

# A Study on Aspects of Construction and Demolition Waste Management Practices in India

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**Abstract:** *With the rapid growth in construction activities, it is important to assess the amount of Construction and Demolition (C&D) waste being generated and analyze its disposal. C&D waste constitutes a major portion of solid waste production. Landfilling is the common method adopted for C&D waste disposal. Considering the environmental, socio-economic and sustainability impact, sustainable C&D waste management practices have been started globally. 3R (Reduce, Reuse, Recycle) method is the base for sustainable C&D waste management practices.*

**Keywords:** Demolition, Reduce, Reuse, Recycle

## 1. Introduction

The growth of Indian construction industry is enormous for the past few decades. The average growth rate of Indian construction industry is 7-8% per annum. It is one of the major contributors (approximately 10%) towards India's GDP employing over 35 million people. As the growth is increased, the waste produced by construction industry is also increased. Construction and demolition (C&D) waste means the waste comprising of building materials, debris and rubble resulting from construction, re-modeling, repair and demolition of any civil structure. Considering the mentioned scenarios for the construction and demolition waste (C&D waste), a more rational approach is needed to be worked upon which would efficiently manage the C&D waste in India.

## 2. Research Objectives

- 1) To study and summarize the international practices of C&D waste management (literature based).
- 2) To find out the effectiveness of recycled aggregate in the production of concrete (literature based study).
- 3) Finding out the barriers for recycling of C&D wastes in India through questionnaire survey.
- 4) To examine the process of construction and demolition waste management practices in India with the help of a questionnaire survey.
- 5) To check the effectiveness of the proposed guidelines on C&D waste management rules published in March 2016

## 3. Methodology

Based on that, the research used a carefully designed questionnaire survey to collect the information and perceived opinions on the current C&D waste management practices which is being followed in India and its limitations, current status of recycling of C&D wastes, its barriers and actions to promote recycling of C&D waste. Questionnaire survey was carried out in three possible ways. At first, construction professionals in and around the vicinity of Kozhikode were contacted and their response were noted down. Second was

the online survey, construction professions outside the city of Kozhikode and within India were the part of this round. Third was through telephonic interview, known construction professionals were covered in this section.

Semi structured interview with the Kozhikode City Corporation (MCC) officials was done to collect the details regarding the C&D waste management in MCC and to know the progress and effectiveness of the proposed guidelines on C&D waste management published in March 2016 by the Ministry of Environment, Interview with several construction professionals in Kozhikode was also done to collect the information's.

Weighted arithmetic mean method was adopted for analyzing the data. The results were plotted through histograms and pie charts.

### 3.1 Analysis method

Five point Likert scale was used in this research. Likert scale is used to gauge people's attitudes, values and opinions to a topic. It allows the individual to express how much they agree or disagree with a particular statement. To facilitate the analysis of responses to such questions, following numerical values were assigned to the 5 options based on the level of importance.

- 1 = Not important
- 2 = slightly important
- 3 = moderately important
- 4 = Very important
- 5 = extremely important

The questionnaire quantitative data analysis was done by using Microsoft Excel and the following statistical tool was used.

### 3.2 Weighted arithmetic mean

If some numbers want to have more weights then we will find the weighted mean. In calculation of arithmetic mean,

the importance of all the items is considered to be equal. The weighted arithmetic mean means some data points contribute more than others. In this research it was used to determine the relative ranking of different factors in a question based on their importance, as perceived by the respondents. If two or more factors happened to have the same mean score, the one with lowest standard deviation (SD) has to assign a higher rank.

#### 4. Result and Discussions

Total hundred (100) valid responses were obtained from the questionnaire survey. Out of 100 respondents, 50% of the respondents were from the Government projects, 39% of the respondents were working in private projects and the remaining 11% were working in public-private partnership (PPP) projects. All the respondents were asked to rate the Construction and Demolition(C&D) waste management attention given in their company as High, Moderate, Low and None. From the responses, it is observed that 53% respondents feel their company gives „moderate“ attention to C&D waste management. 24% respondents feel their company gives „high“ attention to C&D waste management. 21% respondents feel their company gives „low“ attention to C&D waste management and 2% of the respondents opined that their company paid no attention at all to C&D waste management. Regarding the C&D waste generation level, 71% responded that the C&D waste generation level in their company is less than 200 tons per month. 12% responded that the C&D waste generation level in their company is approximately zero. 9% responded that the C&D waste generation level in their company is 200-300 tons per month. 8% responded that the C&D waste generation level in their company is greater than 300 tons per month. Analysis of the survey result showed that the project goal of quality was considered by the respondents as most important (mean=4.48), timely delivery of the project as the second most important project goal and minimizing the impact of construction on environment as the least concerned. It can be understood by the survey that Indian construction industry is least concerned about environmental impacts of construction activities. Similarly construction companies are least concerned about the C&D waste management and disposal and the adverse effect of unscientific waste disposal.

#### 5. Conclusion

- C&D waste management is an emerging issue while considering its environmental and sustainability impacts. But, the awareness of C&D waste management in Indian construction industry is still at the minimum level.
- The research concludes that C&D waste management in India faces a lot of barriers for its proper implementation. Lack of awareness, improper planning of local authority and weakness in legislation are found to be the major barriers hindering the practices of C&D waste management
- Lack of proper standards, Lack of appropriately located recycling facilities and absence of appropriately located recycling centers are the major barriers for the recycling of C&D wastes in India.

- For the proper C&D waste management, the government and the construction industry has to work hand in hand. Government has to ensure the proper implementation of rules and formation of standards for the recycled materials in order to promote recycling.

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