Building Back Better

Practice Review and Knowledge-Building for Frontier Issues

Background and Input Paper

G20 Disaster Risk Reduction Working Group

July 2023

Objective

The aspiration to "Build Back Better" (BBB) in the aftermath of a disaster is moving from a mantra towards a realized promise. Since it first gained prominence in the wake of the 2004 Indian Ocean earthquake and tsunami, which engulfed a dozen nations with Indonesia, Sri Lanka, India, Maldives and Thailand sustaining the brunt of the damage, BBB has evolved both conceptually and operationally, finding rich meaning and varied applications in contexts from national to local. Still, the journey is ongoing while the imperative to reach beyond the status quo in the restoration of lives and infrastructure is ever-growing. The urgency is notably due to climate change, but is more generally augmented because of an increase in hazards of multiple origins (including geophysical, technological and epidemiological) and the concomittant expansion of exposure of countries and communities subject to structural, socio-economic and environmental vulnerabilities.

Disasters produce chaos and complexity, but also offer unique opportunities to recognize systems failures, reconfigure choices and channel resources to avoid or mitigate harm from future shocks — in short, to embrace risk-informed developmental approaches as a core element of disaster recovery. A nuanced understanding of the enablers of, levers for, and trade-offs around BBB will help decision-makers and planners seize those opportunities. To stimulate collective thought-leadership and action on disaster risk reduction and resilience, India, upon assuming the Presidency of the G20, established a new Disaster Risk Reduction Working Group (DRRWG) focusing on five priority areas: (1) Global coverage of Early Warning Systems for all hydro-meterological disasters, (2) Making infrastructure systems disaster and climate resilient, (3) national financial frameworks, (4) disaster response systems, including recovery, and (5) ecosystems-based appraoches. BBB falls most directly under the fourth priority, noting that some of the key barriers to the succesful incorporation of BBB practices in recovery strategies and programmes lie in the other domains, as do the potential solutions.

This paper, produced under the aegis of the International Recovery Platform, is intended to inform the proceedings of the third DRR WG meeting, which will take place in Chennai 24-26 July, 2023. Its key objectives are to reflect the breadth and depth of how BBB has come to be understood and made actionable during disaster recovery, and to crystalize and illustrate, drawing on specific case studies, both learnings and outstanding quandaries that warrant concerted attention going forward. The puzzle is large and complicated, the line between recovery writ large and BBB is not always easy to trace, and BBB approaches are variegated, as are the contexts in which they are applied. The ambition for this paper is not all-encompassing; rather, the document is meant to provide a common framework for dialogue and a basis for further knowledge exchange and collaborative problem-solving via the DRRWG platform on mainstreaming BBB in recovery efforts, with a focus on achievements, as well as gaps in planning and implementation, to advance and accelerate BBB practice.

The International Recovery Platform (IRP) is a global partnership working to strengthen knowledge, and share experiences and lessons on building back better in recovery, rehabilitation, and reconstruction. It is a joint initiative of United Nations organizations, international financial institutions, national and local governments, and non-governmental organizations engaged in disaster recovery, and seeking to transform disasters into opportunities for sustainable development.

CONTENTS

BBB: Conceptual Underpinnings and Transversal Themes

Scope, Scale, Sequence and Speed: Transformational Potential and Trade-Offs

Building Back Better (BBB) is enshrined in the Sendai Framework for Disaster Risk Reduction 2015-2030 as one of two tracks under Priority 4, alongside preparedness. The range of actions and stakeholders invoked reflect the paradigm shifts that have reshaped the conceptual foundations of the disaster risk management field over the past decades — from reactive to proactive, brick-and-mortar to human wellbeing and opportunity, and from top-down to participatory: "There has to be a broader and a more people-centered preventive approach to disaster risk," the Sendai Framework holds. "Disaster risk reduction practices need to be multi-hazard and multisectoral, inclusive and accessible in order to be efficient and effective."

Building Back Better
As defined by UNDRR and UNGA (2016):

The use of the recovery, rehabilitation and reconstruction phases after a disaster to increase the resilience of nations and communities through integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalization of livelihoods, economies and the environment.

Inherent in the BBB definition of UNDRR is the reorientation of development pathways during recovery, a task that is as essential as it is enormous. It is understood as a dynamic process that usually spans years and never reaches full completion in an evolving risk landscape. What is possible ex-post disaster is intrinsically contingent on what existed ex-ante, not only in terms of saving lives and meeting immediate needs during the event and relief phase, but equally for the opportunity space to mobilize knowledge, people and resources to imagine and implement interventions towards a "better" future. BBB is predicated on a willingness to change while preserving what is valued, and on the wherewithal to do so. This plays out at multiple scales, from national to municipal to individual, and in multiple sectors, from the macro-economy to livelihoods and service provision to cultural heritage, built and intangible.

These domains don't operate in isolation but interact in both predictable and unexpected ways, raising challenging substantive and process questions about expectation-setting, prioritization and sequencing in BBB. Some disasters trigger major sectoral overhauls, with far-reaching consequences for technology choices, economic and spatial structures, and governance. The reverberations last for years, evidencing that BBB is a catalytic component in a broader adaptive, developmental process that needs to manage multiple risks of different nature over time. Furthermore, translating even strongly articulated and well-funded BBB programmes into results can be challenging as they cascade through geographies institutions and sectors to the community and individual level. BBB is about seizing opportunities, but the willingness and readiness to do so varies across the multiplicity of actors. Not only skewed risk perceptions, inertia and resistance to redistributive measures can stand in the way, but also the psychosocial conditions that obtain in the wake of a disaster, as the cases below illustrate:

BBB AT MICRO-SCALE: LOOKING TO THE FUTURE AT A TIME OF BEREAVEMENT

INDIAN OCEAN EARTHQUAKE & TSUNAMI
ACEH 2004

The decimation of the west coast of the Indonesian province of Aceh, which saw 130,000 fatalities and a half a million more people displaced, spurred a reconstruction and recovery programme of historic proportions. Against a

HURRICANE SANDY
NEW YORK CITY 2012

Hurricane Sandy battered the East Coast of the United States in October 2012, inflicting an estimated $19 billion in damages and lost economic activities in New

backdrop of a peace process to end a 30-year secessionist conflict, the Aceh recovery framework traced interlinkages between the multiple streams that needed to converge for a successful transition, from democratic decentralization and the rule of law to economic development, the reconstruction of housing and infrastructure, the restoration of services, and gender and environment as cross-cutting concerns.

The agency that oversaw the $ 7.5 billion effort explicitly espoused BBB including its psychosocial and cultural dimensions, which it termed the "mental superstructure." As with all monumental tasks, the recovery saw successes and setbacks. An evaluation led by SIDA in 2008 included survey findings from Aceh that indicated improvements over pre-tsunami conditions in the overall quality of life and on specific metrics, such as village infrastructure and social cohesion, as well as the status of women (Brusset, 2009). It cited evidence to the effect that the housing programme promoted equity.

At the same time, it noted that trauma and fear still marred the lives of 67 percent of respondents and conceded that the targeting of the poorest proved inadequate. The latter point was affirmed by contemporary studies on chronic poverty and food insecurity, and later field-based assessments of community-led livelihoods programmes. Studying fishery and cattle projects in rural areas in 2013 with an express focus on durability of results 8 years after the disaster, a scholar of Indonesian agrarian life found sustainability hinged on local leadership and, importantly, the timing of the intervention. Perhaps paradoxically, some asset replacement and institution-building efforts came too early, coinciding as they did with an influx of aid that swamped the villagers' absorptive capacity, which was severely dampened by the ordeal they had endured. His conclusion stressed: "*…the importance of … delivering projects that matched the community's stage of psychological recovery. Villagers explained that for a long time after the tsunami, the majority of surviving villagers tended to be severely depressed. For many the initial* ***focus was just survival and emotional recovery, not planning, economic development and committing to the future****."*

Excerpt from *Using Community Led Development Approaches to Address Vulnerability after Disaster: Caught in a Sad Romance (McCarthy, 2014)*

York City (NYC) alone. Following the storm, NYC embarked on a massive resilience-building programme, including shoring up coastal defenses and revised flood-resistant building codes. Ten years later, a quarter of the large federal grants appropriated for recovery and resilience were yet to be spent, while development on the waterfront and in the 100-year floodplain had increased by 44% since Sandy (NYC Comptroller, 2022).

Despite accomplishments such as the elevation of thousands of homes, the overall process leaves NYC vulnerable and with lingering questions, including on the perpetuation of pronounced pre-existing inequities in access to housing and community amenities. Here too the experience was mixed, with some shining examples of low-income neighborhoods supported to chart their own path towards risk-reduction in line with their needs and others neglected or victims of "climate gentrification."

Scholars stress that barriers to inclusive, future-oriented planning were not always, and not necessarily, rooted in the dominance of technocratic approaches, but included very human limitations on what people facing disaster exigencies could handle:

"*Rebuilding in place without thinking about the broader implications of such decisions can be dangerous. That is especially true for economically vulnerable residents who are most harmed when disasters strike… At the same time,* ***planners were understandably hesitant to ask recently traumatized residents to further contemplate a frightening future of sea level rise and storm risk.***

Excerpt from *Hurricane Recovery Fails the Financially Vulnerable* (Finn & Pawlowski, 2022)

Several lessons and tensions cut across the examples above and the literature on BBB more broadly: Policies, market and other self-organizing forces interact; communities vary widely in their internal make-up and dynamics, and hence in their abilities to "bounce back," much less bounce forward; risk reduction in one area can produce important co-benefits, but also give rise to novel threats (for example, renewable energy development is land-intensive, creating siting challenges in many parts of the world); Stakeholders have different views and capacities to influence balanced outcomes; technologies and developmental processes are perpetually in flux, and both path dependencies and cutting-edge solutions shaping the universe of adaptive possibilities.

Organizing all these threads and orchestrating a well-guided BBB response is a matter of study and deliberation, but the time necessary is the scarcest of commodities. Building back faster is seen as decisive for impact mitigation (GFDRR, 2018), and the window for contemplating transformational change is a narrow one as policy and public support for alterations in the status quo compete with pressures to reestablish the familiar as quickly as possible. The recently completed Midterm Review of the Sendai Framework (UNGA, 20023) highlighted the resulting push and pull between imperatives to facilitate

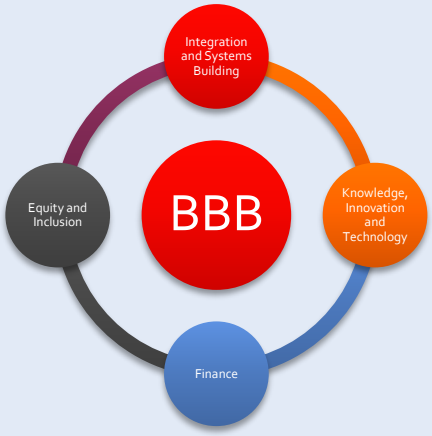
a recovery that is rapid and one that is robust (i.e. both comprehensive and consultative). "Prioritizing speed," the MTR noted, "significant opportunities are missed to build back better."

What might be concrete options for staking out a middle ground, in effect buying time while undertaking progressive improvements, is itself an underresearched topic, although new assessment tools are beginning to incorporate this foundational aspect of BBB (Neeraj, 2022). The housing sector is leading the way, with the journey from evacuation shelter to permanent dwelling often unfolding via transitional arrangements (Lyons and Schildermann, 2010). Studies of housing reconstruction programmes also show that the perceived trade-offs between speed and participation are not always as clear-cut as they seem; for example, in post-Tsunami Sri Lanka, contractor-built housing was slower than owner-built (ibid.)

There is broad consensus that, at the end of the day, only strong anticipatory action can help strike an appropriate balance between the pace of delivery and the quality of a recovery programme, preparing the ground for synergistic linkages with sustainable development. Without key building blocks in place before a disaster strikes, the *whats, wheres, whos, whens* and *hows* of BBB are almost certain to be drowned out in a cacophonic, helter-skelter crisis environment. The Sendai Midterm Review evinced a lack of sufficient progress on several dimensions that are important for the planning and implementation of Priority 4, including in governance, access to disaster data and risk-relevant information, and flexible and predictable financing. The redress of ingrained inequalities, a component of BBB credo since Bill Clinton's articulation of Ten BBB Propositions, including that "recovery must promote fairness and equity," (Clinton, W. 2006), also remains a central preoccupation.

The rest of the paper lays out a menu of critical issues at the frontier of BBB practice, in which further creation and consolidation of knowledge would be key for the implementation of recovery programmes that build back safer, smarter, fairer, and more cost-effectively. For ease of use, these issues are presented under four transversal themes (see graphic below). As a common point of reference, the paper also features below the BBB framework developed by Mannakkara, S. and Wilkinson, S. (2016), which is regularly used by scholars and practitioners to render the BBB concept more fine-grained and actionable (Neeraj, et.al. 2021), using an expansive interpretation that encompasses institutional, social and economic as well as structural and geospatial domains of action.

BBB Framework and Transversal Themes



Source: Mannakkara, S. and Wilkinson, S. (2016)

Building Back Holistically: Integration & Systems Building

Recovery Assessment and Planning as the Bedrock for BBB Programming

BBB is a guided process. Its bedrock is disaster impact and needs assessment, and comprehensive recovery planning (which can take place at the national, regional or local level, and in the case of a large-scale event involves all three). The choice of which of the myriad BBB strategies to pursue — in what combination, with what safeguards, in what order, and with what resources— requires both **baselines and a larger canvass containing a vision of the whole**. **A cross-sectoral view can help correct for imbalances**, including a persistent tendency to privilege phsyical reconstruction to the neglect of livelihoods, social and cultural issues, despite consistent evidence that integrated approaches that take account of the inter-dependencies between hard and "soft" infrastructure produce more durable outcomes.

The underlying analysis permits not only the **identification of key vulnerabilities but also their source**, and can thereby catalyze a search for suitable, innovative and inclusive remedies (is it the absence of resilient building codes, or their uneven enforcement that subjects the housing stock to flood or fire risk? If the latter, does the challenge lie in the lack of technical capacity of local authorities, the lack of risk awareness of residents, the unaffordability of compliance or, different still, the lack of accountability for governance failures?)

An overarching framework can further provide a **basis for prioritization and a rationale for sequencing interventions**. It anchors alignment efforts across geographic scales, jurisdictional boundaries, sectors and stakeholders; it can clarify entitlements and responsibilities, and uphold commitments when attention flags over the protracted course of a recovery (The Lancet, 2019). This is particularly salient for BBB given its focus on systemic change. In furtherance of this goal, a recovery plan can serve as a tool for **embedding linkages to longer-term development goals**. This both for high-level policy direction and in the reliance on — and strengthening of — existing developmental schemes or the introduction of new ones.

Good practice holds that recovery plans are dynamic, built not on single snapshots of damage and loss but rather evolving as "living documents" based on cumulative progress and learnings derived via monitoring of sectoral and area-based programmes. Learning and system building can also occur over successive disasters where these recur with high degree of frequency. **Whole-of-government and whole-of-society approaches are required**, coalescing forces through strong platforms to sustain communication and support partnerships, including at the grassroots level.

Establishing such networks and information managements systems, undergirded by institutional and financial arrangements, is best undertaken pre-disaster, and is itself an integral part of preparedness for BBB. Some countries, such as India and the United States, have specific guidelines to structure and expedite recovery efforts. In India's case (see text box to the right), these explicitly address the rationale and scope for BBB as well as the cost implications, as recommended by the Sendai MTR (UNGA, 2023).

Building Back Better

As incorporated into India's National Guidelines for Recovery and Reconstruction (DRAFT 2023):

Integrating the Build Back Better approach in recovery improves the economic vitality and safety of affected communities and provides opportunities to address vulnerabilities whilst increasing resilience in the long term. This integration can be achieved through advocacy, needs assessment, recovery planning and implementation, and improved accountability and transparency.

Ensuring resilient and robust outcomes of the recovery process requires improving standards and specifications of assets, facilities, and infrastructure. Equally important are investments in technologies, building practices, and social inclusion mechanisms for affected communities to benefit from recovery through improved living conditions.

There is always a debate if recovery and reconstruction follows a narrow approach, dealing with the effects and impacts of a disaster, or a broader approach seeking to address the development deficit in the region affected. There is no clear-cut answer; a relevant approach depends upon the context and the costs.

Case Study: Integrated Planning at National Level – Türkiye Earthquakes Recovery and Reconstruction Assessment (TERRA) 2023

In February 2023, a vast area in southern and southeastern Türkiye was laid to waste by a series of devastating earthquakes, claiming the lives of 50,000 people and displacing millions in a less affluent region hosting a substantial population of Syrian refugees. With support from the UN, the EU and the World Bank and applying the established PDNA methodology, the government undertook a preliminary needs assessment that estimated recovery and reconstruction costs at $103 billion, equivalent to 9 percent of the country's GDP (UNDP, 2023)

The TERRA **articulates a series of principles and priorities for reconstruction that together powerfully embody BBB, showcasing how improvements can be strategically and systematically woven into a future-oriented recovery programme** and providing a potential model for other countries for the concrete application of BBB as they endeavor to turn commitments into action.

TÜRKİYE RECOVERY VISION: PRIORITIES

Recovery and Reconstruction

Society	Economy	Infrastructure	Environment
• **Social assistance and** protection for vulnerable groups • Strengthen **public services** in earthquake zone and outside • Rebuild **health and education** services • Provide **psychosocial support** to all affected	• Shared vision for **regional economic revival** and growth • Attract, retain and upskill **workforce** to counter labor exodus • Restore and climate-proof **agriculture** • Modernize and **digitalize business**, and "**buy local**"	• Science-based spatial planning and regulation for **housing reconstruction** and urban revival • Rehabilitate and modernize **transport and communications** networks • Preserve and safeguard **cultural heritage** as core to local identity and tourism recovery	• Improving **disaster education** and management • Restore **energy provision** in line with net-zero vision • Safe **debris management** with resources recycled • **Nature-based solutions**, including ecosystem restoration

Five Principles to Guide Reconstruction Effort – TERRA (UNDP, 2023)

- **Build back better** for resilient structures, institutions and communities
- **Disaster risk reduction** in focus in education, policies and practices
- **Accountable** decisions made with the **participation** of those affected
- **Leave no one behind** in all relief, recovery and reconstruction efforts
- Employ **green, nature-friendly solutions** for a sustainable future

Case Study: Integrated Delivery for Improved Social Services – BBB in education following the 2015 Gorkha Earthquake in Nepal

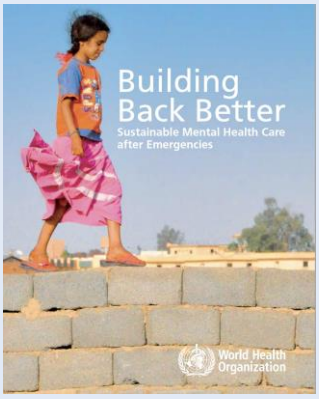
The earthquake that struck the north east of Nepal on the 25 April 2015 caused substantial loss of life and widespread destruction. Nearly 8000 schools were damaged or demolished, affecting the education of 1.5 million children (ADB, 2020). A School Earthquake Safety Programme (SESP) that had been instituted following the 1988 earthquake to retrofit schools did yield results, with improved educational facilities performing well structurally in 2015 and serving as shelter (Westoby et.al. 2021). But these results were partial, due to the limited coverage of the SESP, especially in rural areas, among other concerns.

A renewed effort to reduce disaster risk in reconstruction of schools not only expanded the geographic reach but sought to improve school functionality and accessibility, thereby enhancing enrolment and, ultimately, educational outcomes (ADB, unpublished). The undertaking was not without its challenges, from lack of road access in remote locations that required resorting to the transport of lightweight materials using porters and mules, to finding common ground among the communities, engineers, masons, lawyers, local officials, NGOs and others involved (Westoby et.al. 2021). All the more notable, therefore, are the achievements in **providing integrated solutions to strengthen seismic resistance as well as enhancing learning environments more broadly**. Under an ADB-supported programme, schools benefited from a host of improvements, including the provision of gender- and disability-

inclusive amenities, new science laboratories and information technology equipment, solar energy, and assistance in the preparation of community disaster risk management plans (ADB, 2020).

Case Study: A Bridge to Development — Mental Health Reform Building on Emergency Relief in Post-Tsunami Aceh and Sri Lanka

A 10-country study by WHO on **building better quality and sustainable mental health care systems during crisis response** identified good practices that highlight the importance of taking a developmental approach from the get-go (WHO, 2013). These include respecting the central roles of national governments and national professionals, revising national plans and policies with a view towards long-term sustainability, and reorganizing and training health workers. Case studies show that the evident, large-scale psycho-social trauma wrought by disasters can unlock political will and resources for an area often deprioritized in normal times.



Specific examples include (1) Sri Lanka, which scaled up mental health service infrastructure, including in areas that were not tsunami-affected, to 27 districts (compared to 10 pre-disaster), following a new policy based on community-based care, and (2) Aceh, which advanced from a sole mental hospital to a multi-facility decentralized approach with dedicated budget allocations to districts that received none before the tsunami. Aceh's became a template to follow by other provinces in Indonesia.

Case Study: Integrated Delivery for Resilient Resettled Communities

A particularly complex and delicate enterprise is the wholesale relocation of communities, considered by BBB advocates as only a measure of last resort (Neeraj, 2022). In Indonesia and Sri Lanka, post-tsunami directives to create coastal buffer zones cleared of habitations suffered from their singular focus on physical planning to the exclusion of livelihood, social and cultural considerations. Fishing communities whose income and identity was inextricably bound up with the sea ended up returning to their places of origin in violation of the restrictions and in defiance of narrow readings of human safety and security (Kennedy et.al, 2008).

The lesson has since reverberated through the literature, which features a litany of harms associated with misguided approaches (including social fragmentation, political marginalization and landlessness), and emphasizes **the imperative of holistic and participatory resettlement planning.** Comparative work examining outcomes in "model villages" set up in the Pakistani province of Punjab after catastrophic flooding in 2010 left 6 millions homeless had unequivocal findings: where health, education, and electricity services were provided, market-oriented skill development programs instituted, and houses designed to retain the local character with community input, the formerly extremely vulnerable populations raised their standards of living; where these were absent, they did not (Jamshed et.al. 2019).

Generally, however, case studies yield more nuanced and less binary results, as one would expect of large and complex resettlement programmes. For example, relocation schemes in the wake of the 2008 Wenchuan (PRC) earthquake included social welfare support and livelihood options for settlers (Chen et. al. 2017). Evidence exists of rural populations adapting well to their new, more urbanized environments, in terms of both reconstituted social networks and the continued pursuit of agriculture-based livelihoods (Wu, 2021). At the same time, the intentions of the Chinese government to accelerate the modernization of the Sichuan region appears to have met with mixed success, resting as it did on an incomplete analysis of the centerpieces of the strategy, such as tourism potential in mountainous areas and demand for large industrial spaces (Johnson and Olshansky, 2016).

Building Back Safer and Smarter: Knowledge, Innovation and Technology

Understanding Risk & Resilience to Build (Back) Better

Knowledge in many forms is a basic requirement for BBB. **Communities, government planners and private sector actors all need awareness and understanding of the hazards they face as well as actionable information about how to reduce their exposure and vulnerability.** Decisions to reinforce, resize, and resite structures — or to completely reimagine how their functions can be delivered (for example, using vessels that operate as solar powered floating schools, libraries and clinics, UNFCCC, undated) — must be **grounded in a granular appreciation of the spatial features of a target area and how the built and natural environment interconnect with human uses and values**. While the Sendai Midterm Review found improvements in disaster data accessibility and use, informational constraints on BBB are still common.

Knowledge Requirements for Building Back Better
As reflected in the Bangladesh National Plan for Disaster Management 2021-25 and the PDNA Floods 2022:

*Bangladesh is in the midst of rapid change spurred by urbanization and climate change, where **the nature of disaster risk is also changing.** There is thus the need to regularly update and re-formulate disaster management plans not only to adapt to the changing circumstances, but to also utilize the **opportunities offered by new technologies** and global linkages.*

*Given the dominant role of agriculture as a means of livelihood for families in the north-east, there is a considerable opportunity to support and expand efforts to implement **climate-smart agriculture practices**...these may include floating farming, weather-based insurance schemes to reduce farmer risk, increasing the use of renewable energy in agriculture, crop suitability zoning, localized weather forecasting, stress-tolerant rice varieties.*

*Indicative **examples of scientific data products** include area-based forecasting, flood zoning maps, geomorphological research to understand water-logging, model for sea surface monitoring and coastal tide monitoring and study of river morphology. Studies should also be undertaken on **socio-economic** and long-term impacts of disasters.*

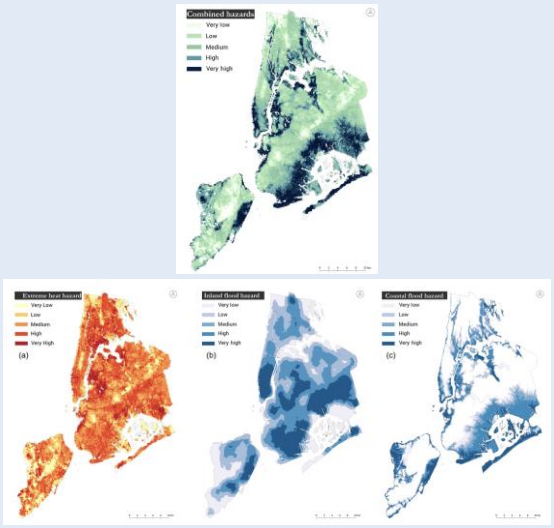
Case Study: Cambodia Irrigated Agriculture — Filling Knowledge Gaps for Building (Back) Better in the Future

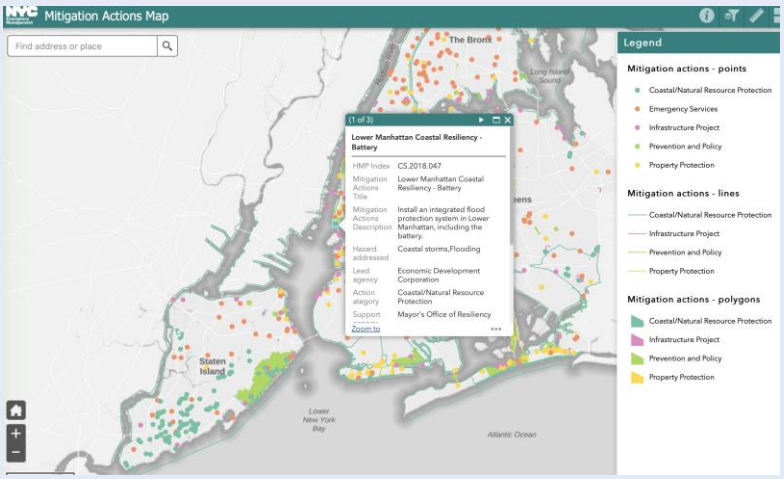
In 2011 and again in 2013, Cambodia experienced serious flash flooding that caused extensive damage to rural infrastructure. ADB supported a project to restore, to their original standards or better, assets critical to agricultural livelihoods. Structural weaknesses were found to have contributed to the damage of irrigation schemes, including inadequate drainage and erosion control. The project upgraded the engineering components, based on updated hydrological design criteria, complementing these activities with "softer" interventions, including capacity building for water user communities to improve operation and maintenance, and strengthening flood early warning systems. Extensions of the hydromet system provided better real-time measurements of rainfall and river flows going forward. Such data is critical for the future design and development of irrigation and road networks. Indeed, among the key lessons learned, ADB identified the lack of such data as a constraint on BBB execution, recommending the exclusion or deprioritization of "areas which are inundated deeply and often during the last ten years if there is no available hydrological data to undertake required design studies ...to mitigate the risk that newly rehabilitated works would be damaged by future floods." (ADB, unpublished)

Data-enabled decision support tools, particularly multi-hazard risk mapping, are gaining in sophistication and use in disaster risk management, powered by advances in information and communications technologies with enormous potential for scaling up resilience planning and regulatory standard-setting (Tonmoy, F.N. et.al. 2020). However, such systems depend on the degree of penetration of digital services and tools, which is unevenly distributed (and indeed brings its own risks for disaster response, Fekete and Rhyner, 2020). Evidence of the degree to which recovery programmes apply a multi-hazard lens is hard to come by, although it is fair to assume that the **analytical groundwork must be laid well in advance of a disaster** for this to be possible. A study of critical infrastructure upgrades on Saint Martin's Island after Hurricane Irma in 2017 found that a multi-hazard approach was adopted solely for the electric network reconstruction, and

not for transport, drinking and sewage or telecommunications systems, all of which are equally susceptible to flood, landslide and seismic risks (Sarkissian et.al. 2021). More common appear to be **platforms for following progress on recovery actions,** which does increase accountability. An example is offered below using New York City of multi-hazard risk maps (Dipietri, Y. et. al. 2018) and a municipal web-based tracker of disaster mitigation actions, including those initiated after Superstorm Sandy.

Case Study: Inscribing Building (Back) Better in Multi-Hazard Risk Profiles — NYC





Cultural heritage in particular is embodied in physical structures and sites (including monuments and homes built in traditional architectural styles) but also encompasses customs and modes of thought and expression that mold identities and create meaning. Knowledge draws from many sources and innovation can lie in the melding of modern technical advancements and the participation of citizens whose engagement is essential for protecting "the tangible and intangible values" of the cultural patrimony of which they are the custodians ((Government of Nepal, 2021).

In southern Italy, the 700 hundred year old hilltop cathedral that still serves as the symbol and fulcrum of the town of L'Aquila sustained a partial collapse and severe damage throughout the structure as a result of the 2009 earthquake; the church was rebuilt to permit the resumption of religious service as quickly as possible while a state-of-the art modelling and monitoring system was applied to support its reconstruction, bolstering each component — and the intricate complex in its totality — against future seismic activity (Antonacci et.al.2013).

Festivals, religious gatherings, and cultural artifacts are themselves conduits for recovery from disaster, strengthening the social fabric (Arora, V., 2020); Equally importantly, **cultural heritage also acts as a repository for knowledge on local conditions and resources,** including on building methods and materials, offering valuable lessons on sustainability, according the Framework for Culture in City Reconstruction and Recovery (CURE), developed by UNESCO and the World Bank (2017).

Case Study: Leveraging and Renewing a Deep Connection to the Land – BBB by the Tewa People (New Mexico, US)

The southwest of the United States has a long history of Native American occupation, extending back over 10,000 years. In 2011, Santa Clara Pueblo, home of the Tewa people on land they call Kha'p'o Owingeh, the Valley of Wild Roses, was overtaken by what then was the largest wildfire in New Mexico's history. The fire destroyed the majority of the tribe's forested land, denuding it and setting the stage for later floods to wash away roadways, blow out earthen dams, decimate wildlife habitat, and destroy cultural assets (Webber and Irvine, 2022). The Santa Clara Pueblo, who relied on the land for food, medicine, recreation and spiritual sanctuary, received federal assistance for recovery, becoming the first tribe to implement the National Disaster Recovery Framework (FEMA, undated).

Working closely with an array of agencies, the Tribal Council embarked on implementing **a strategy for forest as well as drought resilience. Boosting the natural functions of the ecosystem is the centerpiece of the approach, which incorporates knowledge on local resources handed down through generations**. Trees and crops are replanted using native species, rocks are used to slow water and create floodwater diversions, and ancient practices of controlled burns to remove underbrush in forests have been resumed. In the ponds that will result from dam restoration, the tribe plans to reintroduce a pure strain of native cutthroat trout. "This is a culture that has lived close to the land for centuries and whose elders tell stories that reach into a time beyond the imagination of industrial civilization," National Geographic magazine wrote in 2010, "There remains a faith among Native Americans that they can rediscover the ground where their ancestors know how to talk to the Gods." (Dykinga, 2010).

Yet this spiritual connection was physically severed by the disaster. Sacred areas within the canyon were closed for an expected 10 years due to safety hazards. This raised grave concerns about the possibilities for youth and children to partake in cultural activities and understand a way of life. Seeking another way, the tribal leadership ensured that Pueblo residents, especially its youngest, directly participate in the restoration projects (FEMA, undated).

Building Back Cost-Effectively: Finance

Accounting for BBB in Policies and Budgets: A Work in Progress

A decade ago, Lilianne Fan of the Overseas Development Institute (ODI) posed an unanswerable query: "Is it better to build one earthquake-proof home when for the same money we could build ten, 12 or 20 that meet people's immediate need for a roof over their heads, but could be death-traps when the next earthquake strikes?" (Fan. 2013). Finite resources impose constraints on disaster recovery, with budget envelopes often tighter than what would be required to meet assessed needs. The substantial matter of increasing the amount of capital available for recovery generally is beyond the purvey of this paper, and is covered in other resources such as the new IRP *Good Practices* overview (IRP, July 2023). The purpose here is to zero in more specifically on BBB-related issues, noting that, as the opening quote highlights, **BBB makes the inherent prioritization dilemmas starker**, especially against a backdrop of weakened public trust in institutions that often accompanies disasters (Podger Main, 2015). Two key issues will be discussed: one concerns the mainstreaming of methodologies to better capture the costs and benefits of BBB ((Macaskill and Guthrie, 2018), while the second addresses the structuring of incentives for earmarking financial flows to BBB solutions.

The question of affordability of BBB is paramount. As a starting point it is important to stress that **not every BBB strategy is costlier than the conventional alterative**, even in the immediate term. Green infrastructure and nature-based solutions in particular are widely touted as being cost-effective. Concrete numbers are offered as supporting evidence: for example, in Brazil researchers found that restoring 4000 hectares of native forest in São Paulo's watershed could reduce soil erosion and sediment management costs, yielding a 28 percent return on investment for the water company; similarly, in Portland,

Oregon, an analysis of options for improving water quality found that green infrastructure would be 51 to 76 percent cheaper than water-filtration plant upgrades (Cook and Taylor, 2020). The case becomes even stronger when considering the many ancillary economic and social benefits, from disaster risk reduction and carbon sequestration to improved health, livelihoods (e.g. mangrove restoration strengthens coastal disaster resilience and makes fisheries more productive) and employment (including the labor-intensive tasks of tree planting or floodplain restoration that can be incorporated into recovery programmes).

But even where up-front investments for BBB are higher, resilience pays off, although how much depends on assumptions about risk in a world of accelerating climate change in which history has become a poor predictor of the future. A study using a probabilistic cost-benefit analysis (CBA) of structural flood-proofing of low-income, high-risk homes in India (involving raised-plinth kutcha and pucca housing) showed a positive return on BBB investments, with climate change a significant determinant of the CBA results (Hochrainer-Stigler, 2019). The same logic holds at the macro-level: an IMF policy paper underlined that large and recurrent disasters dampen medium-term growth potential, including through higher effective cost of capital and out-migration, and affirms that investments in resilience produce net-savings for donors that provide significant support for post-disaster recovery. These benefits increase with disaster frequency and intensity (IMF, 2019).

To better assess the financial implications of BBB choices, **sophisticated tools are necessary that help quantify direct and multiplier effects, consider the costs of inaction, and address uncertainty** (Hoover Institution, 2019). Within the partnership framework for post-crisis recovery between the United Nations, the European Union and the World Bank, solid strides have been made in this direction. An example is the guidance on designing recovery programmes for the energy sector, developed by UNDP (UNDP, 2021), which sets out parameters for accounting for BBB improvements in PDNAs. These include: (i) improvements associated with risk reduction in technologies similar to those that existed pre-disaster; (ii) improvements in quality and access to services for the most vulnerable groups, including women-led households in rural areas and urban informal settlements; and (iii) improvements due to the replacement of traditional technologies with modern renewable technologies.

Budgeting for Building Back Better

Ministry of Planning, Development and Special Initiatives, Pakistan Floods 2022 Post Disaster Needs Assessment:

Needs are calculated in terms of replacement costs according to current prices and include a ***premium linked to building-back-better principles (such as improved energy efficiency, modernization efforts, and sustainability standards)***

The reconstruction and recovery needs include short (up to 12 months) and intermediate to long-term (up to five years) activities. ***While the needs estimate accounts for a build back better premium, it does not comprehensively include new and broader investments needed to strengthen Pakistan's adaptation to climate change and overall resilience to future climate shocks***.

Such approaches **crystallize concrete options and put a price tag on them**: the Guide cites calculations from Puerto Rico which vividly illustrates that BBB costs, when compared to baseline estimates, can vary substantially: upgrading the transmission and distribution infrastructure to withstand a Category 3 hurricane would increase costs by 3-40 percent, whereas for a Category 4 storm costs would rise by 24-70 percent.

Estimates of this sort can deeply inform decisions about how far to reach in BBB terms during recovery. Ultimately, however, **fiscal space, absorptive capacity and distributional considerations will be determinant**. **Policies to reorient funding mechanisms from replacement to improvements** are making inroads into recovery programmes — from the U.S. Congress's rare determination that between one-third and one half of the appropriations for recovery from Hurricane Sandy

be dedicated to smart rebuilding (Brookings, 2021) to the dispensation of housing reconstruction support in Nepal in tranches to facilitate (and verify) adherence to enhanced building code requirements. In the latter case, the delivery mechanism also built back better in a different way, i.e. by promoting financial literacy and inclusion of women, many of whom were first-time bank account holders (Government of Nepal, 2021). But institutionalizing such changes can be arduous for political economy and bureaucratic reasons (including such seemingly mundane issues as procurement rules favoring lowest bidder, a considerable stumbling block in the implementation of Nepal's cultural heritage restoration efforts [UNESCO, 2017]).

Most deeply, **worldviews shape a society's approaches to risk and cost sharing between the national and the local, and between the public and the private sector**. More pragmatically, **managing the trade-offs between resilient investment and debt accumulation while meeting current needs is at the heart of the financing for build-back-better challenge**. For this purpose, a host of innovative approaches are under development, including climate-resilient debt instruments to safeguard the fiscal sustainability of governments (IMF, 2019) and various bonds and insurance products tied to the implementation of resilience measures by private investors (Centre for Global Disaster Protection and UK Aid, 2018). How such mechanisms could be leveraged for BBB in disaster recovery processes would need to be further explored. On the side of households, especially vulnerable populations with low savings rates, social protection and subsidized loan schemes drawing on ongoing poverty reduction programmes can create financial breathing space. To what degree resources thus provided not only help maintain pre-disaster levels of welfare but also improve them would require further study (Nay et. al. 2019).

Case Study: Reducing Moral Hazard in Disaster Recovery in the United States

As the economic burden of disasters deepen, America's approach to rebuilding after disasters is coming under increasing scrutiny. In the United States, the regulatory regime imposes a considerable, and growing, share of the cost on taxpayers. The numbers are staggering: total federal payouts hover in the vicinity of $600 billion since 2005, much of it through the Federal Emergency Management Agency (FEMA) (Bagenstose, 2022). And that represents only a fraction of the total bill footed by the Federal Government, which is multiplied by a factor of five at least if social welfare and medical programmes are accounted for.

A similar drama is playing out at the state level: Over the past half decade, California has been ravaged by the most destructive fires in its history, precipitating the withdrawal of major insurers from the home insurance market (Blood, June 2023). Hurricane-prone southern states like Louisiana, Florida and Texas have also seen skyrocketing rates and limits in coverage (Frank, 2023). Observers argue that it is past time to shelve government programmes that promote risky siting decisions, among other perverse incentives, and redirect spending to advance resilience, including smart rebuilding. Facing some political headwinds, FEMA has begun to go down that road, buying out properties in hazardous areas, adjusting rates for flood insurance policy holders to reflect risk exposure, and proposing to condition access to federal relief funds to the adoption of resilience measures, such as hazard-resistant building codes.

Most policies have focused on "building back the same" and the public for the most part has been supportive. While that might have been tolerable in an era of modest impacts from natural disasters, that era is ending.

Frank. S. et. al. *Inviting Danger* (2021), Brookings

Case Study: Contrasting Experiences in Cost-Sharing – Wenchuan and Christchurch, New Zealand

The outpouring of financing support in the wake of the Wenchuan (People's Republic of China) earthquake was extraordinary. The PRC's government allocated a quarter of its 2009 stimulus package, prompted by the global economic crisis, to reconstruction. Individuals and NGOs inside and outside the country added substantial sums. Most unusually, disaster-affected counties were twinned with richer provinces which contributed from 1 to 3 percent of their respective annual gross domestic product towards long-term recovery efforts

over the course of three years or more (UNESCAP, 2015). As a result of such generosity, vulnerable rural households with substantial losses from the earthquake could be protected. Subsidies provided to them were so large that the poverty rate plummeted from 34 percent in 2007 to 19 percent in 2008 (Nay et.al. 2019).

The dynamic was substantially different in Christchurch, New Zealand, after its earthquakes in 2010 and 2011. Here the City Council found itself in prolonged negotiations over funding with both the central government — which, in line with national policies that did not contemplate "betterment," aimed to restore infrastructure assets to reasonable conditions without "unduly subsidizing" asset renewals that would benefit a specific region — and insurers, who objected to asset changes as a departure from coverage agreements (Macaskill and Guthrie, 2017). Existing policies hence constrained the opportunity for resilient recovery.

Building Back Fairer: Equity and Inclusion

Charting a Course & Concrete Actions to Leave no One Behind in Recovery

It is well established that **vulnerability is a key component of disaster risk**. Vulnerability is rooted in norms and practices that affect the level and distribution of human welfare, including the allocation of natural, physical and economic, as well as political and social capital (Wiesner, B. et al., 2013). When such allocations are severely skewed, disaster impacts disproportionately fall on those least prepared to withstand them. **BBB in this regard is akin to Leave no One Behind**, defined by the UN as "the central transformative promise" of the 2030 Agenda for Sustainable Development, with its focus on reducing inequalities and ending discrimination. **Building back more inclusively hence implies identifying and incorporating into disaster recovery programmes the needs and aspirations of a range of population groups who are marginalized** by virtue of characteristics such as economic status, origin of birth, ethnicity, religious and cultural background, gender, age, and disabilities. In different contexts and configurations, these categories overlap, requiring an understanding of the "intersecting layers of social exclusion" (UNDP Nepal, 2016), as well as an analysis of the variety of entry points for overcoming constraints and nurturing capabilities in enduring fashion.

Such **entry points exist in multiple domains — legal, cultural, and technological as well as economic, social and institutional — which must be tackled together to maximum effect**, cognizant of the root causes of vulnerability, the exacerbating effects of the disaster (for example in terms of gender-based violence, landlessness and disability) as well as of the long time horizons of transformational relational processes. **Agency and identity play key roles, pushing towards conceptions of BBB as opening meaningful participatory spaces for diverse forms of knowledge and practices as well as the targeting of resources in ways that promote equity.** The foundation is adequate information on different groups and their multidimensional vulnerabilities, an area in which the Sendai Midterm Review highlighted substantial deficits; **without the requisite data," problems remain invisible** and thus not solved within the policy framework." (UNGA, 2023). Establishing capacities for fit-for-purpose data collection and analysis, building on the recovery needs assessment, can therefore itself become a BBB intervention (Ferenz, 2021).

Meaningful engagement, via decentralization of decision-making and delegation of authority, is very challenging, especially with historically excluded populations (Action Aid Nepal, 2018). It can require operating in multiple languages, navigating micro-politics at community level in culturally appropriate ways and fielding the grievances that arise from shifts in power (Brusset 2009). The old adage that "progress moves at the speed of trust" is apt, and building that trust involves a consistent commitment to transcend stigma, take on board the input received, and provide adequate socio-technical assistance of the right kind in the right way (Government of Nepal, 2021). In short, doing "with" rather than for affected groups requires

adopting a collaborative model that blends different knowledge repertoires, combining cutting edge expertise and good practice with local lived reality to ensure local ownership.

Case Study: Changing Land Tenure and Inheritance Rights to Protect Women and Children in Aceh

A flagship initiative of the rebuilding effort in Aceh was the reform of land titling in resettlement areas, which endowed husband and wife with joint ownership. Conscious of the underlying forces that drive attitudinal and behavioral change, a wide-ranging socialization campaign accompanied the legal measures; these raised awareness with state and sharia courts as well as customary institutions on the importance of land and inheritance rights for women and children. For wider, popular uptake, educational videos were produced with these same (quasi)-judicial institutions and road-shows conducted in tsunami-affected villages (Fan, 2013). Analogous initiatives have been implemented in multiple Indian states (Odisha following the Super Cyclone, Gujarat after the earthquake, and Tamil Nadu post-tsunami, elevating the status of women in communities where men traditionally held exclusive property rights (UNDP, 2016).

Case Study: Community-Led, Participatory & Inclusive Recovery — Housing in Nepal and Diminished Deliberations in Christchurch

Owner-driven housing reconstruction (ODR) originated as an approach in South Asia more than two decades ago, and much expertise has accumulated in this time. Its main distinguishing factor is that communities are meaningfully involved in all major decisions, whether or not the end users physically construct the dwellings themselves. User satisfaction is generally high and the approach is often cheaper than the alternatives. In terms of quality, especially disaster resistance, the outcome depends on the resources and skills of the owners and the type of assistance provided (Lyons and Schildermann, 2010). Cautions are also raised regarding the exclusion of renters and those without land title, and that adaptations are required to meet the needs of the poorest with tailored financial mechanisms (Stephenson, 2020).

Nepal deployed ODR in its housing reconstruction programme, offering users choices among building type, size and construction materials within certain financial and design parameters to guard against seismic and flood damage. Cash assistance came with education and skills training and technical guidance. Particular attention was paid to identify and support the most vulnerable families. Top-off grants helped meet their financial needs and community groups were established to support single women, differently-abled people, senior citizens, and members of other marginalized groups access to recovery assistance. Among the key lessons learned identified by the Government of Nepal (Government of Nepal,2021) were the following:

- Make special provision to assure land titles to women, female-headed households and widows.
- Address the issue of indebtedness and options for providing access to low-cost credit.
- Ensure early establishment of a range of channels for two-way communication between beneficiaries, communities, local and central level authorities.
- Ensure communication and advocacy of resilient housing and appropriate earthquake-resistant technology options in collaboration with communities.
- Base housing designs, standards, specifications and technology options for reconstruction and retrofitting on context; an understanding and mapping of the cultural, social, environmental and topographical variations in housing design; and the requirements of householders.

On inclusivity, Christchurch began on the right foot: using an online platform, residents were invited to share their ideas for the redevelopment of the city after two earthquakes. There results were presented at a community expo which drew more than 100,000 visitors (UNESCO and World Bank, 2018). Feedback pointed to a strong desire for a compact, livable and green city. This was not to come to pass under an arrangement that granted the central government extraordinary powers to take charge of the rebuilding effort, an exceptional status lasting eight years. The complete closure of the central city for the first two spawned sprawl in outlying areas, increasing the development of greenfield sites and traffic congestion. A community organizer summarized it thus: "What we've done, very perversely, is we've gone and built a brand new last century city." (Matthewman and Byrd, 2020, citing Anake Goodall).

Case Study: Inclusion in the Rebuild Kerala Initiative

The south Indian state of Kerala experienced severe flooding in 2018, the worst nearly a century. The state is well known for its high levels of human and social capital, including a history of mass mobilization related to issues of land reform, caste discrimination and social justice, fostered by the "Kerala Model" of state investment in poverty reduction and social development (Kannan, 2023). This was fertile ground for creating a recovery programme centering inclusive practices. Below are some of the key elements included in the PDNA (Government of Kerala, 2018) and subsequent recovery programme to illustrate the range of entry points considered for vulnerability reduction and empowerment. Questions about equity in rehabilitation did surface as they are almost inevitably bound to (e.g. the World Bank in 2021 stressed the need to prevent the exclusion of women and other marginalized groups such as small farmers and tribal and landless households in social protection, health and agricultural interventions [World Bank India, 2021]) but the below is nonetheless an interesting composite of complementary actions:

Case Study: Haiti 2010 Earthquake — A Missed Opportunity for Building an Inclusive Agri-Food System

The post 2010 earthquake relief and reconstruction efforts in Haiti has been widely criticized as a departure from global principles of aid effectiveness, sidelining national institutions and recreating pockets of extreme vulnerability and, concomitantly, sites of high conflict and criminality, including the gang violence that emanated from the capital's slums and has engulfed the entire country. A key pillar of the recovery strategy was an agricultural development paradigm that privileged international food trade and investment in large-scale agro-industrial ventures. Productive resources such as land and water are very scarce in Haiti, occasioning

trade-offs within the agri-food system over the choice of crops, the type of farming, and the apportionment of value in the supply chain.

The approach adopted heavily bet on high-value cash crops for specialty markets abroad, such as the Francisque mango, while widely grown staples preferred by Haitian peasants and domestic consumers, such as cassava, sweet potato or plantain saw far less investment. This produced localized successes in increasing yields and income but has not achieved broader gains in livelihood and food security for the rural and urban poor. Analysts see as the root cause of this failure a tendency to gloss over barriers to the integration of small farmers into export-oriented production. Peasants have long staked their survival on informal, micro food production and exchange arrangements that prize redundancy and autonomy above all else. These militate against shifts in cropping patterns and labor relations that would be required to increase exports substantially. Understanding such long-standing coping strategies of the peasantry, developed to ensure survival in unforgiving conditions and tied to deeply-held social and ecological values, would have been critical to inclusively build back better in the Haitian agri-food system (FAO and WFP, 2023)

Case Study: Tailoring Support for Long-Term Recovery following the Great East Japan Earthquake and Tsunami

Following the 2011 Great East Japan Earthquake and Tsunami, Sendai City instituted an innovative programme designed to provide tailored support to households based on their specific recovery needs and their capacity to rebuild their homes and livelihoods on their own. Based on data from surveys conducted of disaster-affected individuals and households, this case management system was able to assess the specific needs of each household and provide the most appropriate support. The collaboration between different government agencies and private organizations enabled Sendai City to be flexible to offer more comprehensive support with daily needs, housing reconstruction, public housing, livelihood recovery, legal counseling, community healthcare and welfare services. The programme expanded its reach to connect with harder to reach residents and those who were temporarily housed outside of the city to ensure no one would be left behind. The programme is now linked with Japan's social security systems to help inform recovery needs with pre-disaster data. The Sendai City "disaster case management" model has now been more widely adopted in Japan. It has been used in recovery from the 2016 Kumamoto Earthquake and the 2018 Heavy Rain and Floods. This case study illustrates how local governments can take concrete steps to promote equity and inclusion in disaster recovery efforts, while considering pre-existing vulnerability and socio-economic status and needs (Hyogo Earthquake Memorial 21st Century Research Institute, 2021)

Literature Consulted

Action Aid Nepal, (2018), *Beyond "Build Back Better": Strengthening social inclusion and accountability through community-led reconstruction in post-earthquake Nepal*.

ADB (unpublished), *Social infrastructure: Case Study: Nepal Earthquake Emergency Assistance Program*, DRAFT for inclusion in ADB Build Back Better Guide, Chapter 7.

ADB (2020), *Five years after the Nepal earthquake — Building back better schools for a safer future*.

ADB (2015), *Linking post-disaster recovery to development*.

Antonacci, E. et.al. (2013), *La Basilicata di Santa Maria di Collemaggio: La storia, le attività, il terremoto del 2009, studi per la ricostruzione.*

Arora, V. (2020), *Five years on from the earthquake in Bhaktapur, Nepal, heritage-led recovery is uniting community*, Conversation Media Group.

Bagenstose, K. (5 November 2022), *A climate reckoning for US housing: Too many homes in harm's way; "too many zeros" in the costs,* USA Today.

Biswas, S. (2023), *A review of socio-economic vulnerability: The emergence of its theoretical concepts, models and methodologies*, Natural Hazard Research , doi: https:// doi.org/10.1016/j.nhres.2023.05.005.

Blood, M.R. (5 June, 2023), *California insurance market rattled by withdrawal of major companies*. Associated Press.

Brusset, E. et.al (2009), *A ripple in development? Long-term perspectives on the response to the Indian Ocean Tsunami 2004*, SIDA.

Center for Global Disaster Protection and UK Aid (2018), *Financial instruments for resilient infrastructure*, Technical Report

Chen, Y. et. al. (2017). *Post-disaster resettlement and livelihood vulnerability in rural China*. Disaster Prevention and Management: An International Journal, Vol.26 (1), pp. 65-78.

Clinton, W.J. (2006), *Key Propositions for building back better: A report by the UN Secretary General's Special Envoy for Tsunami Recovery*, United Nations.

Cook, J. and Taylor, R. (2020), *Nature is an economic winner for Covid-19 recovery*, World Resources Institute (WRI).

Dipietri, Y. et.al. (2020), *Multi-hazard risks in New York City*, Natural Hazards and Earth Systems Science, Vol.18, pp.3363-3381.

Dykinga J. (August 2010), *Native Lands*, National Geographic.

Fan. Lilianne, (November 2013), *Disaster as opportunity? Building back better in Aceh, Myanmar and Haiti*. Overseas Development Institute (ODI), Humanitarian Policy Group Working Paper.

FAO and WFP (2023*), Lien en Instabilité et Insécurité Alimentaire en Haïti: Une Analyse Pays*.

Ferenz, Michèle, 2021, *Accomplishments and Lessons Learned: Covid-19 Recovery Needs Assessment (CRNA),* Commissioned by UNDP with financial support from the European Union.

Fekete, A. and Rhyner, J. (2020), *Sustainable Digital Transformation of Disaster Risk—Integrating New Types of Digital Social Vulnerability and Interdependencies with Critical Infrastructure*, Sustainability, Vol. 12(22), Doi: https://doi.org/10.3390/su12229324

FEMA (undated), *A tribe's journey to prepare, mitigate and recover: Santa Clara Pueblo*, Case Study.

FEMA, (2011), *National disaster recovery framework: Strengthening disaster recovery for the nation*. U.S. Department of Homeland Security.

Finn, D. and Pawlowski, T. (2022), *Hurricane Recovery Fails the Financially Vulnerable,* Planning Magazine, American Planning Association.

Finn, D. et. al. (2023), *A region recovers: Planning for resilience after Superstorm Sandy*, Journal of Planning Education and Research, Vol.43 (1), pp.136-149. doi: https://doi.org/10.1177/0739456X19864145.

Frank, S. et.al. (2021), *Inviting danger: How federal disaster insurance and infrastructure policies are magnifying the harm of climate change*. Brookings.

Frank, T. (17 April, 2023), *Growing insurance crisis spreads to Texas.* E&E News by Politico.

GFDRR (2018), *Building back better: Achieving resilience through stronger, faster, and more inclusive post-disaster reconstruction.*

Government of Bangladesh (2023), *Post disaster needs assessment: Bangladesh floods 2022.*

Government of Bangladesh (2020), *National plan for disaster management (2021-2025)*, Ministry of Disaster Management and Relief.

Government of Kerala (2018), *Kerala post-disaster needs assessment: floods and landslides, August 2018*.
Government of India (2023), *National guidelines for recovery and reconstruction (DRAFT)*, National Disaster Management Agency (NDMA).

Government of Nepal (2021), *Nepal's recovery and reconstruction after the 2015 Gorkha earthquake: Lessons and way forward.* Summary Report: Part A. National Reconstruction Agency (NRA).

Hill Douglas, A. et.al. (2019), *Ready for tomorrow: Seven strategies for climate-resilient infrastructure.* Hoover Institution.

Hochrainer-Stigler, S. et.al. (2019), *Flood proofing low-income houses in India: An application of climate-sensitive probabilistic benefit-cost analysis,* Economics of Disaster and Climate Change, Vo.3, pp.23-38.

Hyogo Earthquake Memorial 21st Century Research Institute (March 2021), *Lessons learned & know-how gained from the Great East Japan Earthquake Case Studies*, FY 2020 Reconstruction Agency of Japan Commissioned Project, Hyogo Earthquake Memorial 21st Century Research Institute.

IMF (2019), *Building resilience in developing countries vulnerable to large-scale natural disasters*, IMF Policy Paper.

IRP (July 2023), *Good practices in financing recovery and building back better.* Consultative Edition.

IRP (2022), *Review of the Build Back Better component of Priority 4 in support of IRP's contribution to the Sendai Framework Midterm Review*.

Jamshed, A. et.al. (2019), *Building community resilience in post-disaster resettlement in Pakistan*, International Journal of Disaster Resilience in the Build Environment, Vol.10 (4), pp. 301-315, Doi: https://doi.org/10.1108/IJDRBE-06-2019-0039

Johnson, L.A. and Olshansky, R.B (2016), *After great disasters: How six countries managed community recovery.* Lincoln Institute of Land Policy.

Kannan, K.P. (2023), *Revisiting the Kerala "model" of development: A sixty year assessment of successes and failures*. The Indian Economic Journal, Vol. 71(1), Doi: https://doi.org/10.1177/00194662221145290

Kennedy, J. et.al. (2008), *The meaning of 'build back better': evidence from post-tsunami Aceh and Sri Lanka*, Journal of Contingencies and Crisis Management, Vol. 16: 1. pp 24–36, Doi: https://doi.org/10.1111/j.1468-5973.2008.00529.x

Lyons, M. and Schildermann, T. (Eds.) (2010), *Building back better: delivering people-centered housing reconstruction at scale*, Practical Action.

Macaskill, K. and Guthrie, P. (2018), *Funding mechanisms for disaster recovery: can we afford to build back better?* Procedia Engineering, Vol.212, pp. 452-458. Doi: https://doi.org/10.1016/j.proeng.2018.01.058

Mannakkara, S. and Wilkinson, S. (2016), *Selecting an institutional mechanism for building back better: lessons from Victorian bushfires recovery*, International Journal of Disaster Risk Reduction, Vol. 19, pp. 273-279.

Matthewmann, S. and Byrd, H. (2020), *A textbook case of how not to "build back better": Christchurch after the earthquakes*. Technical Report, World Urban Forum.

McCarthy, J.F. (2014), *Using community led development approaches to address vulnerability after disaster: Caught in a sad romance*, Global Environmental Change, Vol.27, pp.144-155.doi: https://doi.org/10.1016/j.gloenvcha.2014.05.004

Mishra, S.R., (February 2019), *Planetary health in Nepal's post-earthquake rebuilding agenda: progress and future directions*. The Lancet, Comment, Vol.3.

Nay, I. et.al. (2019), *Build back better: What is it, and what should it be?* ADB Economics Working Paper Series, No.600.

Neeraj, et.al.(2021), *Build back better concepts for resilient recovery: a case study of India's 2018 flood recovery,* International Journal of Disaster Resilience in the Build Environment, Vol.12 (3), pp.280-294.Doi: https://doi.org/10.1108/IJDRBE-05-2020-0044

Neeraj, S. (2022), *A Build back better assessment tool for post-disaster reconstruction and recovery*. PhD Thesis, University of Auckland, Australia.

New York City Comptroller, (October 2022), *Ten years after Sandy: Barriers to resilience*, Bureau of Policy and Research.

Podger Main ,O. (2015), *Reconstructing accountability after major disasters*, The Governance Brief, Issue 22, ADB.

Sarkissian, R.D. et.al. (2021), Evaluating the implementation of the "build-back-better" concept for critical infrastructure systems: Lessons from Saint Martin's Island following Hurricane Irma, Sustainability, Vol.13 (6), Doi: https://doi.org/10.3390/su13063133

Stephenson, M. (2020), *Lessons from the 2015 earthquake housing recovery*, Habitat for Humanity.

Suzuki, T. (2019), *Nuclear energy policy after the Fukushima nuclear accident: An analysis of "polarize debate" in Japan.* In Taner, T. (ed.), Energy Policy, intechopen.com.

Tonmoy, F.N. et.al. (2020), *Increasing coastal disaster resilience using smart city frameworks: Current state, challenges, and opportunities*. Frontiers in Water, Vol.2(3), Doi: https://doi.org/10.3389/frwa.2020.00003

UNDP (2023), *Recovery and reconstruction after the 2023 earthquakes in Türkiye: UNDP offer and proposed projects*.

UNDP (2021), *Disaster recovery framework guide for the energy sector*.

UNDP (2016), *Disaster recovery: Challenges and lessons*.

UNDP Nepal (2016), *Disaster, Disability, & Difference*.

UNESCAP (2015), *Regional earthquake recovery dialogue for building back better*.

UNESCO and World Bank (2018), *Culture in city reconstruction and recovery*.

UNESCO (2017), *Protecting cultural heritage: Lessons from the Gorkha earthquake.*

United Nations General Assembly, UNGA (2023), *Main findings and recommendations of the midterm review of the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2013*, A/77/640.

UNFCCC (undated), *Solar powered floating schools — Bangladesh*.

United Nations General Assembly, UNGA (2016), *Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction,* A/71/644.

United Nations, *Sendai Framework for Disaster Risk Reduction 2015-2030*.

UN World Conference on Disaster Risk Reduction (2015), *Reconstructing after disasters: Build back better*, Issue Brief, Ministerial Roundtable.

Webber, T. and Irvine, M. (1 November 2022), *Tribe seeks to adapt as climate change alters ancestral homes*, Associated Press.

Westoby, L. et.al. (2021), The road to recovery: Understanding the challenges affecting school reconstruction in rural Nepal following the 2015 Gorkha earthquake, International Journal of Disaster Risk Reduction, Vol. 56. Doi: https://doi.org/10.1016/j.ijdrr.2021.102120

Wiesner, B., et.al., (2013*)*, *Framing Disaster: Theories and Stories Seeking to Understand Hazards, Vulnerability and Risk.*

World Bank India (2021), *Resilient Kerala, Program for Results: Environmental and Social Assessment*, Part A: Final ESSA Summary Report.

World Health Organization (2013), *Building back better: Sustainable mental health care after emergencies*.

Wu, H. (2021), *When Housing and Communities Were Delivered: A Case Study of Post-Wenchuan Earthquake Rural Reconstruction and Recovery*, Sustainability, Vol. 3 (14), Doi: https://doi.org/10.3390/su13147629