

Factor Affecting Waste Generation in Construction Industry

Vishalkumar R.Gajera¹ Vyom B.Pathak² Rushabh A.Shah³

¹P.G. Student ²Research Scholar ^{2,3}Assistant Professor

^{2,3}Civil Engineering Department

^{1,2,3}S.N.P.I.T.&R.C .Umarakh

Abstract— The management of construction waste is important today. The scarcity in the availability of aggregate for the production of concrete is one of the important problems facing by the construction industry. Appropriate use of the construction waste is a solution to the fast degradation of virgin raw materials in the construction industry. This paper aims to various factors which affects the construction project of the south Gujarat region of India.

Key words: Building Sites, Construction Waste, Evaluation, factor of waste generation.

I. INTRODUCTION

Waste generation is a common phenomenon in construction industry today. It has adverse impacts on the environment and surroundings. Besides that, it has also accounted for negative effects on cost, productivity, time, social and economy of the industry. There are various factors that cause construction waste generation at different stages of project. In a research, revealed that construction waste is effectively generated along the project from start until completion of construction work. It can be emanated during design, operational, material handling and procurement. Some researchers highlighted that construction waste is commonly generated during design and construction stage cited that 33% of on-site waste is due to architects' failure to implement waste reduction measures during design stages.

Waste is one of the serious problems in construction industry. Many researchers and practitioners indicate that there are many wasteful activities during design and construction process. Wahab and Nawal described waste emanates during different stages of construction which are during planning, estimating and construction stage. Furthermore, Ekanayake and Ofori shows waste occur during design, operational, procurement and material handling. The majority of these consuming time and effort without adding value for the client thus resulting losses in material, delay times and execution of unnecessary work. Waste has direct impact on the productivity, material loss and completion time of project which resulting in loss of a significant amount of revenue.

This study aimed to find out critical factors of waste generation by listing various factors from literature review and personal interview. Questionnaire was prepared and distributed among the various Project manager, Developer, Site engineer and Contractors.

Questionnaire was divided into the 5 parts. Part A: Respondent details, Part B : Quantity of Wastage, Part C: How you utilize waste material on your site, Part D: Site Waste Management Plan (SWMP), Part E: Factor of waste generation Part E is further divided into 7 parts. The various factors that affect the site waste generation of construction in listed into Table no I

(1)	Design
1	Design errors
2	Poor design quality

3	Complicated design
4	Inexperience designer
5	Last minute client requirements
6	Poor coordination of parties during design stage
(2)	Handling
7	Wrong material storage
8	Poor material handling
9	Damage during Transportation
10	Poor quality of materials
11	Equipment failure
12	Inefficient methods of unloading
13	Materials supplied in loose form
(3)	Workers
14	Workers' mistakes during construction
15	Damage caused by workers
16	Poor attitudes of workers
17	Lack of experience
18	Inappropriate use of materials
19	Poor workmanship
20	Inventory of materials not well documented
21	Shortage of skilled workers
22	Too much overtime for workers
(4)	Management
23	Poor planning
24	Poor controlling
25	Poor site management
26	Poor information quality
27	Late information flow among parties
28	Lack of waste management plans
29	Rework
30	Outdated equipment
31	Lack of knowledge about construction
32	Lack of influence of contractors
(5)	Site Condition
33	Leftover materials on site
34	Waste resulting from packaging
35	Poor site condition
36	Difficulties accessing construction sites
(6)	Procurement
37	Ordering errors
38	Items not in compliance with specification
39	Mistakes in quantity surveys
40	Supplier errors
41	Wrong material delivery procedures
42	Over allowances
43	Frequent variation orders
(7)	External Factor
44	Effect of weather
45	Accidents
46	Damages caused by third parties

Table 1: Factors Affecting Waste Generation In Construction Industry

II. RESULTS ANALYSIS

To find out the critical factor analysis was done through the RII and IMPI. Total 400 questionnaires were distributed to contractor, developers, project manager and site engineer from which total 277 were received. The factors are then analyzed through the RII and IMPI. The rank is given based on the mean of the respondent. The top five factors are listed below with the mean of it.

NO.	Factors affecting Waste Generation	RII
1	Inexperience designer	0.792419
2	Design errors	0.778881
3	Poor planning	0.761733
4	Poor controlling	0.751805
5	Ordering errors	0.738267

Table 2: Top Five Factor of Waste Generation By RII Method.

NO.	Factors affecting Waste Generation	IMPI
1	Poor planning	48.62609
2	Design errors	47.43081
3	Inexperience designer	44.53767
4	Poor quality of materials	44.16502
5	Poor workmanship	43.2932

Table 3: Top Five Factor of Waste Generation By IMPI Method.

III. CONCLUSION

As per Relative Importance Index and Importance Index techniques, we analyzed the most important factor which may create problem in construction industry. It is difficult, but it is not impossible to completely avoid construction waste. However, minimizing their impact brings many advantages, such as reducing wastage of material, manpower and reduced overall cost of project.

REFERENCES

[1] B. Wahab and A. F. Lawal, "An Evaluation of Waste Control Measures in Construction Industry in Nigeria,"

[2] G. Bossink and H. J. H. Brouwers, "Construction Waste: Quantification and Source Evaluation," Journal of A. Serpell, et al., "Characterization of Waste in Building Construction Projects," in 3rd Annual Conference of the

[3] Abhijith H., Sreejith M.H., Jacob P.A., Aiswarya S "Minimizing Construction Wastes by Efficient Site Practices". International Journal of Education and Applied Research, ISSN: 2348-0033 (Online) ISSN : 2249-4944 (Print), 2014 African Journal of Environmental Science and Technology, vol. 5, pp. 246-254, 2011.

[4] Baabereyir A. Ph. D Thesis "Urban Environmental Problems in Ghana: A Case Study of Social and Environmental Injustice in Solid Waste Management in Accra and Sekondi-Takoradi" to School of Geography, University of Nottingham.

[5] C. S. Poon, "Reducing Construction Waste," Journal of Waste Management. vol. 27, pp. 1715-1716, 2007.

[6] C. S. Poon, et al., "Management of Construction Waste in Public Housing Projects in Hong Kong," Journal.

[7] Construction waste management in India Job Thomas¹, Wilson P. M.² Division of Civil Engineering, School of Engineering, Cochin University of Science and Technology, Kochi, Kerala, India, PIN 682022.

[8] Construction Waste Quantification and Benchmarking : A Study in Klang Valley, Malaysia-Alrmaid Finaan Masudil*, Che Rosmani Che Hassan', Noo, ZalinaMahnood², Siti Nazziera Moklrtar² Construction, pp. 365–377, 1994.

[9] D. Fatta, et al., "Generation and Management of Construction and Demolition Waste in Greece: An Existing.

[10] E. M. Nazech, et al., "Identification of Construction Waste in Road and Highway Construction Projects," in 11th East Asia-Pacific Conference on Engineering and Construction, 2008. Engineering (FKAAS) Digest, vol.1, pp. 15–20, 2012.

[11] Evaluation Of Cause Of Construction Material Waste - - Case Of Rivers State, Nigeria Adewuyi, T.O. and Otali, M.

[12] O. F. Kofoworola and S. H. Gheewal, "Estimation of Construction Waste Generation and Management in Proceeding of International Conference on Advancement in Design, Construction, Construction Management and Maintenance of Building Structure, Bali, (2002).

[13] R. A. Begum, et al., "Waste Generation and Recycling: Comparison of Conventional and Industrialized Building 124-130, 2000.

[14] R. M. Gavilan and L. E. Bernold, "Source Evaluation of solid waste in building construction," Journal of S. Nagapan et al., "Construction Waste Management: Malaysian Perspective," in International Conference on Civil.