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Changing built form and implications on urban resilience: loss of climate responsive and socially interactive spaces

Bhaswati Ray^{a,*}, Rajib Shaw^b

^a Sivanath Sastri College (University of Calcutta), 23/49 Gariahat Road, Kolkata 700040, India

^b Graduate School of Media and Governance, Keio University, Shonan Fujisawa Campus (SFC), Zip 252-0882, Japan

Abstract

A resilient city is a sustainable network of physical systems, constructed urban form, and human communities. Traditional or vernacular built form evolves to achieve higher human comfort by using locally available building materials and construction technology and is more responsive to the geographic conditions. In contrast to the highly bureaucratized building process in modern built form, vernacular architecture is more climate responsive. A typical traditional building of earth emits fewer greenhouse gases, consumes less energy, and maintains a high level of internal thermal comfort. Resilient urban systems must also have resilient communities. Traditional built form results in the creation of social spaces, promotes adherence to socio-cultural value systems and imbibes a feeling of social cohesion. Modern construction techniques, greater energy consumption and the loss of diversity of architectural forms would have significant implications on urban resilience. The paper aims to trace the changing built form in a small settlement of West Bengal and the resultant loss of climate responsive and socially interactive spaces. Based on primary data sources and field observations, the paper also looks into the implications of the loss of such spaces on urban resilience and assesses the perception of the locals who prefer modernization of built form.

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* Corresponding author. Tel.: +91 983022829; fax: +0-000-000-0000 .

E-mail address: haswati173@gmail.com

1.1 Introduction to changing built form and urban resilience

Resilience has emerged as an attractive perspective with respect to cities, often theorized as highly complex, adaptive systems [1]. Unprecedented urbanization has transformed the planet from 10 percent urban in 1990 to more than 50 percent urban in just two decades [2]. Although urban areas cover less than 3 percent of the Earth's surface, they are responsible for an estimated 71 percent of global energy-related carbon emissions [3]. As cities continue to grow and grapple with uncertainties and challenges like climate change, urban resilience has become an increasingly favoured concept [4]. A resilient city is a sustainable network of physical systems, comprising of the natural environment, the constructed urban form/ built form, and the human communities.

The spectrum of built form, constituting buildings and the human made spaces between buildings, ranges from vernacular or traditional at one end of the continuum to the organizational management of design at the other. Vernacular built form emerges from a slow evolution of form based on available technology, economy and social patterns of the very people whose hands shape the physical environment in which they dwell [5]. The production is often a natural fit between form and occupancy and is conceived as a preindustrial condition. Traditional or vernacular built form evolves to achieve higher human comfort by using locally available building materials and construction technology which are more responsive to their geographic conditions [6]. In contrast to the highly bureaucratized building process in modern built form, vernacular architecture is more climate responsive. A typical traditional building of earth emits fewer greenhouse gases, consumes less energy, and maintains a high level of internal thermal comfort, regardless of the solar radiation outside.

Traditional architecture also forms the backbone of the socio-cultural set up of a place [6]. It results in the creation of socially responsive spaces and the development of traditional customs that continue to sustain the socio-cultural value system and a feeling of social cohesion. It is often conceived as a continuing dialogue between generations. Environmental and cultural sustainability and resilience is thus inherent in vernacular built form. Adherence to traditional urban form, however, is interpreted as stagnation, incapable of meeting the needs of an increasingly heterogeneous population.

At the other end of the continuum of building production, opposite to the vernacular tradition, is a type that might be called 'organizational management of design' [5]. Here the production of built form involves not the occupants but a cast of bureaucrats, committees, and entrepreneurs, who 'place a product on the market' [5]. The marketplace drives the production of the built environment, in the complex context of private interests, public agencies, and regulations. The highly bureaucratized modern construction techniques with artificial air conditioning, greater energy consumption, loss of diversity of architectural forms and socially interactive spaces, would have significant implications on urban resilience. Climate induced higher temperatures would increase energy consumption even in low income countries under the impact of rising income and increased urbanization. Typically, 'organizational management' is associated with postindustrial economy, the rise of the service sector, mass production and specialization.

1.2 Objectives of the Study

- To evaluate the traditional or vernacular built form with respect to climate responsive and socially interactive spaces in a small settlement in West Bengal.
- To understand the implications of changing built form on urban resilience
- To review the perception of the local residents towards changing built form

2. The Study Area

The area under study is the 200 year old settlement of Malancha in C.D. Block Kharagpur II, at a distance of 140km from Kolkata, the capital city of West Bengal, India (Fig. 1). Located 5km from Kharagpur Railway Station and 12km from the district headquarter of Medinipur, the old settlement has been witnessing changes in urban built form while trying to adhere to traditions and the heritage resources. A smaller area was delineated for a micro level study to comprehend the changes in built form and the obvious implications on urban resilience.

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