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Calls to Action -- Climate-Related Disasters: Humanitarian Challenges and Reconstruction Opportunities

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Climate-Related Disasters: Humanitarian Challenges and Reconstruction Opportunities

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Humanitarian organizations, and the vulnerable communities they serve, are dealing today with the life-threatening consequences of poor design and planning. Climate change is not only taking place but also quite literally "taking places," imposing more frequent and intense events such as floods, hurricanes, droughts, and heat waves on built environments and people that are not prepared to deal with them. Staff and volunteers working in disaster management are at the forefront of the current climate crisis, but the complex relationships between place and climate require that humanitarian organizations rethink the way they will work in the future. They must forge new partnerships that address the root causes of the problem: not just by reducing the emissions that result in global warming, but also by reversing the social construction of vulnerability.

A changing climate means more work for humanitarian organizations, as the impacts of global climate change disproportionately affect poor people in developing countries (who have contributed least to greenhouse gas emissions). Rural livelihoods are collapsing, pushing more farmers into urban areas that are already unable to provide services to rapidly growing populations in sprawling periurban shantytowns. This migration in turn exacerbates inequities in health status and access to food, water, energy, and other resources. The higher frequency of disasters also means less time for recovery and an added loop on the downward spiral of poverty. Revising design goals and methodologies to mitigate the effects of climate change is an urgent challenge in both developed and developing countries.

This article is an invitation to architects and designers to collaborate with humanitarian organizations in promoting adaptation to climate change. From hazard-resistant residences and affordable flood shelters to disaster-resilient, inclusive urban planning policies, to public awareness campaigns or funding and design of reconstruction and relocation projects after catastrophic events, the humanitarian challenges brought by climate change can become a source of inspiration for those who shape urban places. The climate crisis may nurture development of sustainable design solutions that will help the most vulnerable sectors of the global population.

Impact of Climate Change on the Humanitarian Sector

The number of climate-related disasters is rising rapidly, as anticipated by climate scientists. On average, 250 million people a year are affected, more than 30 percent in just one decade. In Asia alone, some 66 million households suffered from the damage to or destruction of their homes by floods in 2007. Although governments and humanitarian agencies in these countries did respond, most affected households received little or no assistance. With the exception of some planned relocations and more resilient construction technologies, many of these households continue to live on vulnerable sites.

Particularly in urban areas, vulnerability is tied to a host of development patterns, from damaged natural systems to economic short-sightedness. Most obviously, coastal cities need to plan for sea level rise. If the cost of protective infrastructure is prohibitive, their residents need to learn to live with disasters, or relocate—a massive humanitarian endeavor. Despite recognition of risks, much more needs to be done to integrate climate change adaptation into planning and design.

The largely "invisible" populations of the urban poor need a place in planning solutions. The caseload of households that lack adequate shelter as a result of a rapid-onset disaster is often viewed as separate from the caseload of households that require shelter as a result of marginalization. Large portions of cities in the Global South are built by the poor by whatever means are available, often by squatting on hazard-prone land. As a result, too many people live in places that are unplanned and left "blank" on official maps, which makes humanitarian response more difficult. Poor communities need better infrastructure and services, as well as advocates in the urban design and planning process. Strategies that enable the poor to be designers of the places where they live are more effective than strategies that marginalize them because they do not have the resources to participate as consumers.

Similarly, residents of rural areas need to rethink their places in the light of changing climate risks. Humanitarian organizations are supporting the transformation of subsistence farming communities so that villagers can arrive at adaptation options based on both local knowledge and improved understanding of how climate change threatens their livelihoods. Numerous innovative ideas have emerged from participatory processes that allow people to understand the problem and conceive solutions.

Improvements in Disaster Response and Shelter

Disasters provide an entry point through which awareness of the need to reduce risks can be approached. They also may prompt the availability of resources and institutional support to address both the impact of the disaster and some of the underlying causes. For the International Federation of the Red Cross and Red Crescent (IFRC), providing shelter assistance after a disaster is an opportunity to ensure that shelter risks of affected households are reduced through informed programming and improved construction methods.

In the Philippines, the homes of four hundred thousand families were damaged or destroyed by Typhoon Durian in 2006. Although the national government had an established response mechanism, including the provision of basic building materials to affected households, this typhoon was the fourth such event of that particular season and public resources were depleted. While the IFRC with the Philippines Red Cross Society recognized that the affected households required immediate shelter assistance, they knew that these households would also be exposed to similar typhoons each year. The solution involved developing a household repair kit including roofing, framing materials, and fasteners for the targeted families, complemented by "construction theater" in the communities to promote basic safe and resilient building principles. Local Red Cross volunteers oversaw these activities, with the involvement of construction specialists from within the communities.

While fifteen thousand households received materials for construction of safer homes, entire communities were made aware of safe building principles. The introduction of coconut-timber structural frames, extended eaves, and thatched side-wall enclosures demonstrated improved construction technologies and employed the skills of local craftsmen. The use of familiar materials retained the sense of place and ensured a culturally appropriate response. When Typhoon Fengshen struck the Philippines, in June 2008, the Philippines Red Cross Society adopted the same safe building-assistance program, including the involvement of community volunteers who had experience with the previous safe shelter program.

The extensive flooding in Sudan, in 2007, displaced whole communities, and resulted in significant demands on locally

Opposite: Crossing a temporary bridge to an emergency shelter. Dhaka, Bangladesh, 2004 floods. Photo by Jesse Moore/CARE.

harvested timber and grass for reconstruction. Communities expressed concern that repeated seasonal floods would place excessive demands on households to rebuild, which would be exacerbated by the resulting shortage of materials, price increases, and environmental impact. The IFRC supported the Sudanese Red Crescent Society in advocating safer, more robust house construction, with raised floor levels and more resilient lower-level perimeter walling.

Many families had expressed concern that they would be forced to relocate to safer but distant parcels of land, disrupting established social and economic networks. To retain a sense of place while reducing flood risk, humanitarians held demonstrations of reconstruction of one or two houses per community. Household members and local construction artisans illustrated the benefits of intermediate frameworks to brace side-wall panels, improved fasteners, and secure anchoring to provide greater resistance to rising waters. Such a public process in a traditionally conservative society enabled the participation of female members of the affected households, who as a result were able to contribute to informed decision-making by the respective families.

In Gujarat, India, following the earthquake in 2001, the choice of appropriate materials for the reconstruction of rural housing was limited. The traditional use of stone was problematic, because of high cost and a building-code requirement for steel reinforcement. Fired clay bricks were in limited supply, and the high fuel demands on producing such a product was a concern. Concrete blocks offered a scalable local solution, but required extensive use of water, an issue in a semi-arid region threatened by climate change.

Local production of cement-stabilized compressed-earth blocks was encouraged by a number of nongovernmental national and international agencies as a way to provide local employment and minimize water requirements. It ensured that the greatest distance from any source of production was seven kilometers, a distance that minimized transport costs and ensured greater local ownership of the production process. The use of local materials also ensured that the finished houses were visually in keeping with existing masonry constructions, and the flexibility provided by masonry enabled new houses to be comfortably incorporated into existing settlement patterns. Although the new housing with reinforced compressed-earth block walls and tiled roofs could clearly be identified among the existing housing stock, it complemented the surviving structures. This program resulted in the development and ratification of official standards on earth technology, enabling more widespread adoption of an appropriate system for earthquake risk reduction measures that also supports climate change adaptation given increased water scarcity in the region.

The destruction in New Orleans and throughout the Gulf Coast wrought by hurricanes Katrina and Rita provide a profound illustration of the planning and design challenges that remain in the United States.

The damage affected some four hundred thousand homes, left three million people without electricity, and

Above: Transitional shelters capable of resisting typhoon-strength winds, built after typhoon Durian in the Philippines. Photo by International Federation.
Opposite: Flooding in New Orleans after Hurricane Katrina, 2005. Photo by Jocelyn Augustino/FEMA.

overnight submerged the region into a condition usually associated with catastrophic events in the Third World. The most expensive natural disaster in United States history, this event ninety thousand square miles (about the size of Great Britain) with recovery costs in the range of $75 billion to $100 billion.

Hurricane Katrina has also revealed the effects of inadequate maintenance of infrastructure (in this case the levee system) and deterioration of the protective coastal ecosystems. According to the pre-Katrina strategic plan (published in 1998) entitled "Coast 2050: Toward a Sustainable Coastal Louisiana," it was well known that New Orleans was at risk as lowland marsh and swampland along the Gulf of Mexico was deteriorating and being replaced by open water. Reversal of this trend is essential, as experts predict that the Gulf coast's wetlands are nearly impossible to recover.

Physical progress in the reconstruction of New Orleans and the Gulf coast region has been slow and piecemeal, highlighting the fact that developed nations as well as underdeveloped one need to refine disaster management processes. However, this event did stimulate an inspiring and unprecedented response from the planning and design community. Planning workshops were held by the U.S. Green Building Council and other organizations to seek solutions for rebuilding damaged communities in a way that would solve long-standing problems while respecting the rich history of the region. The "New Orleans Principles," developed to help guide the planning and rebuilding efforts, provide a solid template for environmental, economic, and equitable rebuilding solutions.

Promoting Collaboration between Sectors

Addressing reconstruction needs resulting from climate change requires concerted effort from humanitarian agencies, the commercial sector, and built-environment professionals from the public and private sector. Humanitarian agencies could benefit from more technical expertise to advance planning solutions and avoid liabilities in the design and construction sector. Likewise, the disciplines of planning, design and construction could benefit from engaging with humanitarian entities familiar with the demands of rapid, incremental decision-making that is often a necessity in disaster response. The manufacturing and construction sectors can also be valuable partners in advancing technical and programmatic solutions.

To enhance its effectiveness in coordinating housing and reconstruction agencies after disasters, the IFRC is supporting several collaborative initiatives. Examples include:

- Development and dissemination of risk-management tools and shelter-risk mapping.
- Partnerships with educational institutions (initially in the United Kingdom and the Netherlands) to develop design and construction curriculum focused on disaster response and risk reduction.
- Collaboration with technical institutes and the private engineering sector to develop appropriate technological and material solutions. (Current initiatives include construction materials in Peru, Indonesia, the Philippines, the Netherlands, and the U.K.).
- Providing reconstruction agencies with access to local craftsmen.
- Training of private-sector specialists in construction for disaster response and in risk reduction and disaster mitigation measures.

A number of roundtables have led to the creation of an embryonic shelter alliance whose firms are working with the humanitarian sector. In its turn humanitarian movement is seeking alliances with academia and the private sector to advance postdisaster reconstruction.

Where Designers and the Humanitarian Sector Overlap

The increased frequency and intensity of climate-related events call for new ways of conceiving the built environment and integrating information about rising risks into humanitarian tasks that includes disaster management, community risk reduction, health and care, water and sanitation, food security, and migration and conflict. Design

professionals can contribute to the work of humanitarian organizations showing them how to adapt to climate change. Strategies include the following.

Perform climate risk assessments. Planning agencies and humanitarian organizations should assess the potential impacts of climate change in rural communities and urban places, and planning follow-up. Examples include tropical cyclones, floods, droughts, fires, and heat waves. Evacuation routes and other risk management measures may need revision.

Engage land use planning and urban design processes. Cities need to plan services and infrastructure for all populations and find alternate uses for areas that are not appropriate for development. Systems such as wetlands and natural drainage corridors need to be protected so that their ecosystems can remain functional. Planning solutions including transit, utility networks, community resources (schools, primary-health-care centers and hospitals), and public open space reduce risk and enhance responsiveness when disasters do occur.

Invest in infrastructure. Cities are places that house families, businesses and community facilities on a network of shared infrastructure. Planners, designers, and professional and humanitarian organizations need to become a stronger voice for investment in infrastructure—both natural and built systems—as well as development of adaptation measures.

Improve building technology. New buildings demand bioclimatic designs, minimize water and energy consumption, employ alternative energy sources, incorporate efficient solid-waste recovery, utilize appropriate materials, and institute recycling and reuse of existing buildings where possible. Furthermore, homes, schools, and other public buildings can be designed to be habitable refuges during a crisis that disrupts energy, water, and/or sewer systems—a concept referred to as *passive survivability*.

Above: Designers raised awareness in downtown Buenos Aires: the installation of a submerged dwelling in the pond in the Planetarium park brought the stark reality of flooding to the heart of the city. Photo by Argentina Red Cross Society.

Establish and enhance partnerships. Addressing climate change cannot be done in isolation and requires partnerships among governments, civil society, the private sector, and knowledge centers. Design practitioners can contribute their facilitation and communication skills. They can also assist in formulation and management of public policies; and in coordinating the activity of diverse social stakeholders.

Support advocacy. Humanitarian organizations can work with design practitioners to help people and institutions learn about climate change and its humanitarian consequences, through both community-based activities and public awareness campaigns. Professional associations can influence governments and public opinion, helping to call on all relevant decision-makers.

Share experiences and information. We are only starting to address the rising risks, and there is much to learn. Humanitarian and design practitioners alike should document their experiences, in order to refine their own responses and to share good practices with others.

Complementarity

The vulnerabilities of households that are already marginalized is increasing increase because of climate change. This trend will result in excessive workload for government and humanitarian agencies, already overstretched in their capacity to respond to such disasters. Preserving the integrity of places and helping people adapt to different conditions will require the complementary skills of humanitarian and design practitioners.

The design professions must recognize that they have a role to play in reducing shelter and settlement risks as part of their responsibilities. Building standards, construction guidelines, land use planning, rights issues, and public policy will need to engage support from a broader range of stakeholders to meet the pressing humanitarian challenges that will result from climate change. Innovative thinking that builds upon practical experience from the field and promotes collaboration among professions will be essential in reducing vulnerabilities and creating safe and secure places.

Further Resources

Addressing climate change requires focused collaboration both within disciplines and across disciplinary boundaries. Organizations such as Architects w/o Borders, Engineers w/o Borders, and Architecture for Humanity help direct design efforts towards humanitarian issues, while platforms such as the Open Architecture Network and the UNFCCC database facilitate the exchange of ideas. These organizations promote critical discourse on humanitarian design, facilitate the exchange of ideas between design professionals, and provide opportunities for designers to work on-site, in partnership with developing communities. —*Ben Spencer*

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