

Forecasting of Demolished Construction Waste Materials and its Management

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Abstract –

Demolition waste is waste debris from destruction of a building. The debris varies from insulation, electrical wiring, rebar, wood, concrete and brick.

India has established itself as one of the world's fastest growing economies and this growth has brought with it a significant boost in construction activities. With the rapid growth in construction activities, it is important to assess the amount of demolition construction waste being generated and analyse the practices needed to handle waste in order to propose a sustainable construction approach.

The paper provides a forecasting, overview and management of waste generated from demolition of residential building. The project gives an overview of the current status as well as the future potential for waste minimization, explores how waste management practices can be effectively implemented.

Key Words: Construction and demolition waste, C&D, waste management, Waste forecasting, Residential buildings, Sustainable construction Waste.

1. INTRODUCTION

Responsible management of waste is an essential aspect of sustainable building. In this context, managing waste means eliminating waste where possible; minimizing waste where feasible; and reusing materials which might otherwise become waste. Solid waste management practices have identified the reduction, recycling, and reuse of wastes as essential for sustainable management of resources.

Most construction and demolition waste currently generated in the India is lawfully destined for disposal in landfills. In some areas all or part of construction and demolition waste stream is unlawfully deposited on land, or in natural drainages including water, contrary to regulations to protect human health, commerce and the environment. Businesses and citizens of the India legally dispose of millions of tons of building-related waste in solid waste landfills each year. Increasingly, significant volumes of construction related waste are removed from the waste stream through a process called diversion. Diverted materials are sorted for subsequent recycling, and in some cases reused. Volumes of building-related waste generated are significantly Influenced conditions affecting by macroeconomic construction, societal consumption trends, and natural and anthropogenic hazards. In recent years, construction industry awareness of disposal and reuse issues has been recognized to reduce volumes of construction and demolition waste disposed in landfills.

Many opportunities exist for the beneficial reduction and recovery of materials that would otherwise be destined for

disposal as waste. Construction industry professionals and building owners can educate and be educated about issues such as beneficial reuse, effective strategies for identification and separation of wastes, and economically viable means of promoting environmentally and socially appropriate means of reducing total waste disposed. Organizations and governments can assume stewardship responsibilities for the orderly, reasonable, and effective disposal of building-related waste, promotion of public and industry awareness of disposal issues, and providing stable business-friendly environments for collecting, processing, and repurposing of wastes. Businesses can create value through the return of wastes back to manufacturing processes, promoting and seeking out opportunities for incorporation of recycled materials into products, and prioritizing reduction of building related wastes through efficient jobsite practices.

2. Literature Review

Title - Construction and Demolition waste – An Overview of Construction Industry in India Author – Roshan S. Shetty

The paper gives an overview of the current status as well as the future potential for waste minimization, explores how waste management practices can be effectively implemented in construction projects. India has established itself as one of the world's fastest growing economies and this growth has brought with it a significant boost in construction activities. With the rapid growth in construction activities, it is important to assess the amount of construction and demolition waste being generated and analyses the practices needed to handle waste in order to propose a sustainable construction approach. It has become essential to study C & D waste generation and handling to develop accurate data and establish sustainable methods to manage construction waste. Reduce, Reuse and Recycle [3R's] is highly useful in handling of construction and demolition waste.

Title - Waste Management at construction site Author - Joseph Laquatra

The publication focuses on assisting builders in determining both cost-effective and environmentally sound methods for handling and getting rid of construction wastes. To provide accurate, unbiased information that home builders can use to design and implement waste management techniques specific to their firm's unique circumstances and requirements.

Competition in the home-building industry is intense. Profit margins are slim, especially when the price of each house is often set before construction begins. This makes cost control and efficient use of time extremely critical during the construction process. The construction of a single-family home typically produces over two tons of debris material that is becoming increasingly difficult and expensive to discard. Some waste disposal facilities are refusing to accept construction and demolition debris. In fact, a survey of home builders indicated that waste disposal costs negatively affect the economic health of their companies. In response to this situation, progressive and successful builders across the United States are now implementing waste management programs as a critical component of the construction process.

Title- Analysis and Forecast of Construction Waste Based on ARIMA Model Author - Song Zhaoxiang

In the construction waste output forecast, it is difficult for forecasting and reducing the accuracy of forecasting. In this paper, a method for estimating the yield of urban construction waste is built on the basis of building area, by using the ARIMA model to predict demolition area and the area of the building was completed, from the empirical coefficient method and indirect method to predict for construction waste production. Haikou as an example to calculate and predict the 2015-2020 years of urban construction waste output.

Title - Construction and Demolition Waste Management in India Author - Harish. P. Gayakwad

This paper current global status of construction and demolition waste management is overviewed and also the sustainable waste management hierarchy is studied so to overcome the waste problem. The construction industry has gained very fast growth in recent decades due to the increase in the population, increase in the IT sector and increase in the industrialization and also introduction of new infrastructure projects resulted in the increase of construction industry drastically. Due to which the demand for construction materials is huge for the construction activities which results in the generation of huge amount of construction waste. Construction material wastage resulted in the huge financial setbacks to builders, contractors, regionals authorities and also to the country's. The production of waste due to the demolition of structures is more than the wastage which occurs during construction of structures, so there is need of management of Construction and Demolition (C&D) wastes, as distinct from Municipal Solid wastes, is a relatively new subject in India. To begin with the issue there is no proper estimate regarding the quantity of waste occurs in India. The primary reason is being in disciplinary and less focused in this issue. In this problem there is absence of regulatory framework and strict enforcement. Specific recommendations has made in this paper to overcome the loop holes in the issue.

3. Scope, Methodology, Purpose.

Scope :-

Following are the objectives of the proposed dissertation work.

- 1) To study the suitable approach for reducing, reusing and recycling the Demolished Construction Waste Materials (DCWM) in construction project.
- 2) To quantify the materials that can reused from DCWM.
- 3) To find suitable approach for forecasting the DCWM in construction project.
- 4) To forecast the quantity of DCWM for residential buildings with serviceable life of 50 years.
- 5) To suggest the measures to manage the DCWM.

Methodology:-

For this dissertation work it is proposed to carry out the work in the following phases.

- a) To collect information related to DCWM through literature review and or preliminary study on site.
- b) To compare different forecasting methods in order to identify the suitable method for the study.
- c) To collect data on selected case studies in formats devised in the same regards.
- d) To analyse the data to predict and forecast the quantity of DCWM by proposed forecasting method and suggest measures to effectively manage DCWM.
- e) Validation of the method for selected case studies.

Purpose of dissertation:-

Since past five decades with advancement in concrete technology, the numbers of construction projects undertaken are increasing day by day. As we know every building or project has definite serviceable lifespan, after which each building has to be demolished to make way for new construction. The materials from buildings demolished is generally called debris has no value. Different studies are carried out to identify methods to reuse the construction Waste Materials, but there is little study carried to quantify the waste construction materials

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