

THEMATIC SESSION

BBB in infrastructure: making it stronger and accessible to everyone

May 13th, 2019, 11:00 – 11:30 hrs

Discussion paper

- i. Introduction
- ii. Background / Concepts
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Introduction

In the last decades, disasters left millions of people homeless with an economic loss of trillions of USD. Only in 2018 the Munich Re NatCatSERVICE registered 850 events. Geophysical events such as earthquakes, tsunamis and volcanic eruptions accounted for 5% of the total. Storms made up 42%, floods, flash floods and landslides 46%, while 7% fell into the categories of heat, cold and wildfire. The overall economic impact was US\$ 160bn. A comparison with the last 30 years shows that 2018 was above the inflation-adjusted overall loss average of US\$ 140bn.

The trend in economic losses is predicated to rise as more and more people choose to move to cities living in shoddily constructed houses and civic amenities that do not serve the growing population. As disasters strike countries, repeatedly, it destroys houses, disrupts basic services and causes loss of livelihoods. Millions of dollars are spent in recovery and reconstruction. This draws attention to the quality of recovery and reconstruction undertaken as well the systems and processes set up to ensure that it recovery process does not recreate risks rather builds back better. The inclusion of recovery as priority 4 of the Sendai Framework for Disaster Risk Reduction (2015-30) is a clear recognition of the importance of recovery as an opportunity to Build Back Better through safer infrastructure, resilient livelihoods, stronger governance systems, better early warning and improved preparedness of the Governments and communities to manage disaster risks.

Hazards impact rich and poor countries differently because of differences in vulnerability, which is the probability and exposure of a population to risks. These differ dramatically between rich and poor populations. The world's poor have fewer choices as to where they can live, fewer protections, and less backstops when shock events such as flooding, and earthquakes occur. In poor countries, the trend of rapid urbanization occurs in particularly hazardous areas; areas that would otherwise be undesired for development. Non-existent infrastructure and building codes plague these communities, leaving them vulnerable to a variety of natural events. When shock events like floods and cyclones occur, there are fewer backstops available such as insurance, cash pay-outs, and cheap loans for post-disaster relief. Additionally, due to the concentration of urbanization, a larger number of people are likely to be affected, and poor infrastructure makes it hard to effectively distribute relief supplies. Finally, urbanization has weakened traditional networks and community-based hedges, leaving those affected more dependent on external sources for aid. On the other hand, disaster situations in rich countries cost more money, but result in fewer deaths. To begin with, rich countries have more infrastructures and that infrastructure is more expensive to rebuild. Additionally, disaster situations affect the workforce and production, causing net economic damage beyond the rebuilding required.

Infrastructure play an important role in supporting industries and communities and also responding against natural disasters to reduce their impacts (i.e., routes and bridges for evacuation and public buildings for sheltering). Due to global warming, there is an increase in the frequency of extreme weather events, which pose a high risk of functional and structural failure of critical infrastructure. Natural disasters, such as the regular Midwest floods and Hurricane Ike in the United States caused severe damage to the infrastructure as well as the associated industries and communities that were relying on the infrastructure. The estimated damages due to Hurricane Ike were a staggering \$27 billion, one of the worst in U.S. history. A common observation in the analyses of these natural disaster events is the inadequacy of critical infrastructure to withstand the forces of natural calamities and the lack of mitigation strategies when they occur on the part of emergency-related organizations, industries, and communities. If the emergency-related agencies thus could identify and fortify the vulnerable critical infrastructure ahead of time, the damage and impacts can be significantly reduced.

Lessons from large scale recovery programmes shows that recovery would be implemented more successfully, and overall preparedness could be significantly strengthened if BBB principles already included as a part of the Disaster Risk Reduction systems in the country or set up soon after the disaster to lead recovery processes. However, at present the general level of preparedness and capacities for BBB application remains rather limited in most countries. Governments generally set up institutions and overall policies for recovery in response to a large disaster event and use existing institutions to respond to smaller events fully ignoring BBB principles.

Background

Building back better means that the repaired or replaced assets are more resilient, but also that the recovery process is shorter and more efficient, and that the entire recovery process does not leave anyone behind—i.e. that even the poorest and most vulnerable receive the support they need to fully recover. According to WB study the potential benefits of building back better, building on the framework and model, and considering the three dimensions, independently and together:

- **Building back stronger** reduces well-being losses by ensuring that reconstructed infrastructure can resist more intense events in the future. If all countries were to “build back stronger” in the next 20 years—ensuring that rebuilt assets can resist hazards with a 50-year return-period—then global well-being losses due to natural disasters would be reduced by 12 percent, a gain equivalent to US\$65 billion annually. Stronger reconstruction would reduce overall well-being losses due to natural disasters by more than 40 percent in ten countries in particular: Antigua and Barbuda, Dominica, Vanuatu, Myanmar, Laos, Tonga, Guatemala, Trinidad and Tobago, Peru, and Fiji.
- **Building back faster** reduces disaster impacts by accelerating reconstruction through measures such as contingent reconstruction plans, pre-approved contracts, and financial arrangements. Estimates in this report show that if the average reconstruction speed is reduced by two thirds (without compromising the quality of reconstruction), global well-being losses could be reduced by 14 percent—equivalent to increasing global consumption by over US\$75 billion per year. These gains are especially pronounced in countries with frequent events, such as small island countries or Sub-Saharan countries.
- **Building back more inclusively** ensures that post-disaster support reaches all affected population groups. This emphasizes the importance of providing reconstruction support to low-income households, which are typically more exposed, more vulnerable, and less comprehensively supported. If all countries had the ability to provide the poorest people with

the post-disaster support found in developed countries, global well-being losses due to natural disasters could be reduced by 9 percent, equivalent to a US\$52 billion increase in annual global consumption. The effect is particularly pronounced in countries with high inequality, and where poor people have little access to social protection and financial instruments. In Angola, Benin, Comoros, the Republic of the Congo, the Central African Republic, the Democratic Republic of the Congo, Russia, Gabon, Haiti, and Lesotho, building back more inclusively could reduce disaster losses by 27 percent or more.

The concept of building back better is aimed at improving the three phases of this recovery process, to ensure that the recovery contributes to a more resilient society. It is defined by the United Nations Office for Disaster Risk Reduction (UNISDR) as “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.” The recovery and reconstruction phase after a disaster offers incomparable opportunities to rebuild in a way that prevents the same hazards from leading to the same impacts, through the improvement of land-use planning (e.g., deciding not to reconstruct in a highly-vulnerable area), the application of construction norms (e.g., ensuring that rebuilt buildings can resist the next earthquake better), or the deployment of prevention and preparedness options (e.g., designing a neighbourhood to facilitate evacuation) (UNISDR, 2017). These opportunities are present mainly in the last phase of the recovery, when assets and infrastructure are repaired or rebuilt. But a better recovery can do more than reduce the impact of future disasters.

Typically, **infrastructure** may be regrouped in six main categories:

- **The Transport Sector** includes the following set of activities to move both persons and cargo: Road transport; Railroad transport; Pipeline transport; Air transport; Transport support, including airports, ports, tunnels, bridges; Postal services. The Transport Sector may sustain destruction of its physical assets – infrastructure and vehicles – (damage) and changes in its production flows, which may include both decline in production and higher production costs.
- **Protective Infrastructures.** These are various structures built for disaster protection purposes. They include drainage structures, pipe culverts, box culverts, footbridges, retaining walls, protection of slopes, jetties, small embankments or protection walls, and dams.
- **Socio Economic Structures.** These are various structures, developed for socio-cultural and economic prosperity. They include marketplaces and infrastructure within market grounds, including pathways, sheds, drains, community shops, community resource centers, religious centers, graveyards, playgrounds and so on.
- **Water and Sanitation.** These are the structures built for a water supply and sanitation. They may include: water reservoirs and water sources, supply pipes, ponds, the local water supply system, pump houses and deep tube wells, drainage lines, waste disposal and composting plants, etc. In a disaster, removal and treatment of human waste acquire increased relevance in avoiding the transmission of infectious diseases, and it constitutes a public health priority. Water, sanitation and hygiene (WASH) Programme can help reduce poverty and inequality if access and coverage are sufficient.
- **Energy.** These belong to energy sources and distribution lines.

- **Communication.** Information and Communications Sector covers the following activities: Publishing; Motion picture, video and television program production, sound recording and music publishing; Programming and broadcasting; Telecommunications; Computer programming, consultancy and related activities; and Information services. Telecommunications sub-sector is of special relevance to many developing countries that are affected by disasters of any kind, as the ability to communicate is of paramount importance during emergencies and in subsequent post-disaster stages. This sub-sector involves transmitting voice, data, text, sound and video, and the facilities may be based on either single or combined technologies.

In order to understand the scale of possible interventions we should review the **global expenditure on infrastructure**. The simultaneous crumbling of aging infrastructure in advanced economies and surge of development in developing economies will drive a steady four percent annual growth on infrastructure investment well into the second half of this decade, pushing total investment to a figure of four trillion dollars; according to global business consultancy Bain & Company. Core infrastructure sectors like electric utilities, oil & gas, and transport, which will grow at an average three percent per year through 2017, and Social infrastructure such as water, healthcare, and education which will grow at an annual average of four percent over the same period. According to the World Economic Forum, global spending on basic infrastructure—transport, power, water and communications—currently amounts to \$2.7 trillion a year when it ought to be \$3.7 trillion. This is in line with the \$4 trillion dollars suggested by Bain & Company that will be invested. The long-run global average spend on infrastructure is 3.8% of GDP. The McKinsey Global Institute estimates the average total value of big economies infrastructure at 71% of GDP.

Whether the economic toll of hazard impacts is rising faster than global GDP is unclear, since a wealthier world naturally has more wealth at risk. Still, the incidence of spectacular, multi-billion-dollar catastrophes seems certain to rise. A 2007 study led by the OECD reckoned that by 2070, seven of the ten greatest urban concentrations of economic assets (buildings, infrastructure and the like) that are exposed to coastal flooding will be in the developing world; none was in the 2005 study. In that time, assets exposed to hazards such as flooding will rise from 5% of world GDP to 9%. A World Bank study led by Apurva Sanghi estimated that between 2000 and 2050 the of the city population exposed to tropical cyclones or earthquakes will more than double, rising from 11% to 16% of the world's population. Development by its nature also aggravates risks. As cities encroach on coasts, wetlands and rivers, natural barriers such as mangrove swamps and sand dunes are obliterated and artificial ones—dykes and sea walls—are erected to keep the water out. The result is to put more people and property in harm's way if those barriers fail. As cities on river deltas extract groundwater for industry, drinking and sanitation, the ground subsides, putting it further below sea level and thus requiring even higher dykes. Since 1980 Jakarta's population has more than doubled, to 24m, and should reach 35m by 2020. Land that once absorbed overflow from the city's 13 rivers has been developed, and is now subsiding; 40% of the city is now below sea level. Making cities more resilient involves starker trade-offs in the developing world. On the one hand, urbanisation strips cities of their natural defences against threats and exposes more people to loss of life and property when an earthquake or cyclone hits. On the other hand, urbanisation makes poor people richer. The density and infrastructure of cities makes people more productive and more able to afford the measures needed to keep them safe. So mitigation measures should not discourage people from crowding into vulnerable cities but rather establish incentives for cities and their inhabitants to protect themselves better. Many cities have tough building codes but fail to enforce them. The World Bank study argues that giving more urban

dweller's title to their property would encourage investment in their safety, and lifting rent controls would encourage landlords to comply with building codes, since they could then recoup the cost.

Principles of 'building back better' that should be considered:

- **Do no harm: learn from the past and avoid unnecessary damage to future recovery**
Emergency relief activities can, inadvertently, hinder future reconstruction and recovery prospects. Governments and humanitarian agencies should start thinking as early as possible about recovery needs and the impact of relief programmes. Build on the best of local practices and avoid repeating past mistakes by learning from what existed before, and what survives the disaster.
- **Agencies must be accountable to the people they seek to assist**
People who have suffered in disasters are not helpless victims waiting to be rescued. They have skills and capacities; and should be allowed to determine how they want to rebuild their lives and livelihoods. They know their needs and what is acceptable. People themselves should be the drivers of reconstruction and recovery.
- **People affected by disaster should be the decision-makers**
All groups, including the landless, tenants, poorest, women and children need to be included in decision making. To facilitate inclusion and participation, it is necessary to understand the existing social systems and local power structures. To enable people to make informed choices, NGOs have an important role to play: promoting information sharing and community-based learning.
- **Recovery of local economy and livelihoods must a priority**
Helping people to recover their means of earning a living is central to reconstruction efforts. Economic recovery enables people to reduce their reliance on long-term relief; adding to self-motivation, dignity and a sense of purpose. Alongside direct relief to affected people, local markets, services and businesses that provide employment or support livelihoods more broadly also need to be assisted. Livelihoods recovery can be part of rebuilding homes and infrastructure, and is more likely when reconstruction avoids relocation of people or settlements
- **Reconstruction and recovery efforts must recognize diversity**
Communities and populations affected by disasters are not homogeneous. Different groups have different needs, different skills and capabilities. The particular needs of women, and other disadvantaged groups, must be taken into account.
- **Communities should be allowed to use their own resources wherever possible**
Recovery is more robust and sustainable when communities are able to draw on their own capabilities, social and economic resources. This provides an opportunity for local markets and businesses to grow, and for people to gain skills and confidence. Support to develop skills and capacities (through training) and access physical resources, encourages people to lead activities and take ownership of recovery processes.
- **Reconstruction must take account of future hazards and risks.**
Disaster risk assessments and decentralised disaster risk reduction (DRR) planning must be part of the reconstruction and recovery process. Decision-makers need access to intelligible forecasts about critical uncertainties such as the impacts of climate change

Issues for discussion at the session

The session on ***BBB in infrastructure: making it stronger and accessible to everyone*** brought together high-level representatives of three national governments to deliberate on the options for institutional and legal arrangements, policies and systems for application of BBB principle in infrastructure recovery processes. The Government representatives will share their experiences in managing infrastructure recovery and BBB application. The discussions in the session were informed by institutions and policies for BBB recovery based on best practices and lessons from several countries.

Panel Discussion : Panel Members

SPEAKERS

Ms. Armine, Hayrapetyan, Government of Armenia

Ms. Sandra Nedeljkovic, Government of Serbia

Mr. Kamal Kishore, Government of India

Mr. Stéphane Hallegatte, GFDRR Chief Economist

Mr. Max Wyss, ICES, Seismic Hazard & Risk Consultant

Emma Lovell, Research Fellow in the Risk and Resilience Programme at the Overseas Development Institute (ODI).

MODERATOR

Mr. Armen Grigoryan, *Regional Cluster Leader - Climate Change/Disaster Resilience and Global Energy Policy Advisor, Crisis Response Unit, UNDP*

Questions/Challenges to be discussed

The panel members will be requested to share their country level experiences based on the following questions:

- How have the institutional and legal arrangements for recovery in infrastructure sector been developed in countries? What are the systems and practices related to recovery and how did it help in making recovery process more effective?
- What are the policies and directives drafted to support applying BBB principle in Recovery? What are the key elements of these policies and directives?
- How is BBB recovery being pursued within the government, how is it planned and implemented? How do they relate to the DRR system of the country?
- How do we see more preparedness for BBB recovery in terms of capacities, systems, and financial mechanisms?

References

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