

Investigation of Prefabricated Building System in Indian Construction

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Abstract: *The construction industry contributes almost 9% to the country's GDP, employing over 51 million people is relatively backward to meet people's housing demand. To meet the housing demand prefabrication technique is adopted. An extensive literature study was carried out, and this paper reviews the history, characteristic features of prefabrication technology, and the significant parts that construction companies should concentrate on prefabrication are emphasized. Prefabrication is the assembly of structures or components at a place other than the construction site. This paper suggests that prefabricated structures can deliver high-order design within the framework of managed waste reduction, renewable system integration, and optimal performance.*

Keywords: Building System

REFERENCES

- [1]. Dinoj K. Tony and R. Kokila, "Study on Prefabrication Technique in Construction and its Barriers" - <http://www.trp.org.in/wp-content/uploads/2018/06/TARCE-Vol.7-No.1-January-June2018-pp.-40-43.pdf>
- [2]. Lei Jiang, Zhongfu Li, Long Li* and Yunli Gao, "Constraints on the Promotion of Prefabricated Construction in China" - Sustainability 2018, 10, 2516. doi: 10.3390/su10072516
- [3]. Neha Gupta, Mohammad Arif Kamal, Tejwant Singh Brar (2021), "Exploration of prefabricated building system in housing construction" - J. Build. Mater. Struct 8: February 2021, 19-31. doi: 10.5281/zenodo.4567209
- [4]. Research and Application of the Modernization Technology of the Full Assembly Building Industry and Analysis of the Economic Benefit. Green Building Alliance Conference and Green Building Technology Forum in Cold and Cold Regions.
- [5]. Raja Bhushan Kumar Mogadala, Dr. C. Rajasekaran, "Study on Methods of Precast Systems for Indian Construction Industry" - International Journal of Scientific & Engineering Research Volume 9, Issue 4, April-2018. <https://www.ijser.org/researchpaper/Study-on-Methods-ofPrecast-Systems-for-Indian-Construction-Industry.pdf>
- [6]. T. Gunawardena, P. Mendis and T. Ngo, L. Aye and J. Alfano (2014) "Sustainable Prefabricated Modular Buildings" - 5 th International Conference on Sustainable Built Environment, 2014, doi: 10.13140/2.1.4847.3920
- [7]. Li Z, Shen G Q, Xue X. Critical review of the research on the management of prefabricated construction[J]. Habitat International, July 2014, Volume 43, p.240-249. doi: 10.1016/j.habitatint.2014.04.001 Indian Journal of Science and Technology
- [8]. S. K. Singh, Sara Ali, Utkarsh Singh "Prefabrication Building Construction: An Indian Perspective" - NBM & CW Infra Construction and Equipment Magazine. <https://www.nbmcw.com/product-technology/precast/prefabrication-building-construction-anindian-perspective.html>
- [9]. Ryan E. Smith Assistant Professor, Shilpa Narayanamurthy Graduate Researcher, "Prefabrication in Developing Countries: A Case study of India" - <http://uresmobe.myddns.me/615.html>
- [10]. Ana Stanojevic, "Planning of installations in prefabricated buildings" - TEHNIKA – NAŠE GRAĐEVINARSTVO 68, 2014. https://www.academia.edu/62337914/Planning_of_installations_in_prefabricated_buildings
- [11]. Jingjing Liu and Zuxu Zou, "Application of BIM technology in prefabricated buildings" - Published under licence by IOP Publishing Ltd IOP Conference Series: Earth and Environmental Science, Volume 787, 5th International Conference on Civil Engineering, Architectural and Environmental Engineering 23-25 April, Chengdu, China 12.

- Alena Tažiková, Zuzana Struková, "The Impact of Logistics on The Cost of Prefabricated Construction" - International Scientific Journal about Logistics Volume: 8, 2021, Issue: 1, p.65- 71. doi: 10.22306/al.v8i1.204
- [12]. Ouyang Ting, "Analysis on prefabricated construction technology of residence" - Journal of Physics: Conference Series 1939 012084; Bristol Vol. 1939, Iss. 1, (May 2021). doi: 10.1088/1742-6596/1939/1/012084
- [13]. Arif, M, Bendi, D, Sawhney, A and Iyer, K C, "State of offsite construction in India drivers and barriers"- 25th International Congress on Condition Monitoring and Diagnostic Engineering IOP Publishing Journal of Physics, 2012. <http://dx.doi.org/10.1088/1742-6596/364/1/012109>
- [14]. Xiao-Juan LI, "Research On Investment Risk Influence Factors Of Prefabricated Building Projects" - Journal of Civil Engineering and Management 2020 Volume 26 Issue 7: p.599–613. doi: 10.3846/jcem.2020.12917
- [15]. Na Lou and Jingjuan Guo – Hindawi, "Study on Key Cost Drivers of Prefabricated Buildings Based on System Dynamics" Advances in Civil Engineering Volume 2020. <https://doi.org/10.1155/2020/8896435>
- [16]. Lara Jaillon C. S. Poon "Sustainable construction aspects of using prefabrication in dense urban environment : A Hong Kong case study" - Journal / Publication Construction Management and Economics Volume 26, 2008, p. 953-966. <https://doi.org/10.1080/01446190802259043>
- [17]. VPS Nihar Nanyama, Anil Sawhneyb, Prateek Arun Guptaa (2017), "Evaluating Offsite Technologies for Affordable Housing" - Creative Construction Conference 2017, CCC 2017, p.19-22. doi: 10.1016/j.proeng.2017.07.183
- [18]. Stelladriana Volpe, Valentino Sangiorgio, Andrea Petrella, Armando Coppola, Michele Notarnicola and Francesco Fiorito, 'Building Envelope Prefabricated with 3D Printing Technology' - Sustainability 2021, 13(16), 8923. <https://doi.org/10.3390/su13168923> Indian Journal of Science and Technology
- [19]. Mudan Wang , Cynthia Changxin Wang * , Sisi Zlatanova , Samad Sepasgozar and Mitko Aleksandrov, "Onsite Quality Check for Installation of Prefabricated Wall Panels Using Laser Scanning" - Buildings 2021,11(9), 412. <https://doi.org/10.3390/buildings11090412>
- [20]. K G Tsikaloudaki, TG Theodosiou, CS Giarma, K J Kontoleon, A C Karaoulis, "Advancing sustainability in prefabricated buildings" - IOP Conf. Series: Earth and Environmental Science 588 052067 Volume 588, p.1.15–1.19. <https://iopscience.iop.org/article/10.1088/1755-1315/588/5/052067>
- [21]. Zhenmin Yuan, Guodong Ni, Linxiu Wang, Yaning Qiao, Chengshuang Sun, Na Xu and Wenshun Wang, "Research on the Barrier Analysis and Strength Measurement of a Prefabricated Building Design" - Sustainability 2020, 12(7), 2994. <https://doi.org/10.3390/su12072994>
- [22]. Kartik Yadav1 , Prof. (Dr.) Omprakash Netula , Faraz Khan "A Review On Prefabricated Multistory Structure" Journal of Huazhong University of Science and Technology 50(7), July 2021.https://www.researchgate.net/publication/353544851_A_Review_On_Prefabricated_Multistory_Structure
- [23]. X. Zhai, R. Reed, and A. Mills, "Factors impeding the offsite production of housing construction in China: an investigation of current practice," Construction Management and Economics, Volume 32, Issue 1-2, p. 40–52, 2013. <https://doi.org/10.1080/01446193.2013.787491>
- [24]. Q. Lv, "Economic evaluation system model of prefabricated energy-saving buildings," Journal of Shenyang Jianzhu University (Social Science Edition), vol. 13, no. 3, pp. 303–306, 2011, in Chinese. <http://dx.chinadot.cn/10.3969/j.issn.1673-1387.2011.03.012>
- [25]. W. H. Tsai, S. J. Lin, J. Y. Liu, W. R. Lin, and K. C. Lee, "Incorporating life cycle assessments into building project decision-making: an energy consumption and CO2 emission perspective," Energy, Volume 36, no. 5, p. 3022–3029, 2011. https://www.theric.org/research/tech/periodicals/doi.php?art_seq=917629
- [26]. UNDESJO, G.: Supply Chain Management and Logistics in Construction: Delivering Tomorrow's Built Environment, Kogan Page, 3 July 2015.
- [27]. Yuan, Z.; Sun, C.; Wang, Y. Design for Manufacture and Assembly-oriented parametric design of prefabricated buildings. Automation in Construction 2018, 88, p.13–22. <https://doi.org/10.1016/j.autcon.2017.12.021>
- [28]. Xizhen Gao, Jiantong Zheng, "Research on the Key Driving Factors of Prefabricated Buildings Based on DEMATEL method" - E3S Web of Conferences 165(3), 04050 (2020). <http://dx.doi.org/10.1051/e3sconf/202016504050>

- [29]. Oguzhan Yavuz Bayraktar, "Prefabricated Concrete and Waste Management" International Journal of Engineering Research & Technology (IJERT) Volume 9 Issue 12, December-2020. https://www.researchgate.net/publication/348339462_Prefabricated_Concrete_and_Waste_Management Indian Journal of Science and Technology
- [30]. Thamizhanban Nirmala Jothi, Deivavinodhan, "A Hypothesis on State of Offsite Production in India - OSP as Solution to Improve Productivity of Indian construction Industry". April 2015. <http://dx.doi.org/10.13140/RG.2.1.1158.8969>
- [31]. Hana Begić, "Prefabricated Building" – July 2018. <http://dx.doi.org/10.13140/RG.2.2.13378.61124>
- [32]. Guobin Wu, Shixiang Zhou, "Factors influencing the application of prefabricated construction in China: From perspectives of technology promotion and cleaner production" Journal of Cleaner Production Volume 219, 10. <https://doi.org/10.1016/j.jclepro.2019.02.110>
- [33]. Dajiang Wu, "Application of BIM technology in assembly building" Building Structures 49 (24) p.98-101. <http://dx.doi.org/10.1088/1755-1315/760/1/012005>
- [34]. Alan Verghese Ittyeipe* and Anu V, "Barriers to Adoption of Precast Concrete Construction in Buildings" Proceedings of International Web Conference in Civil Engineering for a Sustainable Planet, AIJR Proceedings April 11, 2021. <https://doi.org/10.21467/proceedings.112.2>