Development of an Assessment Model for Ship Recycling Industry in Bangladesh

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Abstract

Ship recycling habitually considered as the best means to dispose off a ship either at the end of her operational life or at any time as decided by the owner, regulatory bodies or law enforcement authority. South Asia is the global centre of ship breaking and recycling of End of Life (EOL) ships. Bangladesh has the prime share of recycling industry in the world. In Bangladesh, average 200 different types and of obsolete ships are recycled annually in different local recycling yards. In the present researcher it has been found that; average 2000000 LDT different types and sizes of obsolete ships are recycled annually in local yards in Bangladesh. Main problem of this sector is the restrictive nature, as well as lack of ground information. It's true that, very few studies have been completed so far; but mostly were based on limited preliminary information and assumption. That's why an extensive study is necessary to develop an assessment model for sustainable ship recycling industry of Bangladesh. It has been hoped that, local recycling industry of Bangladesh will be sustainable at future if proper guidance and professionalism can be enforced. This promising industry need continuous monitoring, balanced leadership, financing, guiding, motivation and whole hearted support from every corner from government and globe.

Keywords
Recycling, waste material, model, distribution channel, sustainable, etc.

Introduction
Disposing of a ship after its end of service life also leaves a huge amount of waste, posing a potential hazard to the environment. All physical systems undergo three essential phases in their entire life span. The initial phase is called as creation, the intermediate phase is known as sustenance and the final one is nothing but decay and the system ceases to function as it has been designed. For a ship the three natural phases of life cycle activities can be identified as, design and construction as creation, shipping operations as sustenance and dismantling as end of life (EOL). Ships are normally removed from the fleet after EOL through a process known as ship scrapping; decommissioning of ship; abandonment of ship; ship breaking; ship dismantling or ship recycling. Actually ship recycling is an engineering process [Hossain, 2015a] and more particularly a reverse engineering process of dismantling obsolete ship to recover reusable materials in a safe and environmental friendly way [Hossain, 2012 and Hossain, 2019]. Ship dismantling, also commonly referred to as ship "recycling", is an inherently sustainable activity, the benefits of which are felt at the global level.

Methodology
It is a research work to develop an assessment model for sustainable ship recycling industry in Bangladesh by analyzing on ground data [Stopford, 2009 and Hossain et al, 2018a]; which has collected by physical involvement of the author since last eight years. Data of the ship recycling activity were collected from actual ship recycling industry located in Chottogram and provided by the different stake holders as well as Bangladesh Ship Breakers Association (BSBA). The inventory of reusable and hazardous wastes materials from recycled ships was derived and compiled on the basis of collected data by author. Results have based on original on ground data and take considerable help/guideline from the methodology followed in available literature and research paper. Primary and basic data about output of material/component and hazardous material of different types of recycled ships has collected from the industry by physical involvement of the author [Hossain et al, 2012]. However, nuclear waste and other releases, such as emissions to atmospheric pollutants and diffuse emissions of pollutants to the water [and Basel Convention, 1989 and Hiremath et al, 2015], were not included in the scope of this research work. Total 26 in number of different types/category and sizes of EOL ships has been considered as sample to calculate the average annual amount of reusable materials output. For this research work, 5 bulk ships, 5 tanker, 6 container carrier, 5