Adaptive Architecture- A Pathway to Resilient Communities

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SUMMARY
Resilience, for social-ecological systems, is related to (i) the magnitude of shock that the system can absorb and remain within a given state; (ii) the degree to which the system is capable of self-organization; and (iii) the degree to which the system can build capacity for learning and adaptation (Carle et al., 2002). Through the evidence base examples of various disaster resilient architectural interventions, I propose to study how adaptive architectural interventions can help the community gain a resilient pathway towards resilience.

Keywords: architecture, resilience, post-disaster, recovery and reconstruction

INTRODUCTION
Since 2009 Kosi floods till Nepal Earthquake in 2015, I have worked very closely with the communities during post disaster recovery and reconstruction as part of various organisations. What I have observed amongst the communities is their strength, ability and resilience. The communities have helped me to understand how architectural interventions should serve the safety of community and thus design to take shape within the community. Whether a community residing on flood prone banks of river Kosi in Bihar, or earthquake prone mountains of Sikkim or cyclone prone marshy lands of Sunderbans, communities have helped me to develop various architectural solutions for this regions, helping me to believe in the fact that they will be able to cope up the next disaster in a much better way.

This voyage has helped me translate various aspects of communities in preparing comprehensive compendium titled “PAHAL” showcasing house designs for various geo-climatic zones for PMAY-G Bihar. These architectural interventions do not alienate themselves; rather become part of the communities adapting themselves with the region and particular geography. This small scale intervention promises big impact to empower communities and develop a path-way towards a resilient future.

Through this brief experience I aim to showcase a number of adaptive architecture cases that are replicable and can be transformed into normal community and national practices. With the help of the examples of adaptive architectural solutions, the objective is to transform experiences of these communities into normal disaster-resistant constructive behaviour and, ultimately help to achieve the principle of leaving no one behind which has been given central importance in the SDGs. This evidence based research will result an understanding how various adaptive architectural solutions can help the communities mitigate disasters in order to develop a pathway towards resilience. I propose to conduct a study on three examples:

1. Flood Resilient Construction (Flood Plains of Rapti River Gorakhpur, Kosi River in Bihar and Marshy Lands of Sunderbans)
2. Earthquake Resilient Construction (Hilly Terrains of Sikkim)
3. Rural Housing Solutions in geo climatic zones for states of Bihar, India

EXAMPLES OF ARCHITECTURAL SOLUTIONS DESIGNED AND IMPLEMENTED IN RESPONSE TO VARIOUS DISASTERS

Figures
1. Flood Shelters constructed in remote locations of Bihar, Odisha and West Bengal with the support of Save the Children in response to 2008 Kosi Floods.

Figure 1. Flood Shelter in Bihar © Development Professionals’ Forum
2. Cost-Effective, Environment-friendly and Disaster-resilient Construction of Vocational Skill Training Centre in the Cyclone Aila affected Sandeshkhali Town, West Bengal 2009

![Figure 2. Forum Cyclone Shelter in Sunderbans © Development Professionals’ Forum](image2)

3. Pre-fabricated flood resilient school structure for community residing along the banks of Rapti River Gorakhpur, Uttar Pradesh, India 2013

![Figure 3. Flood Resilient School Shelter in Bihar © Sustainable Environment & Ecological Development Society SEEDS](image3)

4. Low cost flood resilient house in peri-urban ward of Gorakhpur, Uttar Pradesh, India (2013) Flood-resilient and affordable house prototype in Gorakhpur, India to help community to various climate change impacts. It was awarded as UNFCCC 2013 Light House Activity Award.

![Figure 4 Low cost flood resilient houses](image4)

5. School Reconstruction for Human Resource Development Department, Gangtok Sikkim 2011

![Figure 5. Society SEEDS School in Ikra and RCC construction (hybrid-ekra as an earthquake resilient model) © SEEDS](image5)


![Figure 6. “PAHAL” compendium an initiative by Ministry of Rural Development and United Nations Development Programs towards PMAY-G © SEEDS](image6)

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