

LITERATURE REVIEW ON MINIMIZATION OF CONSTRUCTION WASTE

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ABSTRACT

Minimization of waste in the construction industry is a major topic in the construction management field. Construction companies' benefit from reduced waste generation by lower deposition costs and lower purchasing costs of virgin materials. Now a days construction waste management is a worldwide issue that concerns not only the on-site construction management but also the sustainable development direction of construction industry. The quantification of construction waste volume, at the project stage, is essential for the building practitioners to properly plan and control the disposal. A detailed model is established to estimate the on-site volume of construction waste for new building project. This paper presents a review on various research work done in the area of minimization total construction waste.

Keyword : Construction waste, waste minimization, sustainable development, construction project

1. INTRODUCTION

The increasing quantities of waste have created a bad image for the construction industry. In addition, an ineffective planning and control of materials on sites could lead to poor performance and undesirable project outcomes. Nevertheless, the economic impact, contributions to employment and the benefits of investment in construction industry are very enormous. Construction activities result in the depletion of limited natural resources. Construction material contributes significantly to the cost of construction project; therefore, material wastage has adverse impact on construction cost, contractor's profit, construction duration and can be a possible source of dispute among parties to a project. Prevention of waste generation in the construction industry has been a great issue. The cost reduction achieved by preventing the generation of construction waste is equally of direct benefit to all stakeholders of a construction project.

1.1 Review of Literature related to Study of construction waste

Elizar(2015) The construction industry facing major issue that was the construction waste generated in their field. Their great impact on cost, time, productivity and sustainability etc. It greatly affected by the practitioners and researchers around the world. In construction waste management studies consist identifying, analyzing and managing construction waste during the construction project. Reducing the construction waste their by achieving successful completion of the project significantly. In this study effective factors were identified that are coded as critical success factors for managing the waste and then rank the factors. This paper proposes a new concept that helps to improve the performance level of a project and construction waste management practices. Main waste due to the design change, slow in making decisions and lack of skilled labours that are the three most important variables causing waste during the construction process. Biased on this work, 5 variables and 22 indicators were identified to improve waste construction management.

Ghanima A. Bekr (2014) This study find out the causes and magnitude of wastage of materials on construction sites in Jordan. He had prepared a questionnaire form it includes questions about the causes of wastage generated in sites and the estimated percentages of wastage of ten most important materials used on construction sites. A pilot survey was conducted in the study. The questionnaire form was distributed to 240 participants mainly for clients, contractors, and consultants. The main objective of the research is to identify the major causes of material waste generated on construction sites. It was calculated based on the 240 participants opinions and also take the quantities of waste in main building materials used in the sites. Finally making a comparison with the other countries. The

result of his study is that, the percentage of wastage materials is accounted for by values between 15% and 21% on Jordanian sites.

Jiayuan Wang (2014) The construction waste is world wide issue which effected by all construction site. It has to create a huge loss to the contractors or builders. They are inefficient for controlling waste management during the construction project. Many contractors and builders are facing the problem in how to prevent or reduce the wastes in the best way. So in this situation, the project managers should require further studies such as waste management regulations, waste management systems, awareness of waste management, low waste building technologies, fewer design changes, research and development in waste management. This kind of studies can achieve the performance level of project and also it can control or decrease the unnecessary waste. Project management needs to advise to the workers about their various studies of waste management programs, plans, waste of minimization method of construction in a construction project. Such knowledge implement there to improve the construction waste management of there performance.

Mahesh D. Meghani (2011) In Construction, 4-M (Material, Manpower, Money, Machine) play an important role. Material waste has been recognized as a main waste generated in the construction industry. The data to be collected from 5 building sites located in different location in India. In housing project building materials account for 60 to 70% of the project cost. The function of waste management is maximum utilization of resources (Material) and reduce the overall project cost. Waste includes both the incidence of material losses and the execution of unnecessary work, which creates additional costs but do not add this value to the product (Koskela 1992) which ultimately effected on total project profit. In this study to compare the material wastage on different construction site in Gujarat and to give necessary suggestion for reduce waste at work site.

Sasitharan Nagapan(2013) The construction industry plays an important role in Malaysia. Present developments create a lot of harmful and negative environmental impacts to the ecosystem. Main aim of this study are to identify the construction waste generation on site and to determine the construction waste management plan that have been applied in the same project. The study contain two type of data collection by interviews and site observation. This study was conducted at three sites, in two month duration. The study results, mainly six types of waste produced in sites that are timber, metal, concrete, mortar, packaging waste and bricks. Finally quantifying these waste at the site. There by study on construction Waste Management Plan at sites and to minimize the waste.

S. E. Sapuay(2016) Construction industry is major source of producing waste. To maintain the environment by dispose of construction solid waste from their working area. demolition waste is a major waste in some construction industry. Contractor is the responsible person to manage the construction waste in site. This paper mainly focused on the issues of construction wastes encountered in projects and how these waste can be reused in the work site. Under this study an ecological solid waste management has been improved.

1.2.Review of Literature related Construction waste minimization methods

Noraziah Wahia(2015) Construction waste from construction site if negatively affected environment. These negative impacts cause many problems so productions of construction waste need to be controlled and managed by the stakeholders in the construction industry. This paper shows waste management system in Hong Kong and Malaysia. It also shows differences and similarities in two countries. Also these study deals with management system in future aspects. This study is the keyword for reducing waste in Malaysia and the precise source for how to reduce waste management system. In conclusion, there are still many efforts that the Malaysian government can undertake by taking Hong Kong as a role model to tackle the C&D wastes issue. The proper waste management system helps to make these countries very popular. This paper suggests that improve waste management system. Facilities to support waste management particularly in recycling need upgrading and improvement. Enforcement by the government is essential to ensure that the requirements and standards are fulfilled.

R. B. Surve(2013) The study aims to knowing the sources and causes of construction waste occurrence. The waste generated on construction site has been found to result in financial losses i.e. the cost of transporting and disposing of site waste and material storage cost. In this research the study of construction waste generation at different types of construction sites like commercial, residential and industrial sites was done and the data regarding waste generation sources and average waste generation was done. Also in this project route optimization for selected sites is carried out using GIS application.

Roseline Ikau(2016) Material wastes generated from construction activities is increasing day by day. The main objective of this paper was to determine the current various factors causing construction waste generated in Malaysian construction site. The study followed by a structured questionnaire focusing to contractors engaged in various types of construction projects in Malaysia . Data was analyzed with Statistical Software Package. Biased on some important waste generated factors questionnaire was constructed. Further study biased on sustainable waste control that connected to the construction waste minimization. The findings from the study would increase awareness about the waste created at the site and to adopt sustainable waste control practices.

Ruane Fernandes de Magalhaes (2017) The construction industry is known as a source of negative environmental impacts it producing waste to the environment, and its impacts have increased with the development process of cities. This study was developed from the need to reduce environmental and economic impacts caused by material waste in urban infrastructure projects. Main aim of the study was the identification of best practices to support the design stage and to minimize the waste .This study presents best practices to reduce waste in the current projects and to avoid the stress the role of decision-making in the design stage. The best practices were identified from literature review, document analysis in 14 projects of urban infrastructure, and both qualitative and quantitative survey with 18 experts .

Ryszard Dachowskia (2016) Waste material will create many environment issues so contractors needed very important ways to avoid this problem. Generally they are reusing and recycling. They can use waste foam glass and high impact polystyrene, its good effect to reduce sound and workability. The goal of the study was to determine the effectiveness of additives based on physical and mechanical quality microstructures of newly created materials. In this studies based of modified cement mortar and effects of additives in bulk density, flurry strength, compressive street and water absorption.

Saeed Banihashemi (2017) During this period, great care should be provided to sustainable built environment. The objective of this study is ,introducing an approach in construction waste optimization through increasing in the sustainable environment. Modular Coordination is an important factor in deploying offsite construction. The method that leads to production in order to get integrated design based on a basic element or component, encourage parties involved in building construction industry. Major benefits to facilitate productivity to reduce productivity to minimize environmental impacts such as transfer of projects through MC results algorithm was developed based on Parametric design and modular coordination standards. That is, the facts are fake, and the facts can not actually apply to real things, making a hypothetical report. Furthermore, the developed algorithm will help to reach the lowest desktops in the interval to reduce the bandwidth limit. This causes further inquiries and validation.

Saheed O (2017) In the construction sites there is a huge amount of construction waste. In this case project management should be activities, including the design, materials project, and the construction phases of the Project delivery such kind of study needed . This study involves physical storage and logistical means to minimize the waste generated by construction activities and also involve methodology of explanatory research and research surveys in its methodological framework to understand the phenomenon of the perspective of the industry of the construction industry. Low waste management, low waste storage management, effective material delivery management, waste wastage quota etc. The findings of this study will help us to understand a set of steps that should be taken in the process of procurement of objects. . In industry, it is important to try to waste the waste in other aspects of the project delivery process, as you do in the construction phase. Measures will be taken to waste more than 50% of the cost of purchase of premiums, purchase and purchase process during the delivery process, and more than project costs. This can be achieved through wasting efficient purchase management, design compensation purchasing and waste waste management services.

WeishengLu(2016) In this study develops and tests an S-curve model that indicate accumulative waste generation as a project progresses. This is used for forecasting waste at the site. The S-curve model is then further linked to project characteristics using artificial neural networks (ANNs) so that it can be used to forecast waste generation in future construction projects-curve method is fit for logistic way. S-curve provides detailed forecasting and benchmark for recycling. The major contribution is forecasting waste management. S-curve modeling is accepted as standard tool. S-curve also provides scientific evidence for construction waste management.

Ying-Ying Lai (2016) This paper contains Taiwan construction waste management (CWM) practices and reuse status. Global warming lead to the world's climate change. Now days new buildings upcoming and existing are collapsed these cause to increase waste. Some materials are renewable and these are used to future purposes. In recent years, 2 million tons of construction waste is generated each year in Taiwan. The Construction waste must be transported to the treatment facilities

1.3 Review of Literature related to the Modelling of processing construction waste

anagementHongping Yuan (2012) Construction and demolition (C&D) waste has received increasing attention from construction practitioners and researchers. A model is important because reduce the waste and strategies for C&D waste reduction. In contain dynamic approach which integrates major variables included in C&D. this research contains such loops. These loops firstly contain relationship in C&D then stock flow finally case study for validation. One major contribution of this study is the development of a dynamic model for evaluating C&D waste reduction strategies under various scenarios. these project aim into a inter relationship between variables. The contributions of this study mainly lie in three dimensions. Firstly, the causal loop diagram delineating the interconnected relationships among major variables. Secondly, the established model in stock-flow diagram. Finally, the results of the case study provide insights into the measures that could play a role in reducing C&D waste of the project.

Larisa S Grigor'eva (2016) Foreign and domestic experience shows that to avoid the negative consequences of the formation and accumulation of construction waste can only be based on all the processes of collection management, sorting, and transport and recycling, the proper planning of waste management system helps to predict stable value of system. Such calculations are important for easy management of construction field in the case of waste management. This system includes two major subsystems. The first subsystem the collection, sorting and transportation of construction waste. The second subsystem recycling of construction waste. which gives a clear view of the model and algorithm of the system.

2. CONCLUSIONS

Construction and demolition waste is a major source of urban solid waste. Construction waste management is currently a worldwide issue that concerns not only the on-site construction management but also the sustainable development direction of construction industry. There is a recognized need to manage the construction waste in order to maintain a sustainable environment. The successful implementation of construction waste management depends on a number of factors. The quantification of construction waste volume, at the project stage, is essential for the building practitioners to properly plan and control the disposal. All literatures states about identification and minimization of construction waste but not states about their quantification and impact over the organization.

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