levels.

1. Before anchorage

The ship breaker has to book the ship by paying earnest money of 10 per cent of the ship's value. Only then can he bring the ship in question for demolition to a national anchorage point.[7]

2. At anchorage point or on the high seas

The customs department makes a first visit to the ship on the high seas to check its inventory. If the department assesses that the ship does not carry any cargo or item banned by Indian laws, it gives its clearance for demolition. The surveyors then conduct a value assessment of the ship, which is matched with the figure in the ship breaker's invoice to identify any discrepancies upon which action can be taken.

The Gujarat Pollution Control Board (GPCB) thereafter examines the ship for toxic material. They generally check the toxic materials in free form and the uncontaminated materials in the ship's structure. Then they issue a decontamination certificate according to the Hazardous Materials and Wastes Rules, 1989. Ships generally do not carry any inventory of hazardous materials, so the GPCB issues decontamination certificates based on cargo materials.[8]

The Department of Explosives issues two certificates: 'Gas Free for Man Entry' and 'Gas Free for Hot Work', which means that the ship can be cut by torches. Sometimes, the Atomic Energy and Radiation Board is also requested to check for radioactive substances.

Next, the Gujarat Maritime Board (GMB) issues a 'Naked Light Certificate', which certifies that the ship is safe for lighting gas torches. The GMB examines all the approvals given by the GPCB, the customs and explosive certification, the plot owner's own record of waste disposal in the manner prescribed by the Hazardous Materials and Waste Rules and of labour safety and workers' insurance and, if satisfied, issues the beaching permit.

3. During demolition

The GMB is the authority designated to ensure compliance with all ship breaking rules and regulations. It also oversees hazardous waste generation and disposal. Default or non-compliance results in the cancellation of the permit. The ship breaker can get a new permit only after a full re-inspection. The GMB conducts its monitoring activity every quarter. It conducts more inspections when accidents take place.

The factory inspector works in coordination with the GMB to ensure that all safety gear requirements are adhered to. If the procedure for worker safety is found flouted, the factory inspector is obliged to inform the GMB, who revokes the dismantling and beaching permit for the next ship.

7 National Anchorage means the nation in which the ship is going to be broken.

8 President of Indian Ship Breakers' Association

Ship breakers in India have to submit the following certificates before they receive permission for cutting.

1. Cargo Free Certificate
2. Decontamination Certificate
3. Atomic Radiation Free Certificate
4. Gas Free for Man Entry
5. Gas Free for Hot Work
6. Naked Light Certificate
7. Waste Disposal under Hazardous Materials and Waste Rules
8. Labour Insurance Certificate
9. Factory Inspector Certificate
10. Beaching Permission

The authorities involved in the inspections are:

1. Customs Department
2. Gujarat Pollution Control Board
3. Department of Explosives
4. State Factories and Labour Commission
5. Atomic Energy and Radiation Board
6. Department of Inspection
7. Gujarat Maritime Board
8. Inter-Ministerial Committee

The multitude of bureaucratic instruments and institutions makes it cumbersome for the ship breaking sector to obtain timely permission, even if compliance is not a problem. For this reason and others, ship breakers often work their way illegally around the regulations.

2.2 LEGAL STATUS IN BANGLADESH AND PAKISTAN

TThe legal status of ship breaking in Bangladesh and Pakistan is unclear; there is no specific regulation even after 30 years of operation. It is assumed that some

Table 2-1 Status of existing rules and regulations in ship breaking yards in South Asia

Parameters	India	Bangladesh	Pakistan
Specific Rules for Ship breaking	Yes	No	No
Cargo Free Certificate	Yes	Yes	Yes
Gas Free Certificate	Yes	No	No
Waste Disposal Facility	Yes	No	No
Labour Insurance	Yes	No	No

Source: Observation from various reports

basic procedures such as customs checks are mandatory in Bangladesh and Pakistan. However, the Government of Bangladesh does not follow the 'Gas Free for Hot Work' certification, and as a result it is easier to beach oil tankers. The other significant rule in Bangladesh is the Factory Act, 1965.[9]

2.3 ECONOMIC IMPORTANCE AND LINKS TO THE STEEL INDUSTRY

Global ship breaking capacity was estimated at 8.28 million tonnes in 2008.[10] India demolished 198 ships and 2,458 tonnes[11]; Bangladesh 170 ships and 4,176 tonnes.[12] Ship breaking is a labour-intensive industry: India employs about 35,000 workers each year;[13] Bangladesh about 30,000 workers;[14] and Pakistan, which had over 30,000 workers before 1980, employs about 5,000 workers now.[15]

Besides the direct employment it generates, the ship breaking industry also provides spin-off to other industries, such as re-rolling mills and suppliers of oxygen and liquefied petroleum gas (LPG), and also to scrap processors and traders involved in selling second-hand products such as furniture and fittings from ships.

2.4 GLOBAL SHIP BREAKING INDUSTRY

India and Bangladesh, though still the biggest ship breakers, have been recently losing share to China, because it pays ship owners more for their end-of-life-vessels.

Most oil tankers (80 per cent) are sent for scrapping to Bangladesh as its fire safety rules are less stringent than elsewhere.

When broken, a ship yields nearly 70 per cent of its light displacement tonnage (LDT) as re-rollable steel scrap. Another 6 to 10 per cent of its LDT weight constitutes melting scrap.[16] There is a weight loss of 10 per cent due to rusting and other wear and tear. Of the remaining 10 per cent, about 1 per cent is furniture, 5 per cent is machinery (generators and appliances), 1 per cent is non-ferrous scrap, about 0.6 per cent is used diesel oil, and 0.5 per cent is other waste material.

9 End of Life Ships - The Human Cost of Ship Breaking, a Greenpeace report, 2005

10 Ship Breaking in the OECD, Working Paper 18, 2003, Danish Environmental Protection Agency, Denmark

11 http://www.sajn.or.jp/e/statistics/Shipbuilding_Statistics_Sep2009.pdf, http://www.denizcilik.gov.tr/dm/dosyalar/IMO%20Mr%20Mikelis.pdf

12 YPSA Report and Fact Finding in Ship Breaking Yards in Bangladesh

13 Interview with the president of Indian Ship Breakers' Association

14 The End of Life Ships - Greenpeace and FIDH report

15 Various news items published in the newspaper *Dawn*

16 Iron Steel Scrap and Ship Breakers' Association of India (ISSAI), Mumbai, 2006

Table 2-2 Global ship dismantling activity

Country	No of Vessels	Sum of LDT	% of all Vessels	%of LDT
India	2,245	16,135,949	58	45
Bangladesh	529	7,737,562	14	22
China	379	4,794,533	10	13
Pakistan	192	3,521,888	5	10
Vietnam	29	372,882	1	1
Mexico	18	75,746	0	0
Turkey	109	379,641	3	1
Spain	18	59,439	0	0
Unknown	241	1,255,762	6	4
Total	**3,760**	**34,333,402**	**97**	**96**
Clarkson's total	3,877	35,681,405	100	100
Others	117	1,348,003	3	4

Source: Clarkson's Demolition Data[17]

Table 2-3 Ship breaking in million dead weight tonnage

Country	2001	2002	2003	2007	2008	2009
China	5.7	5.7	10.5	n.a.	n.a.	n.a.
India	7.9	10.8	8.7	0.5	1.9	2.5
Bangladesh	9.4	8.8	4.5	n.a.	n.a.	n.a.
Pakistan	3.7	1.7	1.3	n.a.	n.a.	n.a.
Others	1.1	1	1.2	n.a.	n.a.	n.a.
Total	27.8	28	26.2			

Source: Clarkson's in Steel Scrap Fortnightly, Iron Steel Scrap and Ship Breakers' Association

Table 2-4 Average price realization

Country	Average Price paid per LDT
Bangladesh	US $ 325
India	US $ 300
Pakistan	US $ 300
China	US $ 280

Source: Clarkson's Demolition Database, 2004

2.4.1 The cutting process

India and the other major ship breaking countries such as Pakistan, China, Bangladesh, Vietnam, Mexico, and Turkey follow the beaching method, rather than the more advanced dry dock method. In the beaching method, the ships come ashore at high tide; as the tide recedes, the beach becomes the work station. The

17 LDT/DWT ratio is 0.4

beaching method uses the beach and the tides as natural docks, and needs far less investment than a dry dock. The beaching method has become the standard practice. In Alang, key informants claim that the International Maritime Organization (IMO) recognized the beaching method of ship demolition as legitimate in its 2003 annual meeting.[18]

There is limited scope for fixed investments in ship breaking infrastructure except for better tools and machinery for safer, more efficient operations. Machinery has substituted manual labour to a considerable extent at Alang. Lift cranes and winch cranes are now abundant.[19] The Alang yard employed about 30,000 people in 2004, down from 40,000 in 2000.[20]

2.4.2 The Indian ship dismantling industry

More than 90 per cent of the ship dismantling in India is done at the Alang yard.[21] Its maximum capacity is about 4.58 million tonnes per year.[22]

The real boost to ship breaking in India came during 1994 when the economy was liberalized and imports were less restricted.[23] The Gujarat Maritime Board issued licenses for more than 100 plots for a period of 10 years, that is, until September 2004.[24] Only 72 plots existed until 1994.

After the economic liberalization measures in India in 1991 caused a jump in demand for steel, ship breaking in Gujarat offered a necessary addition to the semi finished products from the integrated steel producing plants. As ship breaking activity increased in India, the volume of scrap steel available grew, and the re-rolling mills that sprung up to use it posed direct competition to integrated steel plants.

In order to continue availing the port permit, the ship breaker has to break 10,000 tonnes at smaller plots, and 25,000 tons at sites with a minimum of 120 metres of waterfront.

The ship breaking industry is very cyclical in nature; therefore, calculated capacities are usually much higher than actual capacities. In times of economic boom, ship operators tend to retain ships in speculation of a higher profit later. In times of recession, owners tend to scrap ships; this becomes a boom time for ship breakers. Stiff competition among ship breaking nations is driving scrap prices down. It is estimated that Alang uses 60 per cent of its capacity at best and 43 per cent at lower levels of activity.[25]

Ship breaking offers direct employment for about 35,000 people. Table 2-5 shows the indirect employment in downstream industries.[26]

18 Field visit to Alang, 16th June, 2004.

19 Field visit, 2009

20 GMB Records

21 Indian Ship Breakers' Association

22 Status of the ship breaking industry in India, MECON Study, 1997

23 GMB Report on ship breaking, 2004

24 Status of the ship breaking industry, MECON Study

25 Interview with GMB officer

26 Statement published in local newspaper on behalf of Gujarat Ship Breakers' Association

Table 2-5 Downstream investment and employment

Industry	No of Units	Investment in million INR	Persons employed
Re-rolling mills	106	1590	12,000
Industrial gases	102	1020	2,000
Scrap processing	300	300	3,000
Sundry traders	2,000	5	6,000
Total		**2920**	**23,000**

Source: Gujarat Ship-breakers Association

2.4.3 Business versus detoxification of ships

Ship breaking is a global industry and behaves accordingly. The necessity of workers' safety and environmental protection are minor factors.

Compliance with ship breaking regulations increases costs and might affect business adversely. Also, certificates do not guarantee compliance, because none of the ship dismantling countries has an adequate monitoring mechanism. Genuine ship sellers find scrap yards' compliance records unreliable.

China and Bangladesh pay ship sellers more than India.[27] There seems to have been strong demand in China, and Bangladesh depends entirely on imported steel. In India, however, the domestic price trails the international price, and even more after the post-duty entitlement passbook scheme was withdrawn.[28] This severely reduced what Indian ship breakers could afford to pay. Ship breakers have incurred big losses following a 23 per cent drop in scrap price and a 39 per cent increase in ship price.[29, 30]

Table 2-6 Milestones in ship dismantling in India

Timeline	Milestone	Importance
1912	First ship breaking activity was reported in India near Garden Reach, Kolkata.	Beginning of ship breaking in India.
1983	First vessel *MV Kota Tenjong* was beached at Alang ship breaking yard	Beginning of largest ship breaking yard in the world.
1995	The issues of toxic import were reported by civil society groups and subsequently an NGO, the Research Foundation for Science, Technology and Natural Resource Policy filed a writ petition in Supreme Court via file no 657.	Beginning of judicial conflict on toxic waste handling.
1996	Issue of export of 'ghost' ships or MARAD[31] ships (formerly American navy) for scrapping in India was raised by NGOs.	Raised alarm that India will become dumping ground.
1997	The Supreme Court of India while hearing the case no 657, passed the interim order on hazardous waste.	All types of toxic waste were banned from being imported by an order of the Supreme Court of India.
1997	Protests by NGOs against the American government regarding possible export of 'ghost ships' to India for scrapping.	The American government put a moratorium on the export of ships to India because of wide criticism in the media.

27 *Op. cit.* 3

28 Sushmita Sengupta, calculation done at ERU Consulting, New Delhi; the post-duty entitlement passbook scheme (DEPB) allowed exporters to take credit for the duty paid on the import content of products exported

29 Dipping scrap prices render thousand jobless, yards barren, Economic Times, Delhi, 10th June

30 For increase in the prices of ships, see Steel Scrap Fortnightly, ISSAI, Mumbai

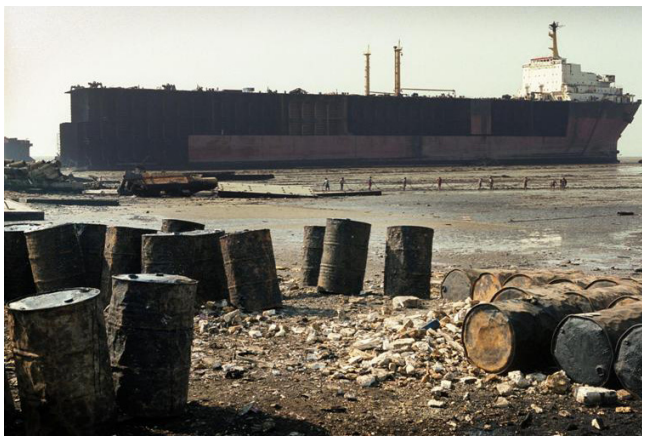
31 Maritime Administration, agency of American government.

1997-99	Greenpeace released studies of ship breaking yards and communicated the poor working condition in the yards internationally.	Ship breaking received substantial attention from media.
1997-98	MECON[32] was the first government agency to do a scientific study to check level of pollution and working conditions.	The study concluded that pollution problems were not serious, and was seen as approval for the authorities and ship breaking industry.
1999	Greenpeace again released fresh studies on ship breaking reiterating that the situation in Alang had not improved.	
1999-00	High Power Committee (HPC) formed by the direction of Supreme Court of India did a comprehensive study on Alang and gave various recommendations for consideration by the Supreme Court.	It became a launching pad for the 2009 Supreme Court order.
Around 2000	This led to several conventions and treaties by various UN bodies like IMO, ILO and Basel Convention.	Ship breaking got attention at International level, when UN bodies started discussing the situation.
2003	Gujarat Maritime Board rejected the beaching permission for a Norwegian ship *Hesperus* on the allegation made by Greenpeace on possible toxic import in violation of Basel Convention. This decision was reversed after one month.	
2003	The Supreme Court of India passed its final order while hearing the case no 657 accepting the recommendation from HPC and passed strong directions for ship breaking including prior informed consent, decontamination, and inventory of hazardous waste. The Supreme Court Monitoring Committee (SCMC) was formed to monitor the orders of court.	This ruling can be considered a landmark judgment.
2005	*RIKY* (original name *King Frederick IX* changed to avoid liability issues), a Danish ship, arrived in Alang 23rd April. Beaching permission was granted. However, the government made it clear that scrapping permission would be granted only with SCMC clearance; this was issued in June 2005. The ship was scrapped.	First time that an exporting country warned of a possibly illegal ship. The then environment minister A Raja wrote to the Danish environment minister stating the ship was found to comply with the law.
2006	French aircraft carrier Le Clemenceau started sailing to Alang for scrapping. Before it started its final journey, it was refused by Turkey, Spain and Greece. Before reaching Alang, the Supreme Court of India banned its entry in Indian waters. The then French president Jacques Chirac called back the ship after NGOs and trades unions alleged that decontamination of asbestos was not done.	This was the first incident where a state was involved in export of toxic ship and not a private company. This was also the first case when a ship for breaking was called back by its country of origin.
2006	SCMC disbanded. While discussing the issues of Le Clemenceau the SCMC was divided and submitted two reports to the court. One group was in favour of allowing the ship to proceed to India and another was against it.	The Supreme Court disbanded the SCMC and formed a new expert committee to look afresh into ship breaking.
2006	SS Norway or Blue Lady, a famous cruise liner, arrived in Alang for scrapping. The matter again got listed in Supreme Court for hearing. The SC declined to ban the ship because its expert committee report was still pending.	
2006-07	Expert committee submitted its report to Supreme Court.	It set the ground clear for new order by Supreme Court.
September 2009	Final order from Supreme Court.	The Supreme Court passed new order on for ship breaking detailing responsibilities on the part of stakeholders.
2009	American ship Platinum II or SS Oceanic arrived in Alang for scrapping.	

32 MECON Limited, formerly known as Metallurgical & Engineering Consultants (India) Limited is a public sector undertaking under the Ministry of Steel of the Government of India.

3 SHIP DISMANTLING AND ENVIRONMENTAL POLLUTION

Ship breaking is hazardous. End-of-life vessels often contain toxic materials like polychlorinated biphenyl (PCB), polyaromatic hydrocarbons (PAH), organotins like tributyl tin (TBT), polyvinyl chloride (PVC), which can produce toxic fumes on burning), tin, lead, heavy metals and various other substances such as sulphuric acid, halogens, and asbestos.[33] These items may be contained in the structure of ships or in the engines or may be stored as process chemicals. Therefore, ship dismantling may affect workers and the environment. Toxins mixed with sea water can adversely affect the health of marine life and ecology. They may also contaminate air and surface water and ultimately have a broader adverse impact on the ecosystem.



Civil society groups worldwide demand that developed countries stop disposing of hazardous waste in developing countries.[34] The US Maritime Administration (MARAD) sent defunct naval ships (called 'ghost ships') to India in 1997.[35] After protests over their environmental hazard, the US government stopped this export.[36]

33 Inventory of hazardous waste on end-of-life-vessels, Greenpeace, 2001

34 Steel and toxic waste for Asia, Ship for Scrap, Greenpeace, 1998

35 See various news items in media and Greenpeace website on ship breaking

36 Washington Post, 1997

3.1 ENVIRONMENTAL LAWS

Pollution control in ship breaking yards in India is mainly governed through:

1. Environment Protection Act, 1986
2. MSIHC and Chemical Accident Rules, 1989
3. Hazardous Waste Rules, 2002
4. GMB Rules on Ship Breaking, 2006
5. Factories Act, 1948

Under these rules, hazardous waste must be notified through prior information and the concerned authority must ensure full compliance to implement the process to avoid any kind of pollution. This policy purports to impose full safeguards on ships against the presence of chemical hazards. The Gas Free for Hot Work Certificate emerges from these rules, especially the ones that deal with chemical explosions and fire.

According to the Central Pollution Control Board of India (CPCB), mandated to regulate and monitor polluting emissions, the disposable waste a ship contains may not constitute more than 1 per cent of its weight. Of this, only 30 per cent can be hazardous and 70 per cent must be non-hazardous.[37]

The environment protection rules in Bangladesh and Pakistan are less stringent and, in practice, pollution is tolerated at least to a certain level. While India has more sophisticated laws, the implementation in all countries is poor. There seems to be a lack of coordination between the implementing authorities and vested interests are dominant.

3.2 SOURCE OF POLLUTION IN A SHIP

Several toxic materials may be found on ships, and at various places.

Asbestos: Asbestos is used as engine packing and insulation material in boilers and turbines and in water, steam, insulation, and refrigeration pipes. Although its use has been banned since 1986, there are still many ships with asbestos, and it is important to manage its hazards through regulations and by using the proper asbestos removal technology.

PCBs: They are usually found as anti-freezing agents and oils. The use of PCBs has been banned since 1975. India does not have the proper infrastructure to recycle PCBs.

PVC and PBBs: Plastics and constituents of plastics might produce hazardous fumes on burning. PBBs were listed as one of six controlled substances under the Restriction of Hazardous Substances Directive enacted into European law in February 2003.

37 GPCB and GMB report to Supreme Court of India

Other non-polymer chemicals: Commonly found in refrigerator ships but also in other ships, they are generally contained in turbines, air conditioners, and engines. They may also be found in lead acid batteries, resins, radioactive materials, and anti-rust paints, or paint stabilizers.

Organic pollution: Cow dung and other excreta often left in ships pose a health risk for workers.

Heavy metals: Found in batteries and paints, and in substantial quantities in the chemicals stored in ships.

Organotin: Used as an anti-fouling substance; banned since 1988.

Oil sludge: Produces hazardous polyaromatic hydrocarbon gases on evaporation. Hazardous for marine life if there is an oil spill.

Ballast and bilge water: This is water on the ship used to clean or wash out contaminated matter like lead from batteries and sulphuric acid from equipment. They leach through drains and into the soil.

Other non-hazardous solid waste: Broken ceramic tiles, wood pieces, expanded polystyrene packing, decorative and insulating material, cement, and other waste material litter ship breaking locations.

3.3 THE QUANTITY OF WASTE GENERATED IN SHIP BREAKING

In 1995, the Research Foundation for Science, Technology and Natural Resource Policy filed a written petition in the Supreme Court of India via file no 657 against the Union of India and others. Thereafter the Gujarat Maritime Board prepared a list of materials generated as waste from 348 ships demolished at Alang.[38] Table 3-1 presents the amount of waste in each ship.

Table 3-1 Generation of Hazardous Waste from Ships

Hazardous materials	Tonne per annum
Asbestos	175
Glass-wool	2,000
Rubber	40
Rexene	50
Plastics and cables	20
Sludge residue	800
Contaminated materials	200
Total	**3,355**

Data from GMB, 1996-97

Table 3-2 Generation of Non-Hazardous Waste from Ships

Non-hazardous	Tonne per Annum
Fibreglass	40
Iron scales	900
Cardboard and packing	35
Glass	175
Municipal solid waste for landfill	5,000
Cement tiles	10,000
Total	**16,150**

Data from GMB, 1996-97

38 Report of High Power Committee on Management of Hazardous Waste, September, 2000. http://nidm.gov.in/HPC/volume%5CStructure%20of%20HPC%20Report.pdf

According to the GMB, ship breaking generates about 1 per cent of tonnage broken as waste. A far higher percentage (almost 5 per cent) of hazardous waste was found from a pilot project conducted in Norway in 1999. Civil society groups also claim that generation of waste is much more than the 1 per cent figure that the GMB submitted to the High Power Committee of the Supreme Court. There is a tendency to compare the small ratio of hazardous waste to valuable materials and ignore the severity of the environmental problem from improper handling of even tiny quantities of hazardous waste.

Table 3-3 Total Hazardous waste in percentage of total tonnage

Grand Total Hazardous+ Non hazardous	19,505
Total tonnage broken	2,635,830
Average waste from ship	0.74 per cent

Data from GMB, 1996-97

3.4 TYPES OF ENVIRONMENTAL POLLUTION

There are several studies done by governments, NGOs, and international and bilateral agencies that indicate that waste from ship breaking may pollute sea water, increasing its turbidity, acidity, and salinity. This may impair the process of photosynthesis and decrease phytoplankton reproduction.

In 1997, the Ministry of Steel of the Government of India, which is in charge of ship breaking, commissioned the semi-government consultant MECON to conduct a scientific study of the environmental impact of ship breaking. In 1999, the High Power Committee, constituted by the Supreme Court of India in connection with a writ petition filed by an NGO, also did a scientific study along with the Central Pollution Control Board in the Alang ship breaking yard. The CPCB study was done in three different phases: pre-monsoon, monsoon, and post-monsoon. Another study was done by Greenpeace in 1998, 2000, 2003, and 2005.

3.4.1 Sea water quality

The issue of sea water quality remains inconclusive. The study conducted by MECON indicated that there was an increase in sea water turbidity at Alang as compared to Sosiya, therefore marine diversity was richer at nearby Sosiya, while the ship breaking activity is more concentrated in Alang. The study also found the deposits of all kind of heavy metals on the sea bed. The CPCB and Greenpeace studies also found heavy metal contamination of sediment.

However, the MECON study further concluded that the heterotrophic activity of colony bacteria[39] is higher at nearby Sosiya then Alang; hence, one could rule out the ecological danger due to ship breaking. Both the MECON and CPCB studies concluded that the sea water quality did not change due to ship breaking activity. Greenpeace, not convinced by the above study, conducted another study, which found a high concentration of tributyl tin, 19.4 µg/kg in sea water.[40] They claim that high concentrations of heavy metals were found in all the sediments tested.

39 Organisms that are incapable of photosynthesising and obtain certain organic compounds from other autotrophs

40 Steel and toxic waste for Asia, III, Greenpeace

Discussions with members of the local community furthermore indicate that 30 years of ship breaking have polluted the sea water at Alang and that the fish catch has declined.[41]

3.4.2 Soil quality

Neither the MECON study nor the CPCB one found serious pollution of soil due to ship breaking.[42] They both concluded that ship breaking does not change soil quality because it does not produce gaseous pollutants. Again, the Greenpeace study has completely different findings: the soil sample, for instance, was contaminated with polyaromatic hydrocarbons (PAHs) from the combustion process.[43] The PAHs contaminating the soil and sediment seem to come from different sources, such as leaked oil.

The practice of open burning of wastes, using oil as a fuel, observed during the visit to Alang, is likely to play an important role in PAHs found in the soil. This was also observed by the Supreme Court-appointed High Power Committee. While passing the Final Order, the Supreme Court of India mandated a complete ban on any kind of burning in the yards. Observation confirmed that the practice of open burning has decreased significantly (but not stopped completely).

3.4.3 Groundwater and surface water

The CPCB and MECON studies did not find any significant pollution of groundwater or surface water.[44] This may be because rainfall in Alang is light and leaching is not an issue. Besides, the sandy beach has a bed of hard rock which prevents the sea water from seeping into the ground water. However, sea water in the Gulf of Cambay flows into two rivers — Manar and Pasivivali — because of the tidal effect; if the sea water is polluted by the ship breaking activity, surface water might be polluted too.

A study by Professor HC Dube of the Department of Life Science at Bhavnagar University found changes in the groundwater quality in the villages near Alang and concluded that population growth and an increase in construction may have caused it.[45]

3.4.4 Air quality

The MECON study did not find any change in the air quality using active and passive sampling. It observed that though dust was found, no contaminating constituent such as asbestos was detected. However, the Greenpeace team observed that asbestos was found strewn casually around in the ship breaking plot and in open dumps, which could pollute the air and pose danger to workers.[46]

41 Discussion with local fisherman

42 MECON Study- status of ship breaking in India

43 Steel and Toxic Waste for Asia III, Greenpeace

44 MECON Study of Ship breaking yards in Alang

45 Prof. H.C. Dube survey of Alang ship breaking yards

46 Fact finding mission to Alang, Greenpeace, 1998

3.4.5 Flora and fauna

The MECON study did not find any changes in flora and fauna. The CPCB study did discover a slight change in flora and fauna but concluded that it was not due to ship breaking. Professor Dube found changes in the flora—the mangrove trees in coastal Alang have vanished.[47] However, the relation with ship dismantling is yet unclear.

3.4.6 Scientific studies in Bangladesh

Bangladesh has had very few scientific studies. A Det Norske Veritas (DNV) study is the most prominent and important. Sediment and sea water samples do not suggest a high level of contamination, but other samples tested like water, residue sample, asbestos, soil, paint and air contain high presence of different chemicals such as heavy metals, organotin, PCBs, and other chemicals.[48]

Young Power in Social Action (YPSA), an NGO based in Chittagong, published an environmental study conducted by Dr Md M Maruf Hossain and Mahmudul Islam.[49] The study was done to know the impact on the coastal zone of Chittagong, Bangladesh. The study concluded that the ship breaking activity pollutes the sea water environment in the coastal area of Fauzdarhat to Kumira in Chittagong. Because of toxic concentrations of ammonia, marine organisms found in sea water had increased pH levels. A high level of toxicity was found in both soil and sediment.

Besides this, it was observed that asbestos was being taken out by workers with their bare hands. The use of protective gear is not common. There is no dedicated decontamination site or landfill is operating near the ship breaking site in Bangladesh; wastes are dumped in the open.[50] However, the workers, common public, and other stakeholders hope for improvement in ship breaking yards in Bangladesh, especially after a new, very recent Supreme Court order.

3.5 SYNTHESIS OF STUDIES AND OBSERVATIONS

The MECON study cleared ship breaking of damaging the environment both on site and off site. However, in 2000, when the High Power Committee visited Alang, they observed that about 4,000 tonnes of waste was generated from 296 beached ships.[51] The HPC also observed that the methods of disposal were unauthorized and environmentally unsound. The ship breakers had no knowledge about the impact of hazardous waste. The house-keeping was poor and open burning of PVC and PCBs was found in several places.[52]

47 Prof. H. C. Dube survey of Alang ship breaking yards

48 Technical Report, DNV RN 590, Decommissioning of Ships - Environmental Standard, Bangladesh

49 YPSA: An environmental study in Chittagong ship breaking yard

50 YPSA report on ship breaking

51 Gujarat Maritime Board

52 Field visit by HPC & reporting from GMB

3.5.1 Observation at Alang

During a recent field visit, the following impressions were obtained.[53]

1. The yards looked dry and clean. All kind of wastes were collected and stacked in order in plastic bags. The garbage was segregated.
2. Asbestos was packed separately in plastic bags and stored near a garbage collection point.
3. The workers had protective gear but usage is just about 50 per cent; they say wearing protective gear in scorching heat and humidity is difficult.
4. The practice of open dumping has almost stopped, but still some wastes were found in open dumps, especially behind shops that sell second hand goods from the ships.
5. It seemed that burning of waste has stopped but some smoke was observed coming from the Sosiya ship breaking yard.
6. Some parts of ships were transported to Bhavnagar for further dismantling. The level of pollution in Bhavnagar city must be checked.
7. Other infrastructure like fire tenders have increased in capacity. The local offices of GPCB and GMB have more personnel to monitor the process of ship breaking.
8. Work at the landfill at Alang was observed as going on.

Although there were some positive changes observed in ship breaking yards, some orders given by Supreme Court of India were not implemented.[54]

1. No ships come with an inventory of hazardous waste on board.
2. Prior decontamination is not followed, and it seems that the GPCB issues the decontamination certificate based on the materials present in the cargo. No authority tries to look into the structure of ship to determine the quantity of waste.
3. Colour-coding water, gas, and oil pipes was not done by ship owners. This is a basic need of ship breakers to avoid accidents and explosions.
4. The physical infrastructure has improved, but environmental infrastructure is still not adequate. For example, there are no dedicated asbestos removal chambers or hazardous control site to detoxify the workers.
5. The merger of small plots into larger plot sizes has not yet been completed. An inter-ministerial committee (IMC) recommended bigger plot sizes for safer ship breaking.
6. The GMB has collected substantial amounts of money from ship breakers as fees, premia, and other charges but investment in facilities does not seem to be adequate yet.[55]

53 Field visit by researcher, 2009

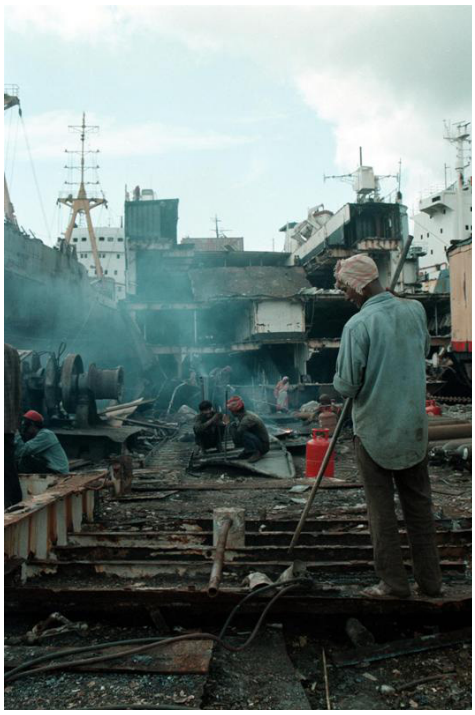
54 Field observation and interview with ship breaker and other by researcher, 2009

55 Researcher calculation based on the existing rate, fee and premium charged by GMB to Ship breakers

4 OCCUPATIONAL HEALTH AND LIVING CONDITIONS

The lack of proper definition and registration of ship owners lets them avoid legal consequences by passing on end-of-life-vessels through dummy ship owners. If there are problems, these ship owners cannot be traced; usually, they are registered as a post box company and have no proper address.

The yards employ, directly or indirectly, thousands of poor migrants who keep coming despite the dangerous and dirty conditions in ship breaking yards and poor living conditions. The present situation and developments regarding workers' safety and occupational health is examined in this chapter.



4.1 CIVIC AMENITIES

The workers take shelter in makeshift arrangements made out of plywood taken out of the ships. Often, there is no sanitation or safe drinking water supply. Drainage facilities are missing and mosquitoes breed in the stagnant water. Difficult work and living conditions turn many workers to alcohol and gambling. The workers are prone to lung and chest infection, tuberculosis, dysentery, diarrhoea, malaria, cholera, and common fever.[56] These diseases are common in India's slums and villages; however, it is important to study what can be considered specific occupational health risks of the workers at the ship dismantling sites.

56 Interview with the doctor in mobile medical van

Creation of housing facilities for workers is in a deadlock.[57] While the Gujarat Ship Breakers' Association is in favour of providing housing facilities to workers, the Iron and Steel Scrap and Ship Breakers' Association of India (ISSAI) seems to have objections. The ISSAI wants the GMB to provide housing facility with funds from the fees collected from ship breakers,[58] but due to unknown reasons, the issue is stuck with its Ferrous Scrap Committee. Based on an order following a public interest litigation suit, the Mumbai High Court in 1997 summoned a ship breaker to provide housing to workers. The ship breakers led by the ISSAI challenged this order in the Supreme Court and the judgement is still awaited.[59]

In Bangladesh workers are expected to make their own housing arrangements.[60]

4.2 HAZARDS OF WORK AT THE YARDS

The physical hazards associated with ship breaking are very high. About 20 per cent of workers are on the ship at any time.[61] Most workers in India have been provided protective gear but practices and enforcement is not strong enough. The biggest causes of accidents are fire and chemical explosions. The other causes of major accidents are falling objects and people slipping due to oil leakages.

Table 4-1 Number of deaths on ships at Alang[62]

Year	Number of Deaths	Million Tonnes Broken	Number of Ships
1991	10	0.54	85
1992	12	0.94	137
1993	16	1.26	175
1994	28	2.17	301
1995	29	1.25	183
1996	28	2.64	348
1997	51	2.45	347
1998	27	3.04	361
1999	29	2.75	296
2000	28	1.93	295
2001	16	2.73	333
2002	12	2.42	300
2003	24	1.99	294
2004	5	1	196
2005	16	0.5	101
2006	5	0.8	136
2007	12	0.6	36

Source: Office of Senior Inspector of Factories, Alang, Dist. Bhavnagar

57 Status of ship breaking in India- Ministry of Steel

58 Fee and premium collected from ship breaker in last 25 years

59 Gujarat Maritime Board Record, 2004

60 Various reports from Bangladesh in news media

61 GMB calculation on labour force

62 Gujarat Maritime Board Record, 2004

The number of deaths in 2007 is less than reported by other sources, for example, the DIVEST project. A possible explanation for this discrepancy may be that seriously injured workers may not have been treated in the local hospital but at better equipped hospitals, for example, in Bhavnagar.

Table 4-2 Causes of Death at Alang ship breaking yard 1991-2000[63]

Causes of Death	No of Deaths
Lifting Machinery	12
Transport machinery	1
Explosion	16
Fire	44
Gassing	28
Struck by falling objects	48
Persons falling from heights	56
Fall on floor	10
Falling on pits and dumps	2
Striking against objects	30
Handling Goods	6
Others	4
Total Deaths	**257**

Mostly, workers slip and fall to their death or are killed by falling objects; yet, the ships are never cleaned before they are cut. No worker wore climbing gear in the yards.

The Directorate General, Factory Advice Service has reported that goods are stacked improperly in the yards.[64] The cutting plan is improper; a major fire broke out while a ship was being cut last year and killed six workers.[65] The workers have demanded a judicial probe and have also written a letter to the Chief Justice of the Gujarat High Court. The preliminary report submitted by the GMB concludes that negligence by ship breakers was the reason for this fire.[66] Ms Vidyut Joshi similarly concluded that ship breakers pay insufficient attention to safety.[67] At present the situation has improved somewhat, but especially the ship cutting plans were still found inadequate.[68]

Table 4-3 Fire Related Accidents

Year	No of incidents	Deaths	Injuries
1999-00	60	31	34
2000-01	18	16	8
2001-02	23	12	18
2002-03	41	24	8
2003-04	16	21	10
2004-05	12	5	11
2005-06	21	16	12
2006-07	10	3	9
2007-08	8	2	10

Source- Department of the Senior Inspector of Factories, Alang, District Bhavnagar

63 Office of Senior Inspector of Factories, Alang, Dist. Bhavnagar

64 Model Ship Breaking Yard- A study report, Roy Choudhari, Directorate General Factory Advice Service, Central Labour Institute, Sion Mumbai, 2001

65 http://www.expressindia.com/latest-news/alang-fire-incident-workers-union-demands-judicial-probe/500466/

66 Preliminary report on fire by GMB under the chairmanship of Capt. S.C. Mathur

67 Industry Safety, paper prepared by University of Bhavnagar

68 Field Visit during research, September, 2009

4.3 BANGLADESH WORKERS SAFETY

Workers in Bangladesh (and Pakistan) are at even higher risk. Facilities and protective gear in these countries are insufficient. Accidents and explosions in Bangladesh are not reported properly. The Government of Bangladesh has no statistics or reliable records on ship breaking yards, and yard owners are reluctant to give any information.[69] The news spreads only when an explosion on a shipwreck is big enough to alert local journalists and outside observers such as NGOs. In those cases the authorities investigate the case, and urge ship breakers to improve the conditions. For example, after an explosion on the tanker *TT Dina* in May 2000 that killed 12 workers[70], promises were made by the Bangladesh Ship Breakers' Association to build a hospital, which has not materialised.

About 40 people die in explosions and fires every year at the Chittagong ship breaking yard.[71] A total of about 400 deaths and 6,000 injuries have occurred there.[72]

4.4 IMPROVEMENTS OF WORKING CONDITIONS

4.4.1 Education and awareness relating to protective gear

The workers in ship breaking yards in South Asia are migrants and mostly uneducated and illiterate. In India, the workers have mostly migrated from Bihar, Orissa, West Bengal and Uttar Pradesh.[73] It is interesting to note that the local population is involved only in trade; migrant workers do all the cutting and loading and manual work at the yards.

The GMB established a training centre in 2005 that conducts training and orientation programmes on hazardous waste management and making a proper ship cutting plan. This initiative is popular among the workers.

Despite the education and awareness drive by the GMB, workers do not wear proper protective gear, either because they do not have it or because of comfort and cultural impediments. Workers indicated that heat and humidity makes wearing gear difficult. It seems that the GMB and ship breakers have to procure protective gear appropriate to the local climate.

69 The Human Cost of Ship Breaking – an investigation in Bangladesh - Greenpeace

70 Fact finding report by YPSA

71 Report by YPSA on Chittagong ship breaking yard, 2005

72 YPSA fact finding report on Chittagong ship breaking yard

73 GMB records on workers

4.4.2 Wages, compensation and working hours

Indian ship breaking yards work eight hours a day (night work has stopped completely).[74] In Bangladesh yards work round the clock.[75] Workers' wages are low, and compensation in the case of death is small.[76] There are no insurance plans.

In India, workers are paid better. A cutter receives about INR 300 a day, a loader about INR 250 a day, and a crane operator can charge INR 1,200-1,500 a day. [77] The workers in Alang also have an insurance plan, which was made mandatory for yard owners by the GMB. Workers find claiming their insurance difficult, although this may be because of their lack of awareness.

4.4.3 Medical facilities

The high number of accidents and explosions necessitate a well equipped hospital nearby. The Alang ship breaking yard has only a very small hospital, operated by the Red Cross. That hospital urgently needs improvement. The seriously injured are shifted to a hospital in Bhavnagar. It is about 50 km away; some seriously injured may not make it alive.

A hospital was built by a trust in 2005.[78] The Gujarat state government has directed the GMB to run the hospital.[79] In 2005, the state government also decided to upgrade the existing Red Cross hospital. Since then, the matter is pending. Even the chairman of the Inter-Ministerial Committee (IMC), appointed by the Supreme Court to monitor the court order, has expressed its deep concern on significant delay by GMB to start the hospital.[80] The GMB has promised the IMC to look into the matter.[81]

In Bangladesh, there are no proper hospitals or dispensaries near the yards. All serious cases are referred to hospitals in nearby towns.

4.4.4 Child labour

In Bangladesh, most poor families are dependent on child labour. Children make up over 10 per cent of the labour force.[82] The ship breakers in Bangladesh prefer to recruit children as they are less expensive. No child labourer has been found in Alang, and it is unlikely that child labour is taking place off the ship breaking yard, although there may be some in allied activities.

74 International Regulation of Ship Breaking, James Johnson, Leiden University, Netherlands, 2003

75 YPSA report on Chittagong ship breaking yards

76 YPSA report on Chittagong ship breaking yards

77 Focus group discussion with workers, September, 2009

78 A public trust was formed by the order of Gujarat High Court and each ship breaker donated INR 100,000 each for building and other facility. The trust is headed by a retired judge of Gujarat High Court

79 GMB statement to IMC in 2005

80 IMC meeting of 2009

81 GMB submission to IMC in 2009

82 YPSA baseline survey of ship breaking yard, 2003

4.4.5 HIV/AIDS

The Alang AIDS centre reports a serious and growing incidence of HIV/AIDS infection. Migrant workers there live away from their families, and some visit prostitutes. Social workers say that the workers, who work in several industrial sites, bring the disease from other places as well.

4.4.6 Workers' organisation

There is no trade union in India or Bangladesh. The ship breakers discourage any such activity. Occasionally, workers' protests are instigated by the ship breakers when they are under pressure, such as during the Clemenceau controversy against Greenpeace in 2006.

Table 4-4 Analysis of different facilities at ship breaking yards across South Asia

Facilities	India	Bangladesh	Pakistan
Provision of personal protective equipment	Yes, mandatory	Not mandatory	No
Training program on hazardous waste	Yes, a dedicated training building	No	No
Working hours	Eight hour	Round the clock	No information
Hospital	Small hospital, new hospitals not operational.	No	No
Drinking water	Tap supply in yards	No	No
Housing	No	No	No
Insurance	Yes, mandatory	No	No information
Medical check-up	Once in a month	No	No information
Fire tenders	Yes, but not enough	Not clear	No information
Sanitation facility	No	No	No information
Waste disposal	Three landfills	No	No

Source- Gujarat maritime Board, YPSA baseline Survey and Field Observation

5 INTERNATIONAL LEGAL FRAMEWORK AS RELEVANT TO SOUTH ASIA

Ships that come for demolition pose several hazards to workers' lives. Both residents and migrant workers are exposed to the chemicals present in ships. Decontamination, a pre-condition set by the Supreme Court of India for dismantling permission,[83] does not happen in practice.

An international regulatory framework on ship dismantling is being developed by the International Maritime Organization, Basel Convention, and the International Labour Organization (ILO). To promote cooperation among parties in the international trade of certain hazardous chemicals to protect human health and the environment, the principle of 'prior informed consent' was adopted as a shared responsibility on 10th September 1998 by a conference of parties in Rotterdam, the Netherlands as a prelude to the 2004 Rotterdam Convention.[84] The convention creates legally binding obligations for the implementation of procedures. The discussion at the United Nations has been in progress for seven years, but no conclusion has been reached as yet.

No significant improvement has occurred as a result of international initiatives, because

- the actions are non-binding;

83 The Supreme Court of India order on Ship breaking, October, 2003

84 Prior informed consent is a shared responsibility under the Rotterdam Convention, the Netherlands, The convention entered into force in 2004.

- the 'playing field' is not level; and
- ship dismantling countries are not united since they have different interests.[85]

5.1 EARLY CONVENTIONS RELEVANT TO SHIP DISMANTLING

There are two important conventions relating to ships and their waste.

MARPOL This convention rules against oily discharge, and should apply to ship breaking yards in South Asia as they discharge oil and other greasy materials. It also requires the ship owner to pay for cleaning up the pollution from his ship.[86]

The London Convention It states that the flag state (the nation in which a ship is registered) should be held legally responsible for providing information related to scrap to ship owners before they send vessels for dismantling.[87] The country of the ship breaking yard would inspect this information before permitting beaching. By the Polluter Pays principle, the ship owner and the exporting country are directly responsible for any kind of pollution and must pay the clean-up cost.

5.2 BASEL CONVENTION

The 2004 Basel Convention is the most important convention for end-of-life vessels, following the 2002 technical guidelines on ship breaking.[88] The Basel Convention has been ratified by 172 state parties, including India and Bangladesh.[89]

The Basel Convention aims to protect human health and the environment against hazards that may result from generation, trans-boundary movement, and management of hazardous waste. It has two main pillars:

- a control system for any movement of hazardous waste and therefore reduction of such waste; and
- environmentally sound management of wastes, therefore minimised waste generation.

Ship owners are obligated to request the authorities for permission to scrap a ship. The obligation includes prior informed consent and determining that the scrapping yard complies with all Basel Convention guidelines.

Many ship owners have requested the IMO to prepare its own guidelines.

85 For example, unilateral measures taken by India not to allow any tankers if they do not carry the Gas Free for Hot Work certificate' led to diversion of business to Bangladesh. End of Life Ships- The Human Cost of Ship Breaking, Greenpeace

86 End of Life Ships -The Human Cost of Ship Breaking, Greenpeace

87 Marine Pollution, The International Convention for the Prevention of Pollution of Sea by oil and other materials.

88 The 6th Meeting of the conference of Parties to the Basel Convention adopted the technical guidelines for the environmentally sound management of ship breaking

89 www.basel.int

5.3 INTERNATIONAL CHAMBER OF SHIPPING

The International Chamber of Shipping established an Industry Code of Conduct in 1999 in light of the growing concern for environmental pollution, which proposed that three kinds of inventory be maintained for every ship and handed over to the ship breaker.

The three kinds of inventory proposed were of

1. materials that are part of the ship's structure,
2. parts held as storage and spares, and
3. substances used in the final journey, such as oil and wastes.

This was seen by shipping companies as a novel and good initiative. It was hoped that there would be fewer accidents and explosions in ship breaking yards as the yard manager would be better prepared with an inventory of hazardous wastes on board.

However, no proper inventory has been shared with ship breakers anywhere so far.

5.4 INTERNATIONAL MARITIME ORGANIZATION

The 166-party International Maritime Organization regulates global shipping matters. It has been working on ship breaking since 1999. In 2003, the IMO adopted new, voluntary guidelines on ship recycling.[90] The guidelines give directions on making a ship recycling plan and also on the concept of a 'Green Passport'.[91] However, none of its recommendations has been implemented.

The IMO decided to develop a new, mandatory, global ship breaking regime in its 24th Session in December 2005. The IMO Convention that adopted in May 2009 in Hong Kong is an achievement as such but it still lacks important elements of the 'Polluter Pays' principle, waste prevention, and other elements of environmentally sound management.

Besides, the new regime allows the beaching method. Using it in the soft beaches in India, Bangladesh, and Pakistan would be unsafe; dry-dock ship dismantling would be sustainable instead.

5.5 INTERNATIONAL LABOUR ORGANIZATION

The International Labour Organization (ILO) also adopted ship breaking guidelines in 2003.[92] These guidelines aim at protecting workers from hazards and preventing

90 IMO guidelines on ship recycling adopted in December 2003

91 The Green Passport of a ship is an inventory of hazards.

92 Safety and Health in Ship Breaking; Guidelines for Asian Countries and Turkey was adopted at a tripartite meeting in October 2003

work-related injuries and incidents. The ILO cannot force guidelines upon countries. The guidelines aim to assist local authorities in establishing the respective duties and responsibilities of the authorities, employer, and workers and in enabling them to cooperate.

Besides this, a number of other conventions and treaties under the banner of the ILO are important for ship breaking countries:

- C 87, Freedom of Association and Protection of the Right to Organise Convention, 1948 (ratified by India and Bangladesh)
- C 98, Rights to Organise and Collective Bargaining Convention, 1949 (ratified by India and Bangladesh)
- C1, Hours of Work (Industry), 1919 (ratified by India and Bangladesh)
- C 18, Workman's Compensation Conventions, 1925 and 1934 (ratified by India and Bangladesh)

5.6 JOINT WORKING GROUP

The Basel Convention, ILO, and the IMO formed a Joint Working Group (JWG) to formulate better conditions in the scrapping yard. It met first in February 2005. A conclusion is expected soon.[93]

5.7 LOOPHOLES IN INTERNATIONAL REGULATIONS

Despite all the above agreements, ships are not cleaned before they are sent for scrapping. This liability is avoided by transferring ownership to a non-accountable intermediate buyer (or dummy), through which liability is avoided.

If regulations prevent a ship from being beached at the yard, the cost of floating the ship is high. In addition, the intermediate buyers have deposited around 10-15 per cent of the value of ship in cash into an escrow account opened jointly by them and the scrap buyer. Owners sink the ship and recover the cost through insurance in case of such obstructions sometimes.

5.8 EUROPEAN UNION

In 2008, 456 vessels were demolished out of which 177 (39 per cent) were under European flags or belonged to ship owners established in the European Union or to members of the European Free Trade Association.[94] The European Commission (EC) has started its own process in improving the situation regarding ship dismantling.[95]

93 Website of the Basel Convention on ship dismantling: http://www.basel.int/ships/index.html

94 Safety and Health in Ship Breaking; Guidelines for Asian Countries and Turkey was adopted in tripartite meeting in October, 2003

95 Website of European Commission on ship dismantling: http://ec.europa.eu/environment/waste/ships

A Green Paper and a communication proposing an EU Strategy on better ship dismantling have been adopted in 2007 and 2008.[96]

5.9 INDIA'S POSITION AND DEMANDS

The Ministry of Shipping (the nodal agency with the IMO) has submitted that the IMO

- insist on registration of the flag state and the country where the owner is located (for accountability);
- rule original owners of ships responsible for cleaning ships and prosecute intermediate buyers and 'dummy' owners; and
- rule that ship owners clean their ships and/or have toxic materials replaced with safe alternatives when ships undergo repair or maintenance.

96 They are available on this website: http://ec.europa.eu/environment/waste/ships/index.htm

6 CONCLUSIONS AND RECOMMENDATION

India and Bangladesh are the world's largest ship breaking countries. Pakistan is in terminal decline.

In India, ship breaking is a cyclical and speculative business. To avoid environmental and other liabilities, ship owners register ships in other countries and involve an intermediary (or dummy) ship owner just before the ship goes to the yard.

Bangladesh, with its high demand for steel, pays more for ships. Most oil tankers are sent there for scrapping for this reason. It seems to obtain this competitive edge by scrimping on environmental protection and workers' safety. Local and international NGOs have called for improvements in the ship breaking yard near Chittagong. The Government of Bangladesh has launched a programme on ship breaking supported by the UNDP and ILO. However, real improvement may be elusive—the powerful business-government nexus has an interest in maintaining the status quo.

Environmental protection and workers' safety are matters of great concern. Sea water, soil, ground and surface water, and air are all being polluted; however, the research community is divided on its severity. Casualties at the yards, mostly due to fires and falls, are declining in India but are still high, and not all cases may be reported. There is little data on occupational health and morbidity. For Bangladesh there is no reliable data.

Environment and labour are subject to regulation at different levels. On the local level, the multitude of bureaucratic instruments and agencies makes it cumbersome for the

ship breaking sector to obtain timely permission, even if they comply. Usually, ship breakers work illegally around the regulations. In Bangladesh, regulation is weak and implementation even weaker.

Nevertheless, and particularly in India, there are some positive changes, attributable to its Supreme Court's strong insistence on improvement, in the use of protective gear, education and awareness, remuneration, working hours, water supply, lighting, and basic infrastructure. Other issues remain bad and unchanged, such as housing for workers in shanties, sanitation, health care, and educational facilities. The environmental infrastructure has improved somewhat, but is still far from adequate; for example, removal chambers for asbestos are not available, and an engineered landfill site at Alang is still under construction.

Exporting countries and ship owners frequently ignore international conventions, agreements, and guidelines. For international cooperation to have an impact, exporting countries, especially the European Union and the United States of America, should ensure that ships are decontaminated, there is an inventory of hazardous substances, and that ships' ownership and origin are not manipulated.

Ship dismantling policy in South Asia requires the following actions at the international, national, and local levels.

International level and source countries

- The International Maritime Organization and other stakeholders should implement and develop arrangements under various agreements
- Ensure better tracking of ships, including transparency of the source country and ownership
- Effectuate the requirement of inventories of materials used in ship construction
- Assist recipient countries in upgrading dismantling yards and regulatory framework
- Encourage recipient countries to create a 'level playing field' in terms of environmental regulations and labour conditions to avoid unfair competition
- Discourage ship dismantling at locations with substandard environmental protection and poor workers' safety

National governments (recipient countries)

- Negotiate a 'level playing field' between recipient countries (such as India and Bangladesh)
- Formulate a multi-sectoral policy and strategy to promote better practices in ship dismantling and work towards common objectives
- Monitor the status and implementation of laws
- Promote unbiased research on the working conditions at yards and the environmental impact of ship breaking
- Facilitate transparency and civil society involvement
- Help ship breaking yards upgrade facilities

Local Governments

- Rationalize and integrate permits to promote compliance
- Use revenue from permits for development and infrastructure
- Persuade industry that sustainability development makes ‘business sense’ and reduces risks related to controversy
- Facilitate transparency and civil society involvement

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EU-INDIA ACTION PLAN SUPPORT FACILITY – ENVIRONMENT

This project is funded by the European Union and implemented by a consortium led by Euroconsult Mott MacDonald, Arnhem, the Netherlands. The activity on ship dismantling has been implemented in collaboration with WWF-India.

The Ministry of Environment and Forests represents the Government of India as counterpart to the EU for the implementation of the project.

The project implementation period is from December 2007 until April 2011.

The objectives are:

- Improved sector policy analysis and knowledge
- Enhanced mutual understanding and cooperational links and dialogue
- Enhanced regulatory function and improved technical and institutional capacity of the Indian administration
- Enhanced dialogue, information exchange and awareness among civil society's organisations

The areas covered by the project are waste, chemicals, water, air, and climate change.

Project activities to develop the policy dialogue between India and the EU include advisory services, workshops, seminars, training, studies, and capacity building.

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