

Prefabrication in Developing Countries: a case study of India

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Introduction

The role of prefabrication in architecture has been lauded for its potential to increase productivity and efficiency while not sacrificing quality. The values of better, faster and cheaper are applicable to developed countries such as the U.S., Japan, and Europe, whose middle class continues to demand this equation in buildings that range from the remarkable to the prosaic. Developing countries, including China, India, Africa and many parts of South America, that are beginning to rely on prefabrication have the potential advantages of realizing housing quickly and affordably; however, greater reliance on manufactured production has possibly more disadvantages than advantages for these cultures.

With prefabrication, improved working conditions would seem to be agreeable to everyone: instead of building in the weather, international fabricators supply controlled environments with ergonomically considered equipment – and yet in many fabrication environments, reliance on minimal skills, and a disconnect with the community in which workers live, leaves little room for continued fostering of personal and collaborative skills, culture, tradition and community building. The potential for prefabrication to be used to create

a bland, monotonous landscape is an issue that developed countries' construction professionals must grapple with. Countries such as India are undoubtedly suffering a greater banality in the built environment by embracing prefabrication. Prefabrication is touted as offering a more sustainable solution to building, but developing countries already rely on vernacular practices for design and construction that require relatively low life cycle energy.

Developing countries continue to embrace technology from their developed country allies. This trend does not seem to see a slowing. The following paper will address this growing trend through the example of India, a country that is transforming quickly by adopting digital, material, and construction technologies from around the world and rapidly transforming its landscape. This paper will illustrate the advantages and disadvantages of prefabrication adoption in this culture and suggest ways in which developed countries' architects and local building professionals may take a leadership role in fostering both culture and technology.

Prefabrication in India

Prefabrication in India began with the emergence of the Hindustan Housing Factory. The company was developed by the first Prime Minister of India, Pandit Jawaharlal Nehru, as a solution to the housing crisis that resulted from the influx of refugees from West Pakistan in the 1950s. The Hindustan Housing Factory pioneered the production of pre-stressed concrete railway sleepers to replace dilapidated wooden sleepers on Indian Railways. The company changed its name shortly thereafter to reflect the diversity of its operations. It is now known as the Hindustan Prefab Limited or HPL. Located in Delhi, today the government-run company prefabricates primarily precast concrete for architectural and civil projects throughout greater India.

When HPL began it was intended to produce low-income housing solutions for the deficit in India. Precast wall panels and frame members such as beams and columns provided a much-needed set of tools to erect quick structures for mass housing. The most difficult technology transfer obstacle for the HPL has been the cost of machinery and materials for production. Since the government could not recoup the return on investment for the factory through housing production, prefabrication from HPL

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