

Project Brief

Project Title : RESILIENT DHAKA

Project Tagline : Embracing Resiliency through Active Community, Neighborhood Development, and Regenerative Living

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Urge of Urban Resilience

Disaster (disease, ecological and economical), urbanisation, and energy shortage are the challenge of cities in Bangladesh. With the shortage of fossil fuel in 2025 which will led to prices inflation, It will be the poorest countries and people who will be most vulnerable to this threat and who will suffer the earliest and the most as high housing costs push the lowest-income people into slums and areas that are prone to floods, landslides and other natural disasters (UN-HABITAT, Global Report on Human Settlements 2009). We are responsible to create resilient development while it still can be done, regenerative energy, and mutualism living with green environment, so that our cities will be resilient in the future, and livable in the present.

Issues : Dhaka , Bangladesh

Dhaka, Bangladesh's capital is the world's most densely populated and poorest countries (UNFPA 2011; World Bank 2012). Almost 30% of the city's population of more than 14 million lived in slum settlements (Islam et al 2005). Poor quality and densely built housing was typical in Dhaka's slum settlements and basic public infrastructure for water, energy, sanitation and hygiene were non-existent or very limited. It also means that Dhaka still have rooms for resilient development with the right system and approach (+40% developable areas).

Dhaka's key urban hazards included : widespread flooding and waterlogging (poor drainage); windstorms caused havoc in slum settlements because of the weak construction of houses;

unplanned urbanisation and sub-standard building practices posed great risk in the event of a major earthquake; urban fires were common; Bangladesh was one of the countries most threatened by climate change and impacts such as erratic weather, increased flooding and temperature rise were already evident.

Pilot Project : Karail (East)

Karail is the biggest single squatter settlement in Dhaka, with severe lack of sanitation, water, and hygiene, and toilet facility. Most of the buildings are self-built with no knowledge and standard of resilient structure. The greenery in Dhaka is all abandoned with a few trees that makes Karail so dusty and heavily polluted. The lack of knowledge for the gravity of riverbank areas made the unplanned urbanisation spread to the rivers with its wastes. This condition makes Karail ultimately prone to flood (even when monsoon season it floods), diseases (waterborne and airborne), and excavation by the authority. These are the main problems that needs to be fixed urgently :

Economic Problem

64.2% on employment rates, which means around 35.8% doesn't have income. The average incomes for the other 64.2% is only about US\$ 1.25 (mostly in services industry). Karail need alternative source of income, using the phenomenal microcredit and microeconomic practice

Health Problem

There are no medical services and institution available in Karail, especially in emergency, contrary to the number of diseases in Karail due to lack of sanitation and hygiene.

Housing Problem

Due to flood, money, and culture, semi-pukka house is the most suitable for slum improvement, with possibilities of self-improvement, but resilient to disasters.

Education Problem

Only 52% of children could go to school (age 3 - 14 y/o). The other 48% are not going to school, with no education from the community. Karail needs to build community green school that not only teaches formal education, but also the essence of green living for the better future of Karail and Dhaka.

Main Idea for Resilient Dhaka

A specific approach to enable urban resiliency in Dhaka is crucial. The aspects for the 'specific approach' are the high density and overpopulated city (many people, possibilities of strong community), flood-prone areas in most of the poorest area in Dhaka, low income households (\$1.25 / day), and shortage of infrastructure to manage water, waste, drainage, and sanitation in most areas in Dhaka. Due to these aspects, a new system of Resilient Dhaka is created with three scale of development. The implementation of these scales are centered in the community as user-decider-caretaker, with help by the professionals, NGOs, Developers, and Government. The scales are using each own timeframe which will make the project divided to series of development in Dhaka. The scales are :

Scale 1 : Active Community Participation

Community strength and resilience is the most important for building urban resilience. With lack of bond in the community, individuals will be vulnerable during ecological or economical disasters, and chronic stresses in cities. The timeframe is annual, with repetition each year to strengthen the community. The activities are :

- Briefing / Training Concepts + Tools
- Community Based Participatory Risk Assessment (CBPRA)
- Community Action Planning (CAP)
- Community Development Plan (Long-Term)
- Micro-Economic Practise for Community Funding
- Dissemination + Next Step for Sustainable Community

Scale 2 : Resilient Neighborhood Development

To create urban resilience for slums and future neighborhoods, zero energy living is not enough. The neighborhood must be self-sufficient, resilient to disasters, and be livable through good quality of the environment and built space. To achieve the maximum possibilities of creating a resilient neighborhood, Participatory Design with the community is done with help from architects and professionals. The community work together to design the desired atmosphere and form of the neighborhood, adapting to the

socioculture and community needs/wants. The architects and professionals, work together to design the system (close system), to create resiliency, enhance living quality, and regenerating ecosystem, inside intergrated system. The developments are :

- Participatory Design Development
- Stakeholder Engagement for Funding and Continuity
- Planting SEED (ecopuncture) for Water, Waste, Sanitation Hub

To solve the problem for lacking of sanitation, clean water, energy, and food, green SEED is implemented. Together, SEEDs will create an independent grid for the neighborhood, consisting of communal bathrooms, rainwater tower, biodiversity area, waste collector, water purification reverse osmosis, water tank, and electricity storage Smart Grid (storing energy from PVs and biogas station).

- Growing Modular Mid-Rise Shared Housing (Positive Energy)

Modular mid-rise (semi-pucca) housing is designed for highly flexible and diverse community (Karail Community). It is the most suitable solution for Dhaka, as a synthesis for the affordability, flexibility, and expandability for Dhaka's people, especially the poorest. It uses local materials (bamboo, mud), and constructed by the people for the people (with proper community education on scale 1). The roof is 10o south facing, to maximize sun heat for PV cells.

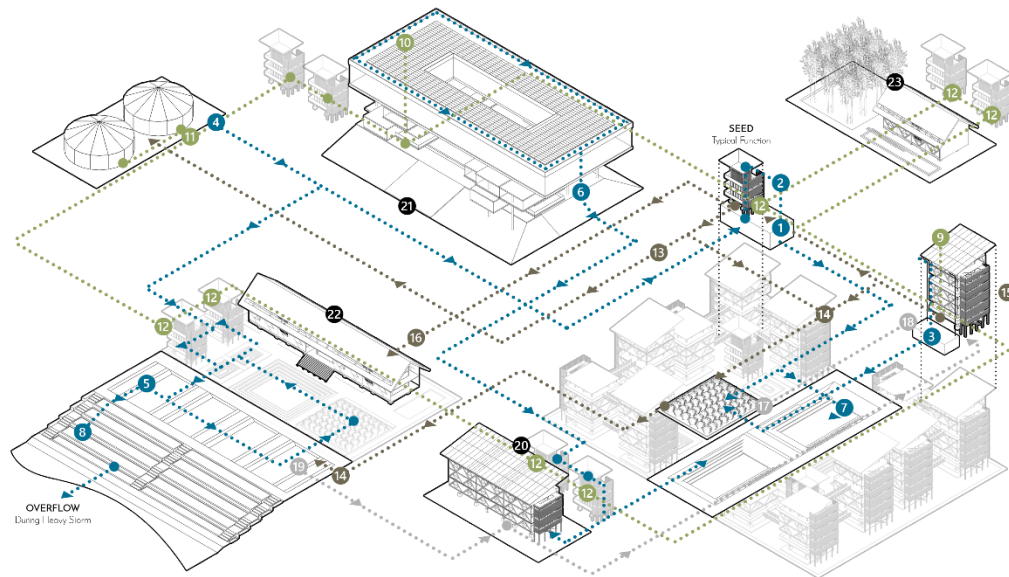
- Landscaping for Flood Prevention

Using wastewater management system, including bioretention areas, bioswale, sand filter, UV disinfection, riverbank filtration, and riverbank level wetlands

- Creating Productive Landscape (Agriculture + Aquaculture)
- Developing Community Infrastructure + Services

The infrastructure answers the needs to solve specific problems of an area, in this case Karail. Microeconomic spaces gives people alternative economic income. Medical Hub with MSF helps curing the disease within the neighborhood. Green school educates the children for the better future. Karail center provides more economic spaces, recreational area, and offices + institutes for NGOs and government.

- Managing + Maintaining Close-System



Regenerative Living

For existing structures and grids, zero energy living with livable environment is the minimum standard. Energy renovation must be done to create zero energy building, with green connectivity to create green and livable environment.

- Behavior Education + Training
- Energy Renovation for Existing Buildings
- Planting SEED (ecopuncture) as Green Hub
- Connecting Green Areas
- Regenerating Biodiversity and Ecosystem
- Creating Livable and Healthy Living Spaces

Final Goal : Resilient Dhaka

With the full implementation of active community participation, neighborhood + existing infrastructure development, and regenerative living with the ecosystem, Dhaka will be a desirable and lovable place to live, with resiliency in chronic stresses and acute shocks with minimum dependency on outsource energy. Net zero living through close system helps Dhaka to provide self – sufficient resource to increase resiliency.