

MARITIME POLLUTION AND THE SHIPBREAKING INDUSTRY — CHALLENGES AND MITIGATION-OPTIONS

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Given the temptation of South Asian governmental bureaucracies to view the shipbuilding industry solely in economic terms and as a generator of employment, this article seeks to draw the attention of lay readers and government officials alike to the strengths and infirmities of the legal framework that regulates (or should regulate) the shipbreaking industry, with especial emphasis upon the environmental pollution that this industry causes.

A ship has a lifespan of about 20-25 years before it starts to deteriorate (largely due to corrosion) and is rendered uneconomical to operate¹. Once this stage is reached, the ship is usually sold for scrap and towed to a shipbreaking yard, where it is comprehensively dismantled. Dismantling ships for re-sale and the re-use of and/or extraction of raw materials that go into the making of a ship is commonly known as shipbreaking. It is also known as ship-dismantling or ship-recycling. Shipbreaking is an enterprise of substantial magnitude. As the International Labour Organisation (ILO) points out, “the average number of large ships being scrapped each year is about 500-700, but taking into account vessels of all sizes this number may be as high as 3,000”². Ninety per cent of shipbreaking in the world is carried out in Bangladesh, India, China, Pakistan and Turkey, in that order.³

Shipbreaking is predominantly a labour-intensive activity. For instance, a small merchant ship of, say, 40,000 deadweight tonnes (DWT), requires about 50 labourers working on it for some three to five months.⁴ At the shipbreaking yard, the metal plates that were once welded together to make up the ship’s hull, decks, cargo-holds/tanks and superstructure are now subjected to acetylene cutting-torches and are broken-up into sizes that can be loaded onto trucks and then sold as scrap metal. The ships are gutted as if they were huge metal fish, and the many kilometres of power cables that every ship is provided with are removed. So, too, are assorted fittings such as chain cables, anchors, davits, cleats, bollards, fairleads, assorted ropes and mooring hawsers made of metal wire or manmade fibres, electrical and mechanical devices and fixtures, wooden and metal furniture, and even sludge (a mixture of residual fuel, water, lubricants, and dirt). All these, and many others besides, are recovered and then either sold to generator local scrap-dealers for resale, or simply disposed-off in the most convenient waste

¹ Ship Breaking: a hazardous work, International Labour Organization.
https://www.ilo.org/safework/info/WCMS_110335/lang-en/index.htm

² *Ibid*

³ *Ibid*

⁴ Peter Gwin, “The Ship-Breakers”, National Geographic Magazine, May 2014,
<https://www.nationalgeographic.com/magazine/article/The-Ship-Breakers>

stream. Shipbreaking is considered to be one of the most dangerous of industries, not only for the workers themselves but also for the environment. The entire process is extremely challenging due to the sheer size of the ships, the complexity of the process, and the corresponding environmental obligations that go along with it. Clear evidence of the lure of profit, howsoever made, is to be seen in the manner that several shipping companies have successfully evaded rules and regulations designed to make the business of shipbreaking environmentally sustainable, by simply moving their operations to places that would enable them to avoid rising labour costs consequent upon the compulsory institution by Western countries of health and safety norms at work places, which then require companies to bear additional taxes and regulatory burdens. Until the 1970s, ships were mainly dismantled in Europe and in the USA⁵, but over the past forty odd years, the industry has largely relocated itself to Asia in general and South Asia in particular. One of the more well-known reasons for this concentration of shipbreaking in the South Asian segment of what is often called the ‘Global South’⁶ is, of course, lower manpower costs. Another is that *“India, Bangladesh and Pakistan, by virtue of their naturally favourable tidal conditions, are able to use the beaching technique for ship breaking which is less capital intensive and hence more cost effective in comparison to the advanced dry dock method”*.⁷ Of note, however, are other (and darker) reasons such as the relatively weak environmental laws, and even weaker implementation, as also far less developed health regulations, as compared to countries of the Global North.

The shipbreaking challenge, therefore, for a country such as India, is that of being able to strike an optimal balance between four major factors: (1) retaining comparative geo-economic advantage; (2) sustaining and increasing employment opportunities; (3) maximising human health and safety; and, (4) minimising adverse environmental and ecological impacts.

One of the world’s largest shipbreaking yard is the Alang-Sisoya Yard in Gujarat, which oversees approximately 50% of the world’s ship dismantling. Close to 90% of ships that are brought or sent to India for recycling end-up here.⁸ In 2019 alone, India dismantled 200 ships in Alang.⁹ All kinds of vessels like oil-gas tankers, box ships, bulk cargo ships, Roll-on-Roll-off cargo vessels (such as car ferries), passenger liners, and a wide variety of warships from India and abroad are dismantled here. Rather than being docked (as used to be the case in the US and Europe), these vessels are beached during high tide and the workers get to dismantling once the tide recedes.

During the process of dismantling, a huge volume of hazardous substances, including paint, heavy-metals and fire-fighting chemicals, leach into the soil and the foliage in the vicinity of the

⁵ Sara Costa and Geetanjoy Sahu, “The Ship Recycling Industry Must Move Towards a Sustainable Future” In *The Wire*, 03 August 2020, <https://thewire.in/environment/shipbreaking-ship-recycling-industry-sustainable-future-environment>

⁶ Lina Benabdallah, Carlos Murillo-Zamora and Victor Adetula, “Global South Perspectives on International Relations Theory”, in *International Relations Theory*, (Eds Stephen McGlinchey, Rosie Walters and Christian Scheinpflug), November 2017, <https://www.e-ir.info/2017/11/19/global-south-perspectives-on-international-relations-theory/>

⁷ Soma Basu, “South Asia: World’s Ship Scrapping Yard”, *Down to Earth*, <https://www.downtoearth.org.in/news/south-asia-worlds-ship-scrapping-yard--40995>

⁸ “Alang ship recycling yard”, last accessed Feb 11, 2021, http://www.alanginfo.com/about_us.aspx?id=

⁹ “The Toxic Tide”, 2019 ship breaking records, NGO Shipbreaking Platform, <https://www.offthebeach.org/2019/>

shipbreaking yard due to spillage. The metal and other forms of scrap have high concentrations of oxygen-depleting substances (ODS) that are retained in the material when it is carried off the yard and sent away for re-sale, and, because of this, there are far reaching effects of the activity.

In the year 2010, a study conducted on soil samples from shipbreaking yards in Bangladesh and Pakistan revealed dangerous levels of cadmium, chromium, lead and mercury.¹⁰ These materials enter the water stream and alter the physiochemical and biochemical properties of the entire coastal locale. Some of the crucial pollutants identified in this study included:

- **PCBs (polychlorinated biphenyls):** These exist in both, solid and liquid forms, and are one of the primary substances contained in the cables of old vessels and new vessels alike. Their production was banned in 1979 because of how difficult it was to safely dispose them of. However, by the time the ban was brought into place, the US had already manufactured 1.5 million pounds (680388.555 kg) and these substances are, therefore, found in a lot of ships that were built in and around that period. This is one of the main areas for concern as PCBs tends to leach into the soil and contaminate ground water. Reports from 2019 state that almost 69% of PCB concentration was observed in the city of Mumbai due to the port's activities, mainly shipbreaking that was occurring along the coast.¹¹ Long-term exposure to PCBs can cause liver damage, neurological damage, reproductive impairments, and cancer.¹²
- **Bilge and Ballast Water:** Stagnant, contaminated water and other liquids in the form of condensed steam, and valve leaks are allowed to drain the lowest spaces of a ship's, which are known as "bilges". Both bilge- and ballast-water contain high concentrations of heavy metals that cannot be easily removed. More often than not, this water is just expelled from the bottom of the ship onto the beach area where it either enters the ocean or stays on the beach where it is constantly in contact with the workers. When these enter the ecosystem and the human food chain, they cause lead poisoning, anaemia, liver damage and cancer.
- **Oils and Oily Water:** Large amounts of oils and oily water are expelled from vessels during the dismantling. This oil remains on the beach and continues to choke the surface. During high tide, this oil is then swept into the water, cleaning the beach but polluting the ocean. The human and marine world is dealing with the ghastly effects of oil spills that are occurring in different water bodies and this is yet another major contributing factor.

¹⁰ Ship breaking and recycling industry in Bangladesh and Pakistan, Dec 2010, The World Bank.

¹¹ Subhojit Goswami, Feb 26, 2017, Down To Earth.

<https://www.downtoearth.org.in/news/environment/chennai-s-soil-and-delhi-s-air-most-contaminated-due-to-pcb-concentration-study-57217>

¹² MM Hossain, and MM Islam, "An EIA case study on the abundance and species composition of fish species in and around Ship breaking area," in the coastal area of Chittagong, Bangladesh. Institute of Marine Sciences, University of Chittagong, 2004, pp. 34

- **Other substances:** While the aforementioned substances are primary culprits, there are several other toxic materials released as a consequence of shipbreaking. Electric batteries that are stacked in the vessel tend to leak because of rough handling. Sulphuric acid is present in large quantities on a vessel and can be very dangerous when handled without enough precaution. Highly inflammable paints and preservatives are found on the inner and outer surfaces of the ship. Chemical substances are used to remove them and it converts the heavy metals (lead, cadmium and mercury) into fine dust which settles on the clothes and skin of the workers and on the beaches. Dioxins are produced when cables are burnt to obtain copper and the particles get suspended in the air. Oxygen-depleting substances like CFCs and HCFCs are released into the atmosphere. Asbestos exists in masses naturally but when the workers dismantle the pieces they disturb the natural state and make the asbestos air-borne. Once it enters the human respiratory system, it forms scar-tissue in the lungs and decreases the blood supply, which in turn causes the heart to enlarge. Sixteen percent of the workers at the Alang-Sisoya shipyard in Gujarat are suffering from asbestosis. An average sized ship contains up to 7 tonnes of asbestos which is often sold in the local communities after scrapping.¹³ Equally hazardous are the radioactive chemicals that are extensively used on ships for liquid-level indicators, smoke detectors and glow signs, which may well be along at low levels, but aggregate to dangerous ones with the steady corrosion endemic to ships that lie “between wind and water” for protracted periods of time. This indirect creation and informal disposal of hazardous substances routinely occurs in shipbreaking yards and the improper handling of these materials can have disastrous effects upon humans, the environment and the ecology.

If all this were not problematic enough, the location of the shipbreaking yards make them particularly susceptible to the effects of climate change. With rising ocean and tide levels submerging a larger area of beach- and coastal areas, there is a sharply increased scope for accumulated pollutants to be washed out to sea. A single storm or even a higher than usual tide is more than enough. This redistribution of metals, pollutants and hazardous substances from the sandy area to the ocean resources has even wider repercussions because it enters the human ecosystem by way of consumption of seafood. Such pollution will continue to add pressure on the fishing, prawns and shrimp industry as well. There are simply too many problems that occur as by-products of the shipbreaking industry for it to be perceived solely through an economic lens.

One obvious solution to several, if not all these problems, is to relocate the shipbreaking yards themselves. However, there are a number operational and economic challenges attached to any such endeavour.

¹³ **Safety and Health at Work:** A Vision for Sustainable Prevention, International Labour Organization 2014
https://www.ilo.org/wcmsp5/groups/public/@ed_protect/@protrav/@safework/documents/publication/wcms_301214.pdf

In 2019, a Bangladeshi NGO, “YPSA”,¹⁴ reported that close to 60,000 protected mangroves had been destroyed to make way for ships to be able to access the shipbreaking yards located along the coast. The removal of the protection from coastal erosion that had been afforded by the mangroves led to a drastic shift in the coastline of the country, as it exposed much larger swaths of the coastline (measured in terms of width as well as landward-extent) to extreme-weather events such as cyclones, storms and storm-surges.

In a disconcertingly large number of cases, countries and the shipping companies registered in them are either simply ignorant of the consequences of selling their ships to yards or are greedy enough to continue to do simply because it generates high profits and releases them from several responsibilities. By selling off their ship to such a yard, there are distancing themselves from the ship and any obligations that come with its disposal. They sell it to cash buyers (mostly dealers or middlemen who deliver the ship to its destination for dismantling) who are linked directly with the yard. There are companies that specialise in the trade of end-of-life vessels and they even help shipowners avoid the legal, financial or other risks that might arise if they were to deal with ship yards directly. At the level of companies themselves, as a 2019 report, titled “The Toxic Tide”, by the Belgium-based NGO “Shipbreaking Platform” states, *“No shipping company can claim to be unaware of the dire conditions at the beaching yards, still they massively continue to sell their vessels to the worst yards in the world to get the highest price for their ships.”*¹⁵ According to the report, the “top dumpers” in 2019 were: Evergreen Marine Corp (Taiwan), Waruna Nusa Sentana (Indonesia), and Zamil Group (Saudi Arabia), Tidewater (USA), Maersk (Denmark), SINOKOR (South Korea), Berge Bulk (Bermuda), Costamare (Greece), Angelicoussis Group (Greece), Continental Investment Holdings [CIH] (Singapore), and Mitsui OSK Lines [MOL].¹⁶

The Legal Challenges

On 28 November 2019, India ratified the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships. Although the Convention has been praised by the government and the shipping community, it has been criticised by NGOs, environmentalists and human rights workers. Some of the reasons for this criticism are (1) it does not ban the beaching of ships; (2) it does not set stringent standards for the handling of hazardous materials; (3) it has no specific provisions for the protection of the workers; and (4) it does not place any embargo on transporting hazardous wastes to other countries. The fear is that an already dismal situation will be legitimized by this Convention .

India passed the “Recycling of Ships Act” in 2019, ratifying the Hong Kong Convention and laying down statutory regulations for all matters related to ship-recycling within the territory

¹⁴ Dr Md. M. Maruf Hossain, Mohammad Mahmudul Islam, “Ship Breaking Activities and its Impact on the Coastal Zone of Chittagong, Bangladesh: Towards Sustainable Management”, Institute of Marine Sciences, University of Chittagong, 2019.

¹⁵ “The Toxic Tide: 2019 Shipbreaking Records”, NGO Shipbreaking Platform website,

<https://www.offthebeach.org/2019/>

¹⁶ *Ibid*

of India. This reflects an attempt to double the size of the ship-recycling industry by 2024 and to provide 1.5 lakh jobs. It is a significant flaw that this Act lacks any details regarding the handling of materials, the safety measures that are to be adopted for the workers, or any sustainability-requirements in the manner in which the dismantling is to occur.

Section 6¹⁷ of the Act does specify that no ships shall have materials that are listed as hazardous, by the Central Government, but also states that ships may be allowed to contain such materials if the Central Government so allows. Thus, there is no strict application of any limitation; there is ample scope for interpretation as per convenience, and enough ‘wiggle room’ for offenders to get away with non-compliance. For instance, Section 11 of the Act states that no ship recycler may recycle a ship unless there is strict adherence to Section 12 of the Act. However, the following section lays out a long procedure that is far from the reality that is evident in the filth-ridden, toxic coastal regions in the vicinity of the shipbreaking yards. Likewise, Chapter V deals elaborately with the process of recycling ships but the expression “*environmentally safe*” is not mentioned even once. It just talks about “guidelines” without elaborating what these guidelines actually are. There are no strategies pertaining to the current shipbreaking yards and how this Act aims to include them within its ambit or convert them into registered facilities.

This astonishingly lackadaisical attitude, which effectively allows the government to duck its responsibility to coherently list out the obligations, processes and procedures in expression — or, if one was to be harsher — the disregard for environmentally safe practices — is the reason why there are tonnes and tonnes of waste, hazardous substances and toxic chemicals that are being pushed out into the oceans, degrading and destroying the lives of not just the workers at the shipbreaking yards, but the fishing community and the general coastal community, as well. There seems to be a major disconnect between the ground reality and the policy, and a wide chasm between policy makers and industry experts (the latter including environmentalists, marine engineers, marine biologists, maritime lawyers and thinkers).

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)— and especially the Ban Amendment (Decision III/1), adopted at the third meeting of the Conference of Parties (COP) — specifically prohibits OECD countries, the EU and Liechtenstein¹⁸, from exporting hazardous waste to developing countries and specified that end-of-life vessels would also come under the category of hazardous waste. There are absolutely no exceptions and no reservations under this amendment. However, by the simple expedient of not ratifying the Amendment, nation-states are able to retain the right to decide whether or not they would import/export these waste materials, even if the Convention explicitly prohibits such trade.

¹⁷ Section 6-(1) No ship shall install or use such prohibited hazardous materials as may be notified by the Central Government: Provided that the Central Government may, by notification and for the reasons specified therein, exempt certain class or category of ships from the provisions of sub-section (1). (2) Every ship shall comply with such restrictions and conditions, as may be prescribed.

¹⁸ Annex VII, Basel Convention

This brings one to another major problem of the industry — Flags of Convenience. Typically, a ship is registered under the flag of a particular State (called the Flag State), which then has the primary obligation to ensure the safe and sustainable disposal of the ship. However, more often than not, there is a major discrepancy between the actual owner of the ship and the flag flown by the ship. There are some States that have lower taxes and regulations and poorer standards of adherence to safety protocols. The flags of such States are known as ‘Flags of Convenience’ (FOC). FOC compete for ship registrations and the profits are split between the original beneficiary and the State. In any case, shipowners can quickly and very easily change their flags so to evade all responsibility by a move that is popularly called ‘flag hopping’. The United Nations Conference on Trade and Development (UNCTAD) has reported that nearly 73% of the world’s fleet was sailing with the flag of a country other than that of the original country.¹⁹

Panama, Marshall Islands and Liberia are the top three FOC countries. They are often amongst ‘black’/‘grey’ flagged countries, which colours denote the lowest adherence to international regulations and laws. This poses a much bigger problem than just the sustainable disposal of ships. The IMO functions in such a way that any Convention comes into force when countries that represent a certain degree of the world’s shipping fleet have ratified it. Because of this, the head of the delegation of Panama is nicknamed ‘Mr IMO’. These small countries, with no shipping corporations of their own, call the shots simply because other countries switch to their flags at the end of the ship’s life. This indirectly gives massive power to the shipping corporations to tip the balance in their favour as and when required. FOC are hardly used during the operational life of the ship but they are very popular during the last voyage of the ship, as this stratagem allows the shipping companies to bypass all the regulations placed by the original country vis-à-vis ship-recycling and to transport the vessel with impunity to shipbreaking yards in India or other South Asian countries.

Recommendations

The overarching recommendation is, of course, to tighten India’s “Recycling of Ships Act, 2019”. However, since this would be a convoluted process, an easier and quicker solution would be to issue stringent regulations under the existing Act.

The relocation of shipbreaking yards is a major recommendation that has been made by numerous industry experts, so that ships cannot simply be beached. However, this would immediately remove the geographical advantages that countries such as India, Bangladesh and Pakistan enjoy. Perhaps the more viable approach would once again be to formulate and implement much stricter regulations under the existing “Recycling of Ships Act, 2019” that would minimise or eliminate pollution, while simultaneously bring the entire shipbreaking industry under the purview of other extant pieces of Indian legislation that govern the

¹⁹ Flags of Convenience, NGO Shipbreaking Platform, <https://shipbreakingplatform.org/issues-of-interest/focs/>

prevention of pollution, such as “The National Green Tribunal Act, 2010”, “The Air (Prevention and Control of Pollution) Act, 1981”, “The Water (Prevention and Control of Pollution) Act, 1974”, “The Environment Protection Act, 1986”, and, most important of all, “The Hazardous Waste Management Rules, 2016”.

There is an urgent need for public-private partnership to ensure a better standard of care and safety. Extensive training, the advancement of connectivity, the insistence upon standardised protective gear, clean technologies, and, a strict adherence to approved channels of waste-management can best be ensured by robust public-private partnerships. Implementation needs to be ensured by interdisciplinary committees made with different ministries working in tandem with each other. (Ministry of Labour, Shipping, Environment, Energy, Commerce, etc.).

The overall statutory framework urgently requires to be made more comprehensive and must include internationally established, standard operating processes and procedures, inspection regimes, the establishment of laboratories and waste-management plants, etc.

The Government must proactively create conditions that incentivise Indian shipowners to register their vessels in India, while disincentivising them from registering ships under foreign flags, especially Flags of Convenience. Towards this end, the importance of the need to establish a ‘genuine link’ between the Flag of Registry and the owner of the ship cannot be overstated.

The Government needs to take advantage of best practices of other countries, especially those of the EU. In this context, there is much that might be gained from the 2016 EU report²⁰ that introduced a financial incentives to promote safe and sustainable shipbreaking activities. This report, *inter alia*, recommends that a “ship recycling license” be given to all ships visiting EU ports, irrespective of the Flag State. Contributions are to be collected from all ships on every visit and the cumulative amount is to be set aside and utilised during the end-of-life voyage and recycling processes, with the condition being that the amount collected would be disincentivising paid to the owner only if they the is to be recycled at an approved and vetted facility.

Stricter penalties need to be imposed by courts and legal authorities, drawing from the precedent set by the “Seatrade Case”,²¹ where the Rotterdam District Court imposed a heavy fine upon the shipping company for sending four of its vessels for shipbreaking in contravention of the EU Waste Shipment Regulation. The shipping company was held criminally liable and was made to pay for all the evasions they undertook.

²⁰Final Report, “Financial Instrument to Facilitate Safe and Sound Ships”, European Commission, June 2016. https://ec.europa.eu/environment/waste/ships/pdf/financial_instrument_ship_recycling.pdf

²¹ State of Amsterdam v Seatrade, ECLI:NL:RBROT:2018:2108 <https://www.rechtspraak.nl/Organisatie-en-contact/Organisatie/Rechtbanken/Rechtbank-Rotterdam/Nieuws/Documents/English%20translation%20Seatrade.pdf>

Due diligence in respect of human rights, along with a stakeholder-analysis, involving the fisheries sector and other locals affected, along with a strict implementation of guidelines²² released by the IMO, ILO and UNEP, are other crucial measures that are very strongly recommended.

Conclusion

India, being home to the largest shipbreaking yard in the world, should lead the industry by example. As things currently stand, however, it has a long way go before it can establish responsible, environmentally sensitive leadership in terms of shipbreaking. International Conventions will always have shortcomings in terms of implementation and execution as it is difficult to bind sovereign countries by stringent rules which might not be favourable to them in the long run. The Western one-size-fits-all approach is naive if not condescending and generates significant levels of reluctance in countries whose economies are dependent on this industry. The adoption of a laissez faire approach by countries such as India, Bangladesh, and Pakistan, on the other hand, turns out to be exploitative on a number of levels. Environmentally sensitive and sustainable shipbreaking is an important segment of the Blue Economy that India professes and if New Delhi wishes to be taken seriously in executing potentially-visionary initiatives such as the Indo-Pacific Oceans Initiative (IPPOI), legislation — and far more important, the execution of legislation — is critical. Neither policy makers nor policy shapers can evade their responsibilities towards the cessation of rampant and wanton pollution that currently characterise India's shipbreaking industry. There is no alternative to sustainable industrial practices that are structured around the imperatives of safety and welfare of the workers, the safety of the locals, and, the crying need to bring an immediate halt to the ongoing severe degradation of the environment. The shipbreaking industry itself needs to lead the way.

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²² Report of the Conference of the Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Conference of the Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 25-29 October 2004
<http://www.basel.int/Portals/4/Basel%20Convention/docs/meetings/cop/cop7/docs/33eRep.pdf#page=63>