

## A Review: The Impact of Waste On Cost Overrun in Construction Projects

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**ABSTRACT:** Construction waste can be divided into both physical and non-physical waste. Physical waste refers to all solid construction materials waste, while the non-physical waste refers to waste that accrued during the construction process and raises time and cost overruns. Improper waste management may lead to cost overrun. Therefore, the management of waste should be considered as early as the pre-contract stage. This study aims to highlight waste and wasted material in construction projects, causes, and sources. In addition, there are different strategies suggested by the research to help project managers to manage waste materials in their projects. Here are two types of methods to reduce waste materials in construction projects: planning and controlling. Planning includes the materials procurement, design project plan and site planning. In contrast, material transportation and handle, security and storing, waste accounting, documentation, safety, educational, training, and equipment maintenance are all examples of controlling. Material waste planning is critical for reducing or reusing waste in construction projects.

**Keywords:** *waste; physical and non-physical waste; cost overrun*

### 1. INTRODUCTION

Construction waste can be defined as any constituent generated due to construction activity that has been abandoned, regardless of whether it is processed or stored prior to disposal [1]. From the perspective of research, the construction waste, on the other hand is defined as any human activity that represents the amount of money and does not provide value, such as rectification errors, waiting time, expenditures, undesired production, work programme management, and bad construction [2]. It is also suggested that the construction waste should include delays, cost of the quality inspections, absence of safety, rework, wasteful transportation travels, vast distances, improper management alternatives, methods or equipment, and poor project quality [3].

### 2. CONSTRUCTION WASTE

Construction waste is one of the major issues that

happen in the construction industries. Indeed, construction waste could be generated from the perspective of supervision time, waiting time, accident on site, traveling or logistic time and worker rest time. In Indonesia, the common waste was identified as double handling, waiting time for materials, delayed schedule, inefficiency or sluggishness in the workplace. However, in Singapore, it is found that labour inefficiency, machinery ineffectiveness, material trash, excess material inventory, and rework were the major construction waste [4]. India on the other hand, suggested waiting time due to crew interference, inspection equipment used by other crews, equipment installation, and instructions were the main issues on construction waste [5]. In addition, waste due to late details, waste due to unfinished design, waste due to poor control, waste due to unnecessary movement of people and waste due to untrained labour has been identified as the most important waste in construction projects in Egypt, according to the study [6]. Another research in Korea found that the most significant wastes were: rework, conflicting, inaccurate orders and accounts, estimation of gaps between field and office, delay in decision-making [6]. Given the above, various studies have agreed that the construction sector suffers from construction waste, which impacts the success of the sector and other problems related to time overruns [7] and [8].

### 3. WASTE IN CONSTRUCTION PROJECTS

In the construction industry, waste of materials has become a severe problem that requires prompt response, which affects the execution of many projects [9]. It is regarded one of the causes of cost overrun in building projects during the pre-contract and post-contract stages of a project. Within the two phases, the activities involved should be monitored and managed to minimize the amount of material waste that will result in project cost overrun. A project's pre-contract stage includes feasibility studies, planned proposals, scheme design, detail design, quantity/estimation bills, and so on [10]. While a project's post-contract stage includes: on-site construction, monitoring, review, permits, assessments, accomplishment, handing over to client and user occupation, modification of defects and fulfilment of contract conditions and final account settlement [11].

The study [11] revealed that the causes of material waste during a project's pre-contract stage are the same causes of cost overrun. While the causes of cost overrun should not be the causes of the waste material. Just 96.88% of the cost overrun factors are sources of waste material. On the other hand, the result in a project's post-contract stage showed that only 81.80% of cost overrun causes are causes of material waste. The post-contract phase of projects is the primary source of material waste, contributing to cost overruns in construction projects. There were three main stages in the post-contract stage: quality of procurement management, construction management quality and site management quality [12].

#### 4. CONSTRUCTION WASTE MANAGEMENT

The practice of waste management for construction activities was encouraged to protect the environment and understand that construction and demolition waste contributes significantly to the contaminated environment. These wastes need to be minimized due to two reasons for construction: the economic benefits and the environmental advantages. The economic advantages are lower project costs, higher corporate patronage, and lower risk of lawsuits involving waste. However, environmental benefits include lowering the risk of immediate and future emissions and harm to human health. There are two types of construction projects management to reduce material waste, such as planning and controlling. Planning includes the procurement of materials, design schedule and layout of sites [13]. Thus, control includes: distribution and handling of materials, accounting for the protection and storage of waste, record-keeping, safety, training and machinery maintenance [13]. Construction projects need regular policies to minimize material waste, such as site waste management plan, pay as you throw, and land-fill ban, according to study results [14] in Nigeria.

#### 5. CONCLUSIONS

In order to minimize construction waste, it is vital to important to identify the causes of waste prior in apply suitable strategies in reducing the impact of waste management. In the case of construction projects, the causes of waste depending on the source of the waste to be controlled and managed. It is important to monitor waste management throughout the project life cycle. The planning and monitoring as early as the pre-contract stage is the key to waste management that would minimize the risk of cost overrun.

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