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A SYSTEM DYNAMICS-BASED ECONOMIC PERFORMANCE SIMULATION OF CONSTRUCTION WASTE REDUCTION MANAGEMENT: EFFECTIVE APPLICATION OF PREFABRICATION

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Abstract

Cost effective management of construction and demolition waste (C&DW) has become a serious issue with increased construction activity and modern urban lifestyle which is damaging environment, eating up resources and causing rapid land use changes. These factors have influenced the construction industry significantly and therefore gained the practitioners' attention in recent past. New strategies of C&DW reduction management are being devised and reported; this research aims at providing a better C&DW management technique which will benefit the construction industry in terms of waste reduction and consequent cost-benefit. The main focus of this research is restrained to prefabrication of construction material and its effects on economy of tall buildings. The data collected from traditional methods for CDW management and prefabrication factories is based on interviewed surveys from project managers, quantity surveyors and experienced site managers. The collected data is then processed into System dynamics using "VENSIM PLE" by creating causal relationships with dependent and independent variables. Economic theory in contrast with conventional and prefabrication methods of construction has been incorporated in this study. Results show that usage of prefabrication technique proves to be more economical in managing C&DW. Construction waste management through prefabrication technique shows a reduction of cost around 79% as compared to that in construction through conventional methods. This suggests that prefabrication technique can considerably reduce C&DW as well as costs for its management accordingly.

Key words: construction and demolition waste, recycling, economic performance, system dynamics, prefabrication

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