

Analysis of Environmental Sustainability in Post- Earthquake Reconstruction : A Case of Barpak, Nepal

Authors : Sudikshya Bhandari, Jonathan K. London

Abstract : Barpak in northern Nepal represents a unique identity expressed through the local rituals, values, lifeways and the styles of vernacular architecture. The traditional residential buildings and construction practices adopted by the dominant ethnic groups: Ghailes and Gurungs, reflect environmental, social, cultural and economic concerns. However, most of these buildings did not survive the Gorkha earthquake in 2015 that made many residents skeptical about their strength to resist future disasters. This led Barpak residents to prefer modern housing designs primarily for the strength but additionally for convenience and access to earthquake relief funds. Post-earthquake reconstruction has transformed the cohesive community, developed over hundreds of years into a haphazard settlement with the imposition of externally-driven building models. Housing guidelines provided for the community reconstruction and earthquake resilience have been used as a singular template, similar to other communities on different geographical locations. The design and construction of these buildings do not take into account the local, historical, environmental, social, cultural and economic context of Barpak. In addition to the physical transformation of houses and the settlement, the consequences continue to develop challenges to sustainability. This paper identifies the major challenges for environmental sustainability with the construction of new houses in post-earthquake Barpak. Mixed methods such as interviews, focus groups, site observation, and documentation, and analysis of housing and neighborhood design have been used for data collection. The discernible changing situation of this settlement due to the new housing has included reduced climatic adaptation and thermal comfort, increased consumption of agricultural land and water, minimized use of local building materials, and an increase in energy demand. The research has identified that reconstruction housing practices happening in Barpak, while responding to crucial needs for disaster recovery and resilience, are also leading this community towards an unsustainable future. This study has also integrated environmental, social, cultural and economic parameters into an assessment framework that could be used to develop place-based design guidelines in the context of other post-earthquake reconstruction efforts. This framework seeks to minimize the unintended repercussions of unsustainable reconstruction interventions, support the vitality of vernacular architecture and traditional lifeways and respond to context-based needs in coordination with residents.

Keywords : earthquake, environment, reconstruction, sustainability

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