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LIFE CYCLE ASSESSMENT (LCA) STUDY FOR CONSTRUCTION SECTOR

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ABSTRACT

The Life Cycle Assessment (LCA) is a suitable environmental management tool for analyzing and assessing the major environmental impacts that are caused through production, use and disposal of products used in construction industry. In order to make optimum use of the LCA tool all those concerned with construction must be familiar with its manner of application, its potential and its limitations. This paper highlights the guidelines with in frame work of ISO-14040 series for the uniform application of LCA for construction industry especially for conducting inventory analysis in the building material industry.

1.0 Introduction

Life Cycle Assessment (LCA) is very recently being used as an environmental management tool in India. The work of standardization of LCA has been started recently. It will take some time to get maturity and standardized, however Ministry of Environment and Forests (MoEF), Govt. of India has taken initiatives to carry out LCA studies in different major sectors like Steel, Coal, Paper, Power and Cement industry. All the studies have been completed. The MoEF had sponsored the project entitled "LCA Study for Cement Sector" to National Council for Cement & Building Materials (NCB). The study encompasses mining of limestone to dispatch of cement i.e. Cradle – to – Gate. NCB has made a sincere effort to evaluate not only input & output in terms of thermal & electrical energy, raw material & emission, but also its impact, independent of its geographical boundaries for cement plants.

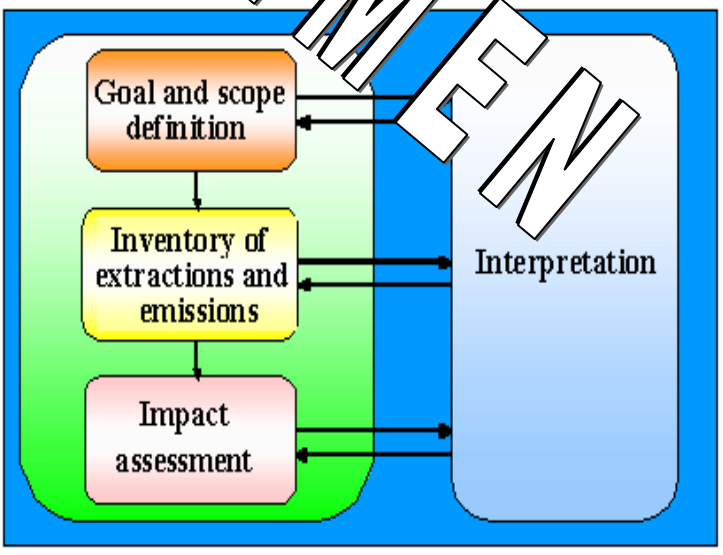

Fig-1: Framework of LCA

Experts from various institute and organizations appreciated the LCA study of Cement sector and the quality & quantum of work carried out but at the same time they had expressed their view to go beyond cement and to continue such type of study on concrete and covering utilization of

construction and demolished materials to enable further analyses of the fate of the concrete i.e. Gate – to – Grave and their impact on the environment. It will be a tough and challenging study to prepare Life Cycle Inventory for construction sector and to analyze various environmental impacts in terms of local, regional and global scale. It is a challenging assignment to bring environmental improvement/changes in construction sector. Under aegis MoEF New Delhi, NCB has taken up a project entitled "**Life Cycle Assessment for Construction Industry – Concrete (Gate – To – Grave).** Fig-1 and Fig-2 show framework of LCA and characterization and impact categories.

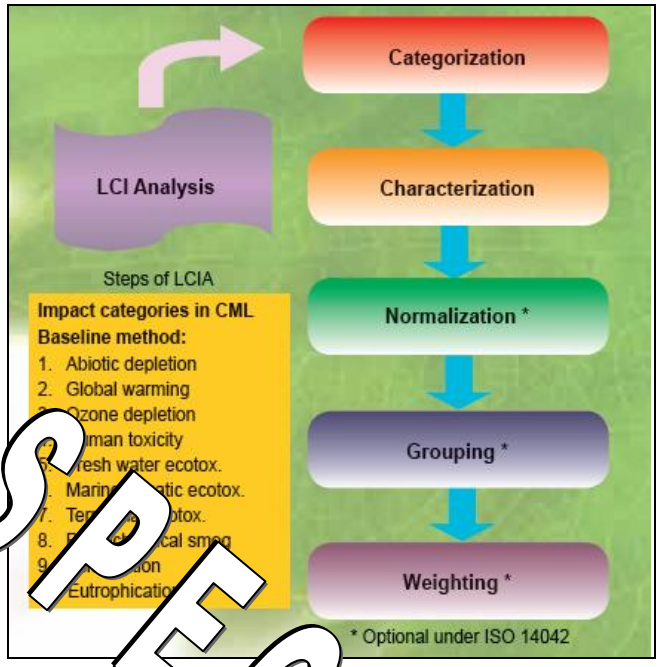

Fig-2 Characterization & Impact Categories

Progressive construction companies are recognizing that to remain competitive in the future, they must combine sound financial performance with a commitment to social responsibility, environmental stewardship, and economic prosperity. These three dimensions are referred to as the "Triple bottom line" of Sustainable Development. A number of construction companies all over the world have accepted the fundamental goals of SD, namely to "meet the needs of the present without compromising the ability of the future generations to meet their own needs". Over recent years, there has been an increasing concern on how human activities affect the loss of biodiversity, the thinning of stratospheric ozone, climate changes and the consumption of natural resources. The purpose of this LCA study is to assess the current status of the construction industry as a whole with respect to SD and to provide a vision to contribute to a more sustainable future for the Indian construction industry.

The most challenging aspect of the LCA study for construction industry will be data collection and its validation. The data will be collected by means of a quantitative physical survey that accounted for the raw materials, energy, water and waste associated with big civil construction project. It is emphasized from the beginning that the data would have to be obtained from numerous different sources. For the construction companies in this industry it will participate in an LCA inventory and assessment of impact on environment. This will raise awareness of environmental impacts within the building and construction activities. As a result, participation for life cycle information will become more common in contracts and specifications in their future construction project.