

SHIP RECYCLING INDUSTRIES AND ITS ENVIRONMENTAL IMPACTS: A COMPARITIVE STUDY

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INTRODUCTION

The disposal of low level radioactive wastes, oil pollution from vessels, and the pollution from land based sources are the main threats to maintaining a healthy environment in the world. One of the recent development in the field of industrialization that the commencement of ship recycling industries. These industries are also one of the major causes for the marine pollution because huge amount of wastes are disposed into the sea this may adversely affecting the marine ecosystem. The ship recycling Industries are causing a major threat to the living and non living system existing in the coastal waters.

Due to the massive exposure of shipping industry and it leads to the increase in the number of vessels which is to be engaged in the marine transportation. Though the demand of ships also to be high according to its market value. While non- stoppage of ships its cause harm to the ships and results to the death of a ship. Practically, the death of vessel leaves not much option for the owners to dispose it other than recycling. The pollution caused by the ship recycling industries is another threat to the marine eco system. Due to the ship recycling industries , large amount of non- degradable wastes are disposed into the sea, this may cause harm to the marine environment². A recent conference of the International Metal Worker's Federation, predicted that there should be a remarkable growth in the next twenty five years³. India is a leading nation in ship breaking at the rate of 30.29% gross tonnage⁴. The other countries are china at 31%, Bangladesh at 26.84% and Pakistan at 8.42%. The rest of the world is only at 3.81%⁵. The Alang in the western coast of India is the biggest ship recycling sites in the world offering two million tons of steel per annum for Indian industries and providing job opportunities for over 4000 people⁶. If properly regulated, this industry would be an asset to India's national revenue. So due to this reasons the Union Government gives

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² www.greenpeace.org/Ship_recycling/alang/factsheet.

³ Ship Building Statistics , March 2011, Ship Builders Association of Japan quoted at International Metal Worker's Federation International Ship Breaking Conference , 19-20 April 2011 at Mumbai, available at <http://www.imfmetal.org/files/110421161510005/kan>

⁴ *Ibid.* Also see , Ramapati Kumar, *Ship Dismantling :A Status Report on South Asia*, Mott Macdonald and wwf-India.

⁵ *Ibid.*

⁶ *Report on the High powered committee on Management of Hazardous Waste, Government of India, available at <http://envfor.nic.in/cpcb/hpcreport/chapter-3>*

more emphasis on the development of ship recycling industry in its proposed Maritime Policy⁷. The ship recycling industries are earning high profits and gets benefits from the operation of industrial units.

Thus 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. Ship breaking activity is associated with dirty jobs, numerous deadly accidents, insecure labour, environmental injustice, and violation of human rights.

Historical background

The shipbreaking industry started its operations in the 1960s when a Greek ship 'MD Alpine' was stranded on the shores of Sitakund, Chittagong after a severe cyclone. The ship remained there for a long time before the Chittagong Steel House brought the vessel and scrapped it. During the Liberation War in 1971, a Pakistani ship 'Al Abbas' was damaged by bombing. It was later salvaged and brought to the Fauzdarhat seashore. In 1974, Karnafully Metal Works Ltd bought it as scrap, introducing commercial shipbreaking in Bangladesh. The industry flourished during the 1980s. Today it has become large and profitable industry for the south Asian countries.

An overview on Ship Recycling Industries :

Until the 1960s, ship breaking was considered a highly mechanized operation, concentrated in industrialized countries - mainly in the United States, United Kingdom, Germany and Italy. Early 1980s to maximize profits ship owners sent their vessels to the scrap yards of India, China, Pakistan, Bangladesh, the Philippines and Vietnam where pay, health and safety

standards are minimal and workers are desperate for work. It is estimated that over 100,000 workers are employed at ship breaking yards worldwide. Of the approximate 45,000 oceangoing ships in the world about 700 are taken out of service every year. At the end of their sailing life, ships are sold so that the valuable steel - about 95% of ships mass can be reused. Ship breaking activities present both challenges and opportunities for our coastal zone

⁷ *Draft Maritime Policy of India*, dated February 25,2010, available at www.shipping.nic.in, last visited 24th April 2013.

management. Meeting the increasing demand for raw materials such as steel needs to be balanced with the negative impact this activity is having on our coastal environment and the conditions of the workers. Some of the world's largest decommissioned ships are today scrapped at the shores north of Chittagong, which is the second largest city and major sea port in the country⁸. Bangladesh was the top ship recycling nation from 2004-2009. A total of 150 ships dismantled in 2011. 143 ships have already been broken in the first six months of 2012⁹.

The ship recycling industries are highly criticised for causing environmental devastation and health hazards to the coastal area giving¹⁰. Most of the scrapping yards resemble battlefields with metal pieces, asbestos sheets, thermocol, glass bits, oil and other substances. Due to the disposal of these sought of harmful substance may negatively affecting the existence of living organisms and non- living organisms. Thus, the ship scrapping industry in India raises critical environmental issues. Ship scrapping is always known as “pollution haven industry”. The shifting of ship scrapping industries from India to Bangladesh recently shows that Indian regulatory regime has become more stringent than other countries. So the ship scrapping is highly hazardous, but the recycling is recognized as a principle of sustainable development.

Ship recycling¹¹ means an activity of a complete or partial dismantling of a ship at a ship recycling facility in order to recover components and materials for re-possessing and re-use, while taking of hazardous and other materials and includes other operations such as storage and treatment of components and materials on site, but not their further processing and or disposal in separate facilities. If these industries are regulated properly by imposing stringent rules and regulations, the ship recycling is ‘green industry’. A good regulatory regime should be one that inspires the transformation from ship breaking to recycling. This is a highly complicated issue as it often includes reconciliation of socio-economic and environmental concerns.

Negative effects of Ship Recycling Industries:

Ship breaking is therefore a lucrative business with few risks for the yard owners, investors and money lenders. Ship breaking activities present both challenges and

⁸ <http://www.shipbreakingbd.info/overview.html>.

⁹ *Ibid.*

¹⁰ www.greenpeace.org/shiprecycling/Alangfactsheet

¹¹ Ship Recycling Convention, 2009, Art.2(10)

opportunities for our coastal zone management. Meeting the increasing demand for raw materials such as steel needs to be balanced with the negative impact this activity is having on our coastal environment and the conditions of the workers. The member nations of the European Union, the USA and china have highly sophisticated recycling facilities but they are not in position to compete with cheaper options available in India, Bangladesh and other developing nations. The environmental and health laws are less stringent. The labour is also cheaper as compared with the American and European situation. The people employed in the scrapping industries are very poor and illiterate. The negative impacts of ship recycling industries are not limited to environmental problem and it may extend to human right violation also¹².

Environmental Impacts:

Ship breaking activities is a threat to both the terrestrial and marine environment as well as to public health. It is like a mini version of a city that discharges every kind of pollutants a metropolis can generate like liquid, metal, gaseous and solid pollutants¹³. Though ship breaking has earned a good reputation for being a profitable industry in developing countries there are a number of environmental and human health hazards. Depending on their size and function, Pollution from burning ship scrapped ships have an unladen weight of between 5,000 and 40,000 tons (the average being 13000+), 95% of which is steel, coated with between 10 and 100 tons of paint containing lead, cadmium, organotins, arsenic, zinc and chromium.

Ships also contain a wide range of other hazardous wastes, sealants containing PCBs, up to 7.5 tonnes of various types of asbestos and; several thousand litres of oil (engine oil, bilge oil, hydraulic and lubricants oils and grease). Tankers additionally hold up to 1,000 cubic meters of residual oil. Most of these materials have been defined as hazardous waste under the Basel Convention¹⁴.

¹² Dr. Hossain, Md. M. M. & Islam, M. M., “*Ship Breaking Activities and its Impact on the Coastal Zone of Chittagong, Bangladesh: Towards Sustainable Management*”, Young Power in Social Action . pp 13-17

¹³ David Dodds, “*Breaking Up Is Hard To Do: Environmental Effects of Ship Wrecking and Possible Solutions under India’s Environmental Regime*”, 20 Pac. Mc George Global Bus. & D.L.J.207(2007).

¹⁴ Basel Convention on Transboundary Movement of Hazardous Wastes and their Disposal, 1989.

Pollutants and its effects:

Asbestos

Asbestos powder found near the ship breaking yards. Asbestos was used in old ships as a heat insulator. As there are no asbestos disposal procedures, during scrapping, workers and the surrounding environment are exposed to the asbestos fibers. Exposure to asbestos fibers (even in very low concentrations) especially through inhalation may cause cancer and asbestosis. On the ship breaking beaches, asbestos fibers and flocks fly around in the open air. Workers take out asbestos insulation materials with their bare hands. It has also proven to be one of the most lethal, as inhaling asbestos fibers can lead to a wide range of pulmonary problems such as asthma and asbestosis - and can also be the direct cause of mesothelioma¹⁵.

Heavy metals

Heavy metals are found in many parts of ships such as in paints, coatings, anodes and electrical equipment. These are taken apart with no protective measures in place and reused. Exposure can result in lung cancer, cancer of the skin, intestine, kidney, liver or bladder. It can also cause damage to blood vessel.

Persistent Organic Pollutants (POP's)

The ship breaking activities are the source of Persistent Organic Pollutants. POPs are chemicals that are highly toxic, remain intact in the environment for long periods, become widely distributed geographically, bio accumulate through the food web, accumulate in the fatty tissue of living organisms and pose a risk of causing adverse effects to the human population, wildlife and the environment. There has been a realization that these pollutants, upon exposure of human population, can cause serious health effects ranging from increased incidence of cancers to disruption of hormonal system¹⁶.

Oil Pollution:

Another pollutant discharged during the ship breaking is oil and causes a heavy damage to the marine eco system and leads the way to the environmental problem like reducing the rate of oxygen in the sea water and may adversely the marine living organisms. It also causes damage to the bird population by coating their feathers with oil which causes buoyancy and

¹⁵ <http://www.shipbreakingbd.info/Environment.html>

¹⁶ *Ibid.*

insulation losses¹⁷. Sometimes spilling may cause wide spread mortality amongst the population of fish, mammals, worms, crabs, mollusks and other water organism.

Effect of ship breaking on physiochemical properties of seawater:

Ship scrapping activities pollute the seawater environment in the coastal areas. As a result, toxic concentration of ammonia, marine organisms found in seawater had an increase in PH levels. Extensive human and mechanical activities accelerate the rate and amount of seashore erosion and results in higher turbidity of seawater. Critical concentration of DO and higher BOD were found with an abundance of floatable materials (grease balls and oil films) in the seawater.

Ship breaking on inter-tidal sediments and soils:

In ship breaking areas various refuse and disposable materials are discharged and spilled from scrapped ships and often get mixed with the sand. The scraps from the ships are staked haphazardly on the sea shore, leaving behind the shore may serious damage to the coastal eco system. This result into the sea shore erosion and increase the turbidity of sea water and sediments in the area.

Impact of ship breaking on biodiversity:

As a result of operation of ship breaking industries, the growth and abundance of marine organisms especially plankton and fishes may seriously be affected. Indiscriminate expansion of ship breaking activities poses a real threat to the coastal inter-tidal zone and its habitat. Through the continuous discharge of wastes and other harmful substances into the coastal waters may affecting the coastal ecosystem and its affecting the life span of mangroves and other aquatic organisms. Ship breaking activities contaminate the coastal soil and sea water environment mainly through the discharge of ammonia, burned oil spillage, floatable grease balls, metal rust (iron) and various other disposable refuse materials together with high turbidity of sea water.

Ship Breaking Industries and Human Rights Violation:

The ship breaking workers come from the poverty stricken region where there are limited employment opportunities. An organisation called YSPA¹⁸ makes a study on the impacts of

¹⁷ *Ibid.*

ship breaking industries and conditions of labours who are working in the industries. The workers in ship breaking industries are majority in between age of 18 -25¹⁹. The labours working for an hour basis and their salary are not in compliance with actual wage rates. There are no arrangements for pure drinking water, healthy food, hygienic toilets and living conditions for the workers. It was observed that 86.44% of the labour force stated that they received no medical facilities from the ship yard owners, 5.93% said they received medical facilities, 4.15% said they got medical facilities but in a nominal way or by way of first aid treatment and 1.69% stated sometimes they got medical facilities and sometimes not. As the government has not recognised it as an industry, the industry based labour laws (for example the Factory Act 1965) do not apply. Though the workers have been working in the scrap yards for years they are not allowed to form or join a trade union to bargain and enforce their rights. The workers are deprived of proper compensation due to the lack of a valid contract. Working in the ship breaking yards is a very dangerous job, which involves many human health risks. Sometimes gases explode killing workers. In ship breaking industries the labours are working in pathetic condition and their rights are not protected²⁰. So the government should take adequate measures to protect the rights of workers who are working in the ship recycling industries.

Ship Breaking and International Law:

The ship breaking industries are the recent emergence in the industrial sector. The issue of adopting the safety guidelines in ship scrapping was raised for the first time in the meeting of Marine Environmental Protection Committee²¹ of IMO in its 44th session in March 2000. The assembly has adopted a resolution A.962 (23) on Guidelines on Ship Recycling in November-December 2003. But this was later amended by Resolution A.980 (24). The guidelines are addressing on all stake holders in the industry including the flag, port and recycling states, intergovernmental organizations and commercial bodies such as ship owners, ship repairs, ship builders and ship recycling yards. By developing these guidelines IMO relied on the “Industry Code of Practice on Ship Recycling”²², these guidelines produced by the Basel Convention²³ that focussed on the issue relates to the ship recycling

¹⁸ Referred as Young Power in Social Action,

¹⁹ YPSA, Study report on *impact of ship breaking industries*.

²⁰ *Ibid.*

²¹ Hereinafter referred as MEPC.

²² www.marisec.org/recycling, last visited on 26th April 2013.

²³ <http://www.basel.int/ships/techguid.html>, last visited on 30th April 2013.

facilities, and also the guidelines of the International Labour Organization²⁴ that addressed working conditions at recycling yards. These guidelines are clearly mentioning about the responsibility of maintaining an environmental safety compliance vest with the recycling state. The recycling facilities in consultation with the ship owners are to develop a 'Ship Recycling Plan'²⁵, before when the ship enters into the ship recycling yard. The SRP should clearly mention about the methods and procedures relating to the marking and removal of hazardous substances, worker's safety and health, sound environmental practices and works that may be accomplished prior to and on arrival of the vessel at the recycling facility.

The Assembly adopted a new Guidelines 981 (24)²⁶ also demanded a new legally binding on Ship Recycling, which provided regulations for the design, construction, operation and preparation of vessels for sound recycling; and the establishment of appropriate enforcement machinery to regulate and control ship recycling. The MEPC 55th session had also developed the text of the draft ship recycling regulations for International shipping and recycling activities and also called upon an international conference to discuss the possibilities of adopting the convention on ship recycling. Thus Hong Kong International convention for the Safe and Environmentally Sound Recycling of Ships 2009 comes into existence and plays a dominant role in controlling and regulating the ship scrapping industries.

INTERNATIONAL CONVENTIONS:

The Basel Convention²⁷

It is a very important piece of international law, and its legal position in Europe is effectively enshrined in the European Waste Shipment Regulations (EWSR). Of potentially equal importance is a piece of proposed follow-up legislation called the 'ban amendment'. This states that it is illegal to transport waste from an OECD country to a non-OECD country. While this amendment has not come into force, several countries have ratified it, including the whole of the EU, which means it is law for all EU countries. It is also law for China and Turkey, but not India. Coupled with this amendment is a decision by the Basel Convention that a ship 'may' be defined as waste²⁸ because of the hazardous materials it contains. The Basel Convention is a part of the United Nations System and is administered by the United

²⁴ www.ilo.org/public/english/protection/safework/sector/shipbrk/index.html, last visited on 16th April 2013.

²⁵ Hereinafter referred as SRP.

²⁶ www.imo.org/marineenvironment/shiprecycling, last visited on 25th March 2013.

²⁷ *Supra note ,page*

²⁸ Art 2 of Basel Convention reads: "Wastes are substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law".

Nations Environment Programme. The Basel Convention regulates the Transboundary movement of hazardous and other wastes, as listed in Annexes 1 and 11. The convention covers the environmentally sound management of hazardous and other wastes and their disposal. These principles are augmented to the design and operation of ship recycling facilities.

The relevant bodies of the Basel Convention have developed and approved guidelines that relate not only to ship dismantling, but also to specific waste streams that may be generated during the ship recycling activities.²⁹ However, the Basel Convention can only really be applied after the law has been broken, making it ineffective in a fluid international industry such as shipping, since it is unlikely that an owner would deliberately declare an intent to contravene the legislation. Although, as mentioned before, a sale ‘as is, where is’ for scrap is increasingly likely to be interpreted as a declaration in the future. It is generally acknowledged that the Basel Convention is difficult to put into practice for ships.

The International Labour Organization (ILO)

The International Labour Organization is the oldest organisation of the United Nations, and its Conventions cover a vast field of law from health and safety to workers’ rights and child labour. Some of the major ILO conventions are still not ratified by the principal ship breaking nations. Despite this, the ILO’s expertise in labour matters means it has an important role to play in ship recycling. The ILO introduced Guidelines in matters relating to safety and protects the healthy conditions of workers in the ship recycling industries. It’s named as Safety and health in ship breaking: Guidelines for Asian countries and Turkey in 2003.

The Hong Kong Convention

The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (the Hong Kong Convention), was adopted at a diplomatic conference held in Hong Kong, China, from 11 to 15 May 2009, which was attended by delegates from 63 countries. The Hong Kong Convention intends to address all the issues around ship recycling, including the fact that ships sold for scrapping may contain environmentally hazardous substances such as asbestos, heavy metals, hydrocarbons, ozone-depleting substances and

²⁹ <http://www.basel.int/ships/techguid.html>, last visited on 25th April 2013.

others. It also addresses concerns raised about the working and environmental conditions at many of the world's ship recycling locations. The convention aims at ensuring that ships, when being recycled after reaching the end of their operational lives; do not pose any unnecessary risks to human health, safety and to the environment.

Regulations in the new Convention cover: the design, construction, operation and preparation of ships so as to facilitate safe and environmentally sound recycling without compromising the safety and operational efficiency of ships; the operation of ship recycling facilities in a safe and environmentally sound manner; and the establishment of an appropriate enforcement mechanism for ship recycling, incorporating certification and reporting requirements. The convention ensures that the ship recycling facilitates to establish a ship recycling plan and for the flag states to conduct a final survey in order to issue an international ready for recycling certificate. An important element is the limitation for the use of hazardous materials in ship building.

Ship recycling yards will be required to provide a "Ship Recycling Plan", specifying the manner in which each ship will be recycled, depending on its particulars and its inventory. Parties will be required to take effective measures to ensure that ship recycling facilities under their jurisdiction comply with the Convention. There are certain guidelines have been developed and adopted to assist States in the early implementation of the Convention's technical standards as follows MEPC.197 (62)³⁰, MEPC.196 (62)³¹, and MEPC.210 (63)³².

But this International convention is already under high criticisms; because of many of the provisions in the Hong Kong convention is technical in nature. Also there is ambiguity regarding the implementation of provisions is in conflict with the domestic law that is why we say that this International convention is not reach up to the mark.

MARPOL³³73/78:

The M,ARPOL was adopted on 2nd November 1973 at IMO and covered pollution by ships from oils, chemicals, and harmful substances in packaged form, sewage and garbage. This convention bans oily discharge, and applies to ship breaking yards as they discharge oil and

³⁰ Guidelines for the Development of the Inventory of Hazardous Materials, 2011.

³¹ Guidelines for the Development of the Ship Recycling Plan, 2011.

³² Guidelines for Safe and Environmentally Sound Ship Recycling, 2012.

³³ International Convention for the prevention of pollution from ships, 1973, as modified by the protocol of 1978 hereinafter referred as MARPOL.

other greasy materials. This convention also ensures that the ship owner will be liable to pay compensation for cleaning up the pollution from his ship.

COMPARATIVE ANALYSIS WITH PAKISTHAN, CHINA AND INDIA:

At present, the global centre of the ship breaking and recycling industry is in South Asia, specifically Bangladesh, India, and Pakistan. These three countries account for 70–80 percent of the international recycling market for ocean-going vessels, with China and Turkey covering most of the remaining market. Only about 5 percent of global volume is scrapped outside the South Asian countries.

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. Ship breaking activity is associated with dirty jobs, numerous deadly accidents, insecure labour, environmental injustice, and violation of human rights³⁴.

Position in Pakistan:

The Pakistani ship-breaking industry is for this very reason situated mainly in Gadani, Balochistan, about 50 kilometers away from Karachi. A 10 kilometers long beachfront here plays host to as many old and tired ships as need be, as long as said need is below 125 ships. It produced a million tonnes of scrap metal each year, thus fueling the Pakistani steel industry. The Pakistan government earns heavy revenue from these kinds of industries and they promoting the ship recycling industries by reducing the tax rates etc. The government should impose strict rules and regulations regarding the operation of industries then it will be good success otherwise it causes heavy threat to the existence of whole living and non living things.

Position in China:

When we analysing the statistical survey³⁵ identifies that the situation in china is similar that of other Asian countries. In China ships are broken in docks with cranes and machinery. But

³⁴ *Supra note.*

³⁵ *Supra note YEPSA*

the working conditions are almost the same in ship-breaking yards as all over Asia, such as, insufficient protection.

In 2000, in an inspection of four Chinese ship-breaking yards it was found that workers were insufficiently protected against toxic and hazardous materials. Toxic waste was burnt in open fires. Asbestos was removed without proper protection for workers. The carcinogenic material was sold for reuse to industries producing heating systems. Yards were heavily polluted by oil, heavy metals and other toxic substances. Pollution had spread outside the yards as well.

Indian Scenario:

In India most of the ship recycling industries are located in the coastal areas of Gujarat. 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. The yards in Alang are famous in the ship breaking industry. Located along the bank of the Arabian Ocean and concentrated around a coastal area named Alang of Vabh Nagar, in the state of Gujarat, almost 3000 kilometres from Chittagong, Bangladesh. The Alang ship breaking yards started scrapping ships in 1983. Estimates vary, but it has maybe 160 potential plots for use as ship recycling facilities. According to the Gujarat Maritime Board, a total of 415 ships were dismantled at the Alang facility, averaging 38.6 million tonnes of light ton displacement (LDT) against 28.2 million tonnes LDT in 2010-11³⁶.

We all know what does it means Ship breaking or ship demolition is a type of ship disposal involving the breaking up of ships for scrap recycling. Most ships have a lifespan of a few decades before there is so much wear that refitting and repair become uneconomical. Ship breaking allows materials from the ship, especially steel, to be recycled. Equipment on board the vessel can also be reused.

Law on Ship Recycling in India: Nowadays, the ship recycling industries are one of the major concerns in India, due to the disposal of hazardous waste disposal into the coastal waters. One of the major questions comes before the union government that how can it be

³⁶ <http://www.imo.gmbport>.

restricted and what are steps to be taken by the authority to minimize the pollution caused from the ship recycling industries.

In India at present there is no specific law in relates to the international waste shipment. When it comes to the ship breaking, jurisdiction is conferred on multiple authorities under various laws such as Maritime zones Act 1976, the Coast Guard Act 1978, Environmental Protection Act 1986, the Gujarat Maritime Board Act1981, and Ship Recycling Regulations 2006. These legislations are specifically covered the control environmental pollution during the ship breaking. The ship breaking in India is strictly done in compliance with the Honourable Supreme court decision in *Clemenceau case*³⁷. The recommendations made Supreme Court as follows: The proposed Ship Recycling Code is aimed at ensuring that ships, when being recycled after reaching the end of their operational lives do not pose any unnecessary risk to human health and safety or to the environment. the said order, the officials of Gujarat Maritime Board along with officials of the Gujarat Pollution Control Board, the Customs Department, National Institute of Occupational Health and Atomic Energy Regulatory Board shall oversee the ship breaking arrangements and implementation of the recommendations of CTE until further orders. The Collector of the concerned District shall be associated when the actual dismantling takes place. These authorities shall also vet the documents mentioned in various chapters of the report to be submitted by the ship owner for the purpose of grant of permission for ship breaking.

The Supreme Court also laid down certain guidelines with regard to the anchorage and beaching of ships. All maritime port authorities and ship owners should comply with these guidelines; the ship owner / recycler / importer should submit the following documents well on advance of the arrival of the ship for recycling for desk review by the Gujarat Maritime Board (GMB) in consultation with Gujarat Pollution Control Board (GPCB) and Customs Department regarding the name of ships, registration and other matters. And another step is assessment of hazardous substances. The ship is permitted for anchoring; the proper authorised officer of Customs shall forward the Desk Review report/opinion to the Port Officer, GMB, along with a copy of thereof to the ship owner / recycler /importer.

³⁷ *Research Foundation for Science and Technology and Natural Resources Policy v. Union of India & Others.. (2007) 8 S.C.C 853.*

The procedure is same as in the case of beaching of ships whereas, the ship is permitted for beaching, the proper authorised officer of Customs in charge shall forward his report / opinion to the port Officer, GMB, along with a copy thereof to the ship owner / recycler / importer. All concerned authorities shall ensure strict compliance of the Honourable Supreme Court Orders and the procedure lay down, before permitting entry of any vessel into Indian Territorial Waters for breaking purposes.

In India not many states have constituted maritime boards or enacted legislation for controlling pollution in Internal waters from ship dismantling. The Gujarat Maritime Board's Ship Recycling Regulations, 2006³⁸ is the only legislative effort in this regard. The Maritime Board as the apex institution to conduct inspections and coordinating different departments under various ministries. Due to the lack of Indian law on to make regulations on shipment waste, the judiciary has the role to play to tackle the situation. The court laid down principles on different decisions, the principle of sustainable development as envisaged under the constitution of India.³⁹

In *Clemenceau*⁴⁰ case, the *Clemenceau* was the French warship at the time of phase out it contains 130 tonnes of asbestos and other toxic waste. The vessel not in complies with the provisions of Basel convention and denied the entry to many ports. The vessel left it for Alang for breaking in December 2005, but the Supreme Court ordered not to enter into the port. And in this case the Supreme Court held that there should be striking balance between the sustainable development and environmental protection⁴¹. The court also reiterated the 'precautionary principle'⁴² by stating that, the ship breaking operation cannot be commenced without adhering to all precautionary principles.

In another case called as *Blue Lady* case⁴³ the issue comes before the Supreme Court that whether the Alang had technological sophistication for safe ship dismantling. The High level Expert committee, appointed by the Apex court had detailed in its report the catastrophic

³⁸ The Maritime Board was created under the Gujarat Maritime Board Act 1981. The Board has enacted Ship Recycling Regulations, 2006.

³⁹ *Vellore citizens' welfare forum v. Union of India*, (2004) 12 S.C.C 118.

⁴⁰ *Supra note*.

⁴¹ *T.N Godharvarman Thirumulpad v. Union of India*, (2002) 10 S.C.C 606.

⁴² *Vellore Citizens Welfare Forum v. Union of India*, (1996) 5 S.C.C 647.

⁴³ *Research Foundation for Science and Technology and Natural Resources Policy v. Union of India & others*, 2007(9) S.C.R.906

environmental impacts of the ship recycling industry on the coastal environment and health hazards it might cause to the local population. The committee opined that the Alang never had the sophisticated technology to dismantle the vessels and it had no eco- friendly manner. The waste disposal from the Alang may cause heavy damage to the marine environment.

How to regulate the pollution generated from the ship recycling industries:

The pollution generated from the ship recycling industries is regulated only by imposing strict rules and regulations regarding the disposal of wastes from the industries into the coastal waters. To regulate the yards by appointing inspectors, surveyors and other personnel to inspect the yards and submit their reports to the concerned authorities. One of my suggestion that Constitution of an Independent Body for Verification of Shipyards, an independent body which shall verify all the ship breaking yards in the world from time to time should be constituted. The independent body should consist of internationally known experts as well as representatives of NGOs like Greenpeace and International Federation of Human Rights, who have been actively working in the field of ship breaking. This body shall submit its verification report to the international bodies like the Basel Compliance Committee or other appropriate international bodies. Functioning of such an independent reporting body shall minimise the scope for false representations by states or corporations.

Another way is to regulate the pollution from the ship recycling Industries that the Formulation of a Comprehensive Code and Constitution of a Body for Verification and Reporting and also providing training facilities for the workers and awareness about the risks involved. And the recycling industries are regulated through quality monitoring, inspection, reporting and prosecution at national level. Trade and environment should not be in conflicting but they should actually competent each other. The regulatory regime should try to bring in harmony between these two paramount concepts.

In order to tackle the present crisis, there should be co ordination and co operation at national and international levels. And to implement strict laws in relates to the construction, manning and usage of non- hazardous materials in the construction of ships.

Conclusion:

We are trying to demonstrate these serious issues and overcome these problems. Increasing demand of raw materials for re-rolling mills and other purposes and negative impacts on

coastal environments, ship breaking activities present both challenges and opportunities for coastal zone management in a holistic manner. These activities are example of both the potentialities and the dangers of an increasingly globalised economy. It has achieved a good fame for being profitable but it cost huge environmental damage.

A variety of disposable materials and refuse are being discharged from scrapped ships are often mixed with the beach soil and sea water which in turn has a negative impact on our coastal environment and biodiversity. However, accidents are normal phenomena in the ship breaking yards. Over the years more than 1000 workers have lost their lives and were seriously injured⁴⁴. Due to unconsciousness and lack of government patronization, the activities are facing several internal and external problems. Considering all these facts, a distinct and well-balanced policy is necessary for sustainable ship breaking activities.

No one can bother about the crisis faced by the ordinary people due to these industries. The ship owners, contractors and government shouldn't take any precautionary measures to regulate pollution caused from the industries its time to take quick action to regulate the pollution and also keep in balance between the economic development and environmental protection.

There is an urgent need to interconnect the reality on the ground, the dominating economic interests of the shipping industry and the discussions taking place at the international level, in order to change the working and environmental conditions on the yards. So to conclude by saying the government should take proper measures to regulate the pollution from these industries and to keep in balance between the economic development and environmental protection.

⁴⁴ Langewiesche, William. *"The Shipbreakers"*. August 2000;; Volume 286, No. 2; page 31-49. The Atlantic Monthly. Retrieved 22 September 2012.