

Ships recycling, a booster to toddling economy

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Abstract

Ships recycling is a profitable but a hazardous business, requires a great degree of safety, environmental awareness, and a high managerial skills, topped up with a high marketing ability. The question is, can recycling be established in none shipping country and be as successful as being established in a shipping country?

Taking Egypt as example, the eastern borders comprised a long shore-line, with almost no population except few stops counted in one hand, to build up a recycling yard, first this yard would need infra structure, power, water, facilities to accommodate workers, a new community will form. Thence why not, a repair yard can be established since infra structure is there already. Why not establishing a yard for new-buildings, finally the recycled items can be used in the new building, cutting the cost of building itself, and keeping more eyes in the development of the material used during new-building stage. The project from the authors' point of view will act as a magnet to investors, especially with the rise of a new era in Egypt

The idea of ship recycle does not centralize in a mere yard to cut ships in an environmental friendly way, but it is a core for various industries, which can attract another industrial, and commercial communities, if well planned and managed can be a core for mega cities.

Key Words

Ship Recycle - Environmental awareness - Safety - Economy - community

1- Introduction:

It is known now a day that a short cut to a rapid economic growth demands a good understanding and implementation of recycling of material and specifically steel; recycling covers a vast range of material and industries. Developed countries like United States of America considered being the largest recycler by default. At first glance the public thinks of recycling, as communities of groups who are collecting bottles, cans, but in fact its far more than that, it is an industry profited with multi billion Dollars. The composition of the recycling industry comprises three main sectors, collectors, manufacturers and purchasers, taking California as example, according to the records of the Department of Conservation (DOC) and the California Integrated Waste Management (DOC), there are over 16 million Californians served by local curbside recycling programs. The result of this was an added value to the economy of Los Angeles equal to 1.2 billion US Dollars. According to DOC the recycling and remanufacturing of waste material produce substantially more jobs. Here we are more concerned about recycling of ships, where the profit even higher, not is not only calculate as a pure economic effect but also developing effect on the society and population. Iron and steel products are the backbone of any growing economy; it is used in public infrastructure and construction aside from shipbuilding. The need for steel either as ore or as scrape requires a continuous flow of foreign currency which is always not easy to achieve in developing countries. Taking an economy like Taiwan, the economic growth exceeded 10 percent per year in the late 1960, when it became the world's leading ship-breaking country. The ship breaking can produce a considerable amount of steel to cover up the needs of the still mills, but with a bonus the

steel resulting from the ship cutting can be used directly in another or same industry, with minimum treatment. Taking for example Bangladesh, as of 2009, the country had scrapped 200 to 300 ships annually, accounting for 30 percent of the total market share in the global ship dismantling industry, according to the World Bank. More recently, the number has spiked to 400 ships, or eight million gross tons of salvage. The industry provides more than 20,000 direct jobs in Bangladesh, reports the bank and an additional 200,000 jobs for workers in related industries.

In a country devoid of the natural resources to make steel, the ship dismantling industry contributes over 1.5 million tons each year to the Bangladesh steel industry; the steel is broken down in one of the country's more than 350 re-rolling mills. Bars and rods that are often used in construction, also known as rebar, are the most common product.

For this reason, the dismantling industry is often referred to as “the steel mines of Bangladesh.” And the steel mines are big business: each ship equates to just under \$1 million in profit. Revenues come from the sale of salvaged steel and other materials like electrical wires, toilets, sinks, and canned food.

The ships' owners aren't complaining. Disposing of old ships overseas is a benefit to ship companies as it often results in a net gain on a major balance sheet item with little to no value. (Anna Miars, 2012).

The was developing economy such as Japan, Taiwan and South Korea no longer using ship-breaking business, the business shifted to another still developing economies, like India, Bangladesh and Pakistan. The ship-break

does not only have a bright side but it has its own flaws, industrial accidents, environmental pollution, and erosion of marine environment. It does not only affect the breaking area but it travel to affect the trans-boundary sector. The world was much concerned about the effects, the international bodies started to regulate the industry, by establishing the Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, known as the Basel convention. Also the International Labor Organization had her saying in the issue, relaying its concern on the labor safety. The base line here, can the developing economy get the benefit of ship recycling to its best advantage with existing constrains, like industrial accidents, environment pollution, restriction of rules, safety controls?

2- Ship recycling in developing countries:

Ships recycling have a disastrous effect on environment, to restore the damage resulting from pollution caused by recycling it takes decades, to clarify the point, two examples were taken. First, Bangladesh, a developing country, where beaching and cutting of ships at it simplest forms,

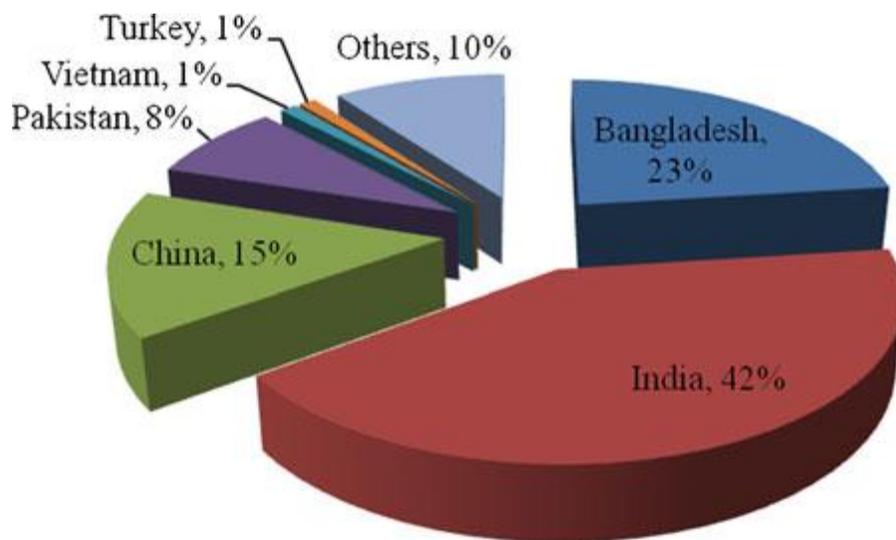


Fig (1) Ship recycling volume 1994-2009, (H. Abdullah et al, 2009)

Despite the primitive way used in cutting ships, Bangladesh has the second biggest portion of the scrape tonnage pie. As shown in fig. (1), it is unethical, risky, and very hostile business to the environment. Fig (2), shows the Long Deadweight Ton (LDT) tonnage which was cut by various countries in the last decade.

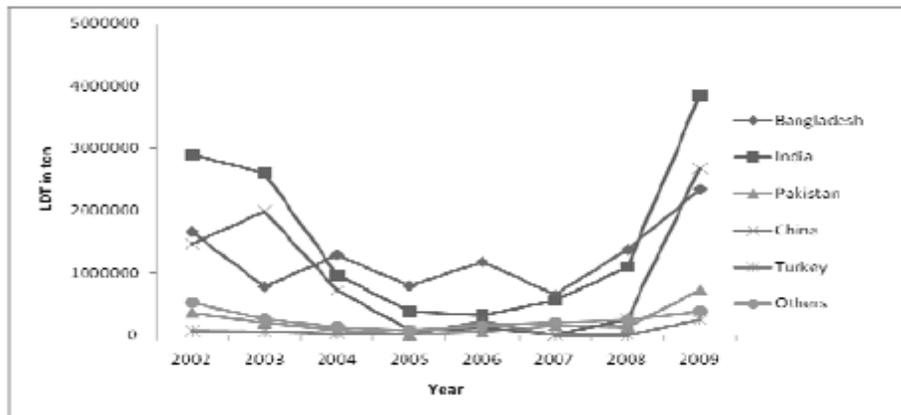


Fig (2) amount of LDT recycled by major recycling country (H. Abdullah et al, 2009)

Because of the large size of LDT, the need to expand along the coast to harbor more ships to beach helping the degradation of the environment, what was known to be forests becomes a vast stretch of sandy beach to accommodate more ships. Till recently the Bangladesh authorities refused to recognize ship breaking industry otherwise a pack of law and regulations has to be implemented, cutting down the profit and the volume of steel resulting from breaking, which is much needed for the still mills.

At Sitakunda the ships are broken up on shore, in tidal water, the results of the cutting is disastrous (E Varder, 2002), the sediments and soil are highly contaminated with oil residues, and other pollutants. In 1995 study, shows that the existence of butyl- tins is extensive in fishes fished from the sites in the region surrounding the cutting sites (K Kanan, 1995). There is no

environmental certification requirement for ships to enter Bangladesh territory. The number of companies involved in ship breaking is on the rise, though there is no clear record for the exact number, since it is not recognized as an industry, but it close to the figure of one hundred companies (G Fringa, 2005).

Bangladesh has to decide whether it would allow continuing its coast to be used as a dustbin of developed world or not. It is an urgent need for sustainable development of the coastal resources. Monitoring of the coastal activity is important in order to save the coastal ecosystems. This monitoring system can give valuable information to the environmentalist, policy maker and different stakeholder interested in coastal environment and resources.

The second example took a different implementation, with more futuristic and modern view, aiming for green ship recycling. The striving China for steel to support the economic booming seeks steel of all sources, from its natural resources, import of raw iron ore, and also from scrape, the idea of using scrape become more in focus after the Oil Pollution Act 1990 implemented, putting thousands of tankers single hulled off the market, Off course China with its mighty power has numerous scrapping sites; one only is taken as example here for its unprecedented achievement, being the only yard to go green. The ship breaking facilities was built recently in 1984; by end of 2010 they have scrapped almost 500 ships (waste management world, 2010). With a proper management system and a well structured organization chart, and professional technicians which provides a full strength, with a group of safety, environmental protection management team which is responsible for the safety and environmental protection during ship-breaking activities, combined with experienced personnel who join in

the site management to strictly control the site for safety and young graduate university students

Seeking to combined theories with practice, with relatively good equipments: 12 sets of floating cranes, 23 sets of deck cranes, 15 sets of auto cranes (12T – 60T), floating dock with lifting capacity of 2200 T which is mainly used to dismantling the bottom part of the ship to prevent contamination of oil with water.

The yard comprises 6 piers each capable of harboring 6 ships at a time, the aim was not only to break ships but developing the process of ship breaking. The result was that, the Tokyo Based class NK issued World's first Statement of Compliance for Ship Recycling Facilities to Zhongxin ship-breaking yard. (Class NK, 2012)

3- Ship recycling in Developed countries:

The best example is The Netherlands, where ship-breaking is done in a very environmental sound, safe, and friendly condition. The ship to be scrapped only after being gas and asbestos-freed, an inventory by a specialized company for environment harmful material to be issued before scrapping also certificate should be issued. The asbestos waste is checked and disposed of in a controlled facility. There are also strict regulations governing the removal of asbestos, all related to the health of personnel performing the removal process, such as the use of specific breathing equipment, and the containment process. Finally, a duly accredited laboratory must issue an Asbestos free certificate. Before the asbestos free certificate is issued, the asbestos areas are inspected visually and the air is sampled for asbestos fiber. The ship is only considered to be safe for scrapping after the asbestos-free certificate has been issued.



Fig (3) oil drain below scrap slope prevents oil pollution (Greenpeace, 2001)

The ship braking in Netherland is an ideal case for a profitable, environmentally sound proof process, starting by using impermeable slopes, the installation of oil drains as well as water-oil separators and provisions for the controlled disposal of oil (Fig. 3). Fires and explosions are minimized because ships are decontaminated of all fuel and residues prior to scrapping. Copper is recovered from insulated cables by a mechanical process and not by burning them. The waste products are subsequently disposed of or further processed by licensed processing companies. Fig. 3 In Netherlands: oil drain below scrap slope prevents oil pollution (Greenpeace, 2001).

The paper-insulated ground cables are processed by the processing companies through four fractions after which possible PCB-containing fractions, such as paper; jute and bitumen are transported to controlled disposal sites. If ships are scrapped, as is often the case in the Netherlands, using other methods (with hydraulic cutters) rather than torch cutting, the problem of generating smoke, fumes and particulates that may have toxic

effects does not occur. In addition, workers are protected because they are relatively far away from the surface being cut.

The Dutch breaking yards must have water-proof floors to prevent contamination of ground water. Important categories of hazardous wastes including waste containing oil and ordinary waste are sorted. This waste must be delivered to appropriate processing companies (Greenpeace, 2001).

4- Egypt A possible target for green ship recycling:

The location of Egypt in the path of the commercial traffic of the world, makes it a potential good ground for green ship recycling, the recycling proven to be a good support to economy in developing countries, as was given in previous examples, it can continue with the economy even after the developed stage. Building up a professional ship recycling hub in Egypt requires, a module based on a collection of modules, with the main concern phased on three points.

The first point is location; the most suitable location for such a hub must be as close as possible to a traffic lane, with suitable inland transportation, a vast shores line. The ideal location can be found in the eastern part of Egypt, the Red Sea west coast.

The second point, environment; despite point number one above, the Red Sea coast is very rich of its underwater structures and creatures which is preserved and called for protection. But if the modern ships recycling patterns are used, as in the Chinese and Dutch ship recycling used, backed up with a strong hold of environmental protection rules and laws, with a vigilant implementation by the existing local authorities; then recycling in this area may not cause a threat to the environment.

The third point investors; investors alone may not be the ideal for ship breaking activity if green recycling is the aim, investors are seeking max profit, albeit green recycling still profitable but non-green recycling sure will be more profitable, to clarify the point Fig (4) shows the total cost and profit in US Dollars for cutting a single tanker in three countries where the safety and environment concern are variable, albeit still not fulfilling the requirement of the international conventions.

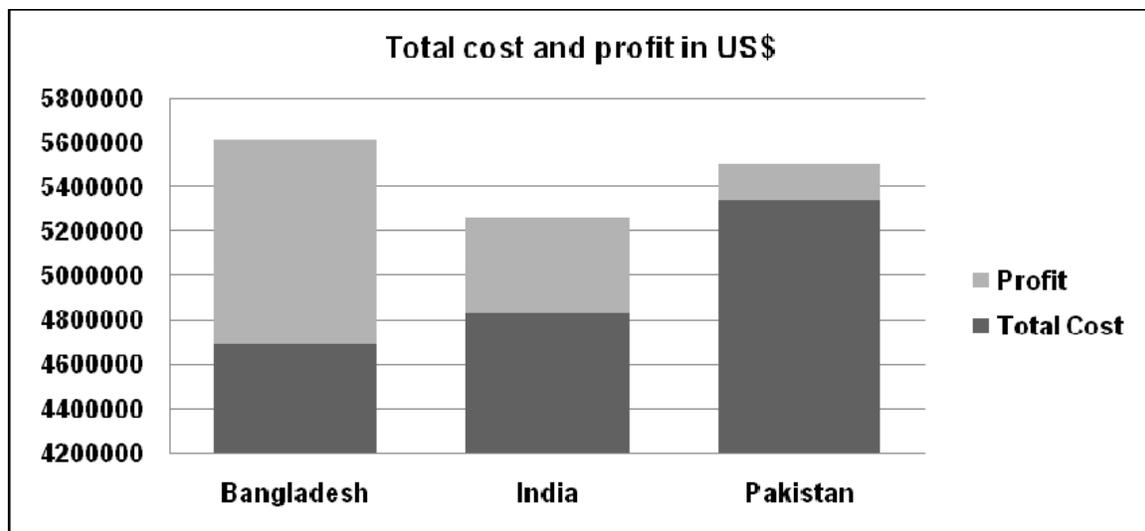


Fig (4) Cost and profit related to recycling the sample tanker (Kh. Akhter Hussain et al, 2010)

To attract investors in Egypt to invest in green ship recycling a package of profits has to be presented on negotiation table, the profit per LTD will not be very attractive since other business in Egypt can fruit more profit. The solution lies in the government hands, the government should take a different approach than what was taken by the Bangladesh government. The Bangladesh government refused to recognize the ship breaking industry since it was born without planning, out of a severe cyclone in 1960, which killed thousands of people and a Greek ship “M D Alpine” was driven ashore by the devastating tidal storm and could not be refloated and was

confined to Fauzdarhat sea shore of Sitakunda Upazilla, The ship remained there for a long time. In 1964 Chittagong Steel House bought the vessel and scrapped it. It took years to scrap the vessel, but the work gave birth to the industry in Bangladesh (Maruf Hussain, 2006). The international rules were not followed and sites owners considered themselves above the law. (Maruf Hussain, 2006).

For establishing a green ship recycling, the government should extend hand with investors to get a proper and sustainable industry. Government should participate in the business by supply land for the site in reduced prices, even on BOT base, to compensate the investors on their loss of profit when implementing the international rules of green recycling, like the Hong Kong Convention 2009. But the question **is**, is it profitable and attractive to investors! The answer lies within the developed countries, taking example of the Dutch government whom agreed to pay out EUR 2m (\$2.54m) to rid itself of the nuisance chemical tanker Sandrien. Work started November, 2004, cleaning the 33,900-dwt ship of asbestos and approximately 9,000 tonnes of cargo. The project is expected to take around seven months. None of the cost to the Dutch taxpayer is expected to be recovered from the vessel's owner, says one of the company's awarded the dismantling contract. The Sandrien (ex- Maria S) is a near-sister of the Erika, which sank off the Breton coast in December 1999. Ecodock, which is using the Sandrien as a springboard to winning other scrapping deals for a proposed EUR 50m environmentally-friendly demolition yard in the northern part of the Netherlands, claims nothing has been heard from the owner, Upperton, for at least a couple of years. The government is said to have only a post-office-box number in Mauritius. "It is going to be very difficult to get the money back," said Monique Arends, communications manager for Ecodock,

whose backers include shipyard group Royal Niestern Sander and P&O Nedlloyd. "With the dismantling of the Sandrien , Amsterdam Ship Repair and Ecodock are taking the first steps towards the standardization of an ecologically sound way of dismantling and recycling ships and platforms, by which a 'zero pollution' process can be guaranteed, "said the project partners. (Daily shipping newsletter, 2004)

The Plans to build a ship recycling yard on the Tyne are back on track after the Dutch company behind the scheme agreed to meet in Newcastle. Representatives from NV Ecodock arrived on Tyne side next week to thrash out a business plan with Wallsend yard Swan Hunter's owner Jaap Kroese. They hope to draw up an agreement for a partnership to bring more than 1,000 ship breaking jobs to the river. The meeting will reaffirm Ecodock's interest in setting up on Tyneside. In May, the company said it wanted to open one of 40 ship recycling yards in Newcastle. It planned to invest £40m to turn the defunct A&P Tyne yard in Wallsend into a shipbreaking centre. It had hoped the first stage of the scheme could be running by now. (Gayle Tomlinson, 2005).

The profitability for investors is not from the cutting and selling cost, but in the sub industry which arise from the ship recycling.

The second question is how to attract labor, keeping in mind that these labor unlike in Bangladesh and India are not cheap labors; they have to be trained to use modern technology in dismantling the ship. Between October 16th and December 31st 2010, 202 vessels have left to be demolished, at a rhythm of 18 vessels a week. India with 78 vessels (39%) achieved the Grand Slam this year with their 4th appearance as the number one spot of demolition in the tonnage category as well as total number of units to be

recycled. With 38 vessels (19%) Turkey stays in second place and reasserts its ambitions with the purchase of three big Canadian bulk carriers. (robin des bois, 2010).

In Turkey and Holland the ship breaking yards obtaining their labor from the local labor market with reasonable payment to attract new workers either blue collars or white collars.

The third question what is for the Government; the full benefit of the ship recycling is in the public benefit, actually it is considered a national project, the benefits is but not limited to the following:

- . Saving lots of foreign currency, Ship breaking activities is of great importance in national economy as it saves a lot of foreign exchange by reducing the import of steel materials.

- . Raw materials for industry: a country like Egypt with no iron ore natural resources has to depend on the scrapped iron to feed the re-rolling mills and steel factories. Ship scrapping is an important source of raw materials as it feeds the steel mills, steel plate re-manufacturing, asbestos remanufacturing,

- . Source of Government revenue: the government annual gain from ship breaking through import tax, yards tax, tax imposed on supplementary industries.

- . Employment opportunities: Ship breaking activities offer direct employment opportunities and different supplementary business related to ship breaking activities (YPSA, 2005). The direct employment can reach up to 600 persons per yard, that is almost 3000 persons including their families, the need to build housing for this number demand other investors and giant construction companies to build houses and facilities, shops, hospitals, government offices, fire brigades, police station, roads, market places, market places for the output of the dismantling equipments such as: Small

motors, pumps and machines (e.g. lathe); Navigational equipments such as, RADARs, GPS, Radio Stations, GMDSS equipments, Gyro Compasses, Magnetic Compasses. Life saving equipment (life buoys, lifeboats, life-vests); flags and navigational manual, Personal protective equipment (e.g. helmet, boots, gloves, overalls), Chemicals and paint, Different steel parts (e.g. anchor, chains, ventilation parts, pipes), Toilet and sanitary equipment (e.g. toilets, sink, and bathtubs), Furniture (e.g. sofa, chairs, tables, beds), Cables and electrical wiring (workshops for removing copper wiring from insulation, without using burning process), Batteries - Insulation material (e.g. asbestos and mineral wool), Kitchen equipments, dishes, Boilers, There is great demand for the wooden planks and furniture, which are sold on the markets.

Sources of building materials: steel rods used for building by re-fabricating steel plate resulting from ships dismantling.

The green ship recycling can be profitable to all parties involved in the business in a developing country like Egypt.

5- Conclusion:

Ship recycling in Egypt will need to have a strong intervention from the government, because if such a business backed up by the government, it gives an assurance for investors, to proceed within a planned scope for long term sustainability, the sharing of responsibilities, and benefits can overcome the setback foreseen or overlooked alike. The government represented by local authority or committee must have a plan for the best intended location, this location should be close to traffic lane, surrounded by a vast area, for future expansion allowing for various recycling sites. The authorities offers the land to investors to use for a long period of time under

BOT system, in return the investors will follow the plan of the authority in building the yard, comprises piers to harbor ships intended for demolition, gantry cranes, portable cranes, handling gears, ware houses, and storage facilities. Authorities should support the investors by introducing the rules and international regulations to be followed to insure safer and healthy working environment for workers as per ILO requirement, and protect environment as per Hong Kong convention 2006, by coaching the investors on the requirement of the conventions and how to work within the scope, the authorities to invite education institutes to take parts in training labors, both for technical training for example jet water cutting instead of torching, to prevent air pollution, training for white collar workers as well, for marketing and administration, in return the investors will get the benefit of reducing the margin of loss and casualties, and proper selling of parts of dismantling. The authorities will invite specialized disposing companies to remove asbestos and gives asbestos free certificate against a fees from the demolition owner benefitting both companies, authorities invites oil cleaning companies to remove oil and issue gas free certificates, before dismantling starts, the investors will furnish docks for dismantling the ship, the investors build shops for selling the retrieved equipments from the demolition, renting these shops to traders, adding benefits to his, in return the authorities will impose sell tax. The authorities will invite construction companies to build housing for relocated workers drifted from their home towns seeking jobs, the construction companies will benefit from selling the housing , the investors can built hospitals, benefitting from cutting cost of treating the workers, also benefitting for treatment of personnel other than workers. The authorities invites investors to invest in schooling for workers children, the authorities can invite investors to participate in supplying the site with

energy, by using renewable energy, like solar energy and wind energy, which is available all around the year, the investors will benefit from selling electricity to sites, and also they can connect to the main national grid selling electricity to the authorities, resulting for all this the authorities will benefit from shifting a large number of population to new un-inhabitant sector, resulting in forming a medium size city which can accommodate one million inhabitant.

The sustainability of the ship recycling arise from ships in the market need to be scrapped, and also from oil rigs needed to decommission which is not done till the moment in any part of this area of the world.

Bottom line is that ships recycling is very suitable for this time of economic rebuilding in Egypt, despite the economic privilege, it will add a large number of jobs which is very much in need to reduce the unemployment line, adding a qualified personnel to the labor market, which can be used in another industry which is ships repairs, which can be built adjacent to ship breaking, benefitting from the results of the demolition, and using the same berths which is built for demolishing ships in the time when no enough ships for cutting. Once the demolition sites becomes sustainable, then shifting to ship repairs becomes easier and more profitable, keeping in mind that the existence of trained labour for cutting and professional dismantling provides a solid ground to build ship repair industry.

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