World Reconstruction Conference

Geneva, May 10-13, 2011

Recovering and Reducing Risks after Natural Disasters

PROCEEDINGS

Purpose of the Proceedings:

The presented papers introduce the substantive background information for the various thematic sessions. The findings of the discussions at the World Reconstruction Conference (WRC) will feed into the finalization of the papers as self-standing knowledge note publications and learning modules. In addition, they will serve as background reference for the preparation of the World Reconstruction Report.

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RETHINKING RECONSTRUCTION FOR A SAFER FUTURE – A WELCOME MESSAGE

While the world watches Japan as it begins to rebuild coastal districts destroyed by the East Japan Earthquake in March 2011, Haiti is still struggling to clear the rubble of its towns and cities ravaged by last year's earthquake and Pakistan faces an uphill task to recover livelihoods, villages, and schools washed away in the August 2010 floods. These catastrophes, unprecedented in force, scale, or the number of lives destroyed, were separated by only a few months. If the wake-up call to improve our approach to post-disaster recovery and reconstruction was ringing before, it is a deafening alarm bell now.

Fortunately, we're not starting from scratch. Together, the experience of governments, the international community, and civil society organizations has helped to define common lessons from post-disaster recovery and reconstruction. We now understand, for example, the important role affected people can play in their own recovery process, and that of their neighbors. We know that the rapid restoration of public services is critical. Above all, we recognize the role that good reconstruction can play in providing resilience to future disasters for the safety and prosperity of future generations, and that this is a development challenge for all. Applying these lessons consistently, however, demands greater leadership, collaboration, and support from the international community. No one country is equipped to meet this challenge alone.

The World Reconstruction Conference is the first of its kind - a pivotal opportunity to foster partnerships, streamline approaches, and plan for a future in which risk is on the rise. Policy makers, thought leaders, and frontline operators will share their diverse experiences from both developed and developing countries. The conference, taking place as part of the Third Session of the Global Platform for Disaster Reduction on May 8–13 in Geneva, is organized by the World Bank and the United Nations International Strategy for Disaster Reduction (UNISDR) with support from the Global Facility for Disaster Reduction and Recovery (GFDRR) and its partners.

The World Reconstruction Conference invites you to share, learn, and contribute to a common goal of a more effective, forward-looking approach to post-disaster reconstruction and recovery, one in which the opportunity to mainstream disaster risk reduction and climate change adaptation is not lost. The success of the conference depends on the active participation of everyone, and we are encouraged by the strong cooperation from around the world in the preparation of this event.

The discussion papers presented in these conference proceedings reflect some of the issues and topics to be covered by the conference. Together, they form the foundations for the World Reconstruction Report, scheduled for publication in the summer 2012.

We welcome you to the World Reconstruction Conference and offer our commitment to taking forward the recommendations as we move ahead together.

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ORGANIZERS

THE WORLD BANK

The World Bank has been involved in post-disaster recovery and reconstruction for more than 25 years with a trend of increasing lending for risk reduction and mitigation, mainly by integrating risk reduction into investment programs. Natural disaster assistance accounted for 9.4 percent of total World Bank commitments between 1984 and 2005. The number of disaster projects and investment volumes has risen gradually. Over the last six years, the Bank has approved US$9.9 billion for disaster activities. The Bank continues to invest in disaster risk reduction, including mitigation and disaster preparedness, as an integral component of poverty reduction and sector strategies.

GFDRR
Global Facility for Disaster Reduction and Recovery

Established in 2006, the Global Facility for Disaster Reduction and Recovery (GFDRR) is a partnership of 36 countries and 7 international organizations committed to helping developing countries reduce their vulnerability to natural hazards and adapt to climate change. The partnership's mission is to mainstream disaster risk reduction (DRR) and climate change adaptation (CCA) in country development strategies by supporting a country-led and managed implementation of the Hyogo Framework for Action (HFA).

ISDR

UNISDR was established in 1999 to facilitate the implementation of the International Strategy for Disaster Reduction and to serve as the focal point in the United Nations system for the coordination of disaster reduction and to ensure synergies among the disaster reduction activities of the United Nations system and regional organizations and activities in socio-economic and humanitarian fields. With the adoption of the Hyogo Framework for Action in 2005, UNISDR was tasked with supporting its implementation. UNISDR also coordinates the organization of the Global Platform for Disaster Risk Reduction.

PARTNERS OF GFDRR

International Federation of Red Cross and Red Crescent Societies

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WRC PARTNERS

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ACKNOWLEDGEMENTS

The World Reconstruction Conference (WRC) is the result of a strong partnership between the World Bank, Global Facility for Disaster Reduction and Recovery (GFDRR), and the United Nations International Strategy for Disaster Reduction (UNISDR), among many other contributing partners.

A special note of thanks goes out to the many partners of the WRC including: Asian Development Bank (ADB), Asian Disaster Preparedness Center (ADPC), Bangladesh Rehabilitation Assistance Committee (BRAC), CaLP, Community Practitioners' Platform for Resilience, European Union (EU), German International Cooperation (GIZ), Google, International Federation of Red Cross and Red Crescent Societies (IFRC), International Labor Organization (ILO), International Recovery Platform (IRP), Joint Research Centre (JRC), Lane Financial, Munich Re, National Institute of Disaster Management (NIDM), ReBuilDD, Save the Children, South Asian Association of Regional Cooperation (SAARC), Shelter Centre, Swiss Re, United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), United Nations Food and Agriculture Organization (FAO), United Nations Human Settlements Programme (UN-HABITAT), United Nations Children's Fund (UNICEF), United Nations Operational Satellite Applications Programme (UNOSAT), Water and Sanitation Program (WSP), World Vision, and World Health Organization.

We would also like to extend our gratitude to the International Advisory Committee who guided the development of the conference and ensured that the quality of the content was high-level, relevant, and timely. Very special thanks to them.

A big thanks to the Session Leaders who put in so much time and effort in organizing their sessions and developing the discussion papers presented in these Conference Proceedings. A special thanks to them, session speakers, and resource teams, as well as the entrants of the Innovation Competition, and the WRC team.

The WRC organizers would like to acknowledge the generous support of GFDRR and its donors, who contributed financing for the successful development of this Conference.

INTERNATIONAL ADVISORY COMMITTEE

An International Advisory Committee, comprised of key practitioners experienced with the implementation of large reconstruction programs and international experts in disaster risk reduction, has guided the development of the World Reconstruction Conference. These individuals have provided strategic leadership and their dedication has been critical to the success of the conference.

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ABOUT THE WORLD RECONSTRUCTION CONFERENCE

The World Bank, Global Facility for Disaster Reduction and Recovery (GFDRR), and United Nations International Strategy for Disaster Reduction (UNISDR), together with other partners, have organized the **World Reconstruction Conference (WRC)** for May 10-13, 2011 as a part of the Third Global Platform for Disaster Risk Reduction in Geneva, Switzerland.

WRC is the first large-scale global conference focused on natural disaster recovery and reconstruction, bringing together leaders, experts, policy makers, and practitioners from government, international organizations, NGOs, academia, and the private sector from both developing and developed countries to collect, assess, and share disaster reconstruction and recovery experiences and take forward the policy dialogue for an effective international disaster recovery and reconstruction framework.

Rationale

Disasters are increasing worldwide with more devastating effects than ever before. According to preliminary analysis by Swiss Re, natural and man-made disasters in 2010 caused economic losses of US$222 billion, up from US$63 billion a year earlier. These disasters also claimed significantly more lives with nearly 260,000 killed in 2010 compared with 15,000 in 2009. The earthquake in Haiti alone claimed more than 222,000 lives, and the floods in Pakistan affected more than 20 million – startling figures of a trend that is only anticipated to intensify with future climate change.

Major public interventions for reconstruction and recovery often follow after disasters, diverting scarce resources originally intended for development programs. It is vital, therefore, to rebuild and recover in a manner that is sustainable, contributing towards the development agendas and programs of disaster-affected countries. When there is a lack of institutional capacity, coherent planning, and coordination between stakeholders, the chance for

development is lost, funds are wasted, and the affected population is left additionally burdened. This phenomenon can be observed across the globe from reconstruction after Hurricane Katrina to haphazard recovery efforts after the earthquake in Haiti and the lack of preventative measures even after the numerous floods that occur every year in Sub-Saharan Africa.

Format

These and other challenging issues of disaster recovery and reconstruction will be addressed in diverse ways at the conference, including:

High-Level Policy Panel: A High-Level Policy Panel will set the stage for the conference with key challenges of reconstruction being debated with a selected group of prominent thought leaders from government, international organizations, media, academia, and civil society.

Innovation Competition: The WRC will host an Innovation Forum that will showcase the 71 entries from 32 countries submitted as a part of its 2011 Innovation Competition. In addition, the conference will feature presentations by the top 3 winners.

Thematic Sessions: The thematic sessions will discuss critical issues concerning Vulnerable Groups, Livelihoods and Local Economy, Urban Housing, Environment, Health and Education, Water and Sanitation, Risk Financing, Needs Assessments, Monitoring and Evaluation, Institutional Arrangements, IT Innovations, Fragile States, and Large-Scale Reconstruction.

Roundtable Discussions: Three roundtables will focus on Strengthening Local Recovery - The Key to Building Back Better; Rebuilding and Protecting Critical Infrastructure: Lessons from Japan and Other Countries; and The Way Forward: Moving Towards a Sustainable Reconstruction and Recovery Framework.

Expected Outcomes

- Providing a platform for recovery stakeholders from across the globe to share knowledge, experiences, and know-how for the first time on a number of complex issues in disaster recovery and reconstruction with the aim of ensuring that local communities receive what they need in reconstruction;

- Catalyzing processes to review and reflect on current reconstruction practices and to develop new thought leadership for more effective disaster reconstruction and recovery; and

- Developing proposals and recommendations for a global policy framework and key international standards for effective cooperation and coordination of recovery and reconstruction efforts.

Recommendations from the World Reconstruction Conference will be leveraged by the Global Platform's consultative process and included into the Chair's Summary. Also, material from the Conference, together with the discussion papers included in these Proceedings, will be key input for the World Reconstruction Report (WRR) to be finalized a year after the conference.

GFDRR, UNISDR, and the World Bank are committed to carrying forward the recommendations of the Conference as a part of the continued effort towards disaster risk reduction.


World
Reconstruction
Conference

RESPONDING TO NATURAL DISASTERS

– A LONG IGNORED DEVELOPMENT CHALLENGE?

The World Reconstruction Conference High-Level Policy Panel will address pressing issues of disaster recovery and reconstruction. The Panel is comprised of a prominent group of policy makers from government, multilateral and bilateral organizations, civil society, and academia.

This interactive session will center on the following issues:

RECOVERY AND RECONSTRUCTION: HAVE WE LEARNED THE LESSONS OF THE PAST?

When new catastrophic events occur, the response of the affected country as well as the international community often appears to be ad-hoc and improvised. While guides and analyses do exist at the operational level to some extent, they are not necessarily embedded in the larger recovery policy and strategy formulation. What are the systemic challenges that cause the same problems to be brought up in reconstruction experiences in geographies around the world and what needs to be done to help move the international community forward?

WHAT YOU'RE PROMISED AND WHAT YOU GET:

How to ensure communities get what they deserve: There is an obvious gap in many disaster recovery experiences between the reconstruction promises made to communities and what is actually delivered on the ground. Is this due to donor fatigue or systemic failures or inefficiencies in the international recovery architecture?

PREVENTION PAYS… BUT WHY ARE WE NOT INVESTING?

Disaster vulnerability and risks are well known and recent evidence from Natural Hazards, *UnNatural Disasters – the Economics of Effective Prevention* shows that prevention, if prioritized, pays off in the end and is cost-effective. Why then are we not investing in it? What are the constraints for proactive investment to finally make communities safer?

RECOMMENDATIONS GOING FORWARD:

The Panel will discuss what is needed at the global level to catalyze more efficient and coordinated reconstruction and recovery, and what should be the first priority of the disaster reconstruction community.

URBAN HOUSING RECONSTRUCTION

AND LAND MANAGEMENT

by Shahnaz Arshad and Suhaib Rasheed

1. INTRODUCTION

In the new urban millennium, natural and human disasters are likely to have their greatest impact on cities of all sizes, where more than half of humanity currently resides. Large cities and megacities concentrate and magnify risk, but smaller cities (less than 500,000 residents), home to just over half of the world's urban population, also experience exposure to multiple risks.

While disasters may have catastrophic effects on both urban and rural populations, their impact is far greater on urban areas due to a variety of reasons. Furthermore, in the aftermath of disasters, natural and otherwise, there are a number of additional aspects that warrant attention in an urban setting that are not as vital to a rural recovery and reconstruction program.

The largest financial item in post-disaster recovery programs consistently comprises the reconstruction costs arising from damage to private housing stock. This paper attempts to list salient concerns peculiar to a housing reconstruction program targeting an urban population, and proposes remedial actions in light of experiences and best practices undertaken globally by a wide variety of national and international agencies and organizations.

Another issue regarding the nature of post-disaster urban housing reconstruction programs involves the general distinctions between design and implementation of such programs in developed countries as compared to developing countries. The scope, as well as the objectives, of housing reconstruction programs for urban settlements in the developed world is typically much wider. This is proportionate to both the financial value of damages

incurred, and the available fiscal resources in the public as well as the private sector. Insurance coverage for housing properties remains low in developing countries and the scarce resources made available by national governments and the international donor community need targeted and highly optimized allocation plans.

Finally, it is important to emphasize that while financial support and technical assistance for reconstruction programs are generally available from international agencies, the role of the affected government as well as the general population is of much higher importance in effecting recovery. Global experience with disasters suggests that in the aftermath of most disasters, the affected population immediately mobilizes in creating the conditions for the resumption of life and economy. These efforts are the natural expression of the population's will to survive with or without external reconstruction assistance, and must form the bedrock upon which any intervention is built for humanitarian relief, early recovery, or reconstruction.

The contents of this paper have been generated through available reports by the World Bank, UN agencies, and other organizations, as well as original research carried out in preparation of the World Reconstruction Conference.

2. GENERAL CHARACTERISTICS OF DISASTER EVENTS IN AN URBAN CONTEXT

Characteristics of Urban Areas and Impacts of Disaster

a) While both rural and urban areas are exposed to disaster risks, their potential impact is likely to be far greater on urban areas due to higher concentrations of populations. Similarly, urban areas are far more vulnerable to anthropogenic disasters such as fires, accidents (collapse of buildings, bridges), etc.
b) The disruption of essential services due to damage inflicted on service delivery infrastructure has a greater impact on urban populations owing generally to a higher dependence on such services, as well as the greater

number of services being provided (transport infrastructure, electricity, lighting, water and sanitation services, health and education facilities, economic infrastructure, etc.).

c) Due to the relative sophistication of the means of livelihood employed by urban populations, their adequate resumption requires a higher degree of planning and effort. The means of livelihood may also have critical ties to spatial location, housing design, and wider social and communal networks, rendering their adequate replication more complicated, especially in a fresh setting.

d) Urban settlements may be home to disproportionately large sections of poor and vulnerable populations, having informal, illegal, temporary, or insecure tenure/land-ownership in most cases. Generally, these populations are the worst-affected in a post-disaster situation and are in the greatest need of assistance due to the absence of support systems, coping capability, and safety nets.

e) The effects of poor governance and urban land practices, inadequate planning (land use plans, disaster management plans, and otherwise), inefficient land administration systems, social risks, and economic vulnerabilities are exacerbated in the aftermath of a disaster. Furthermore, relief efforts might encounter serious problems due to inadequate access to infrastructure and evacuation routes.

f) Immediately following the disaster, the rescue and relief efforts run a risk of inflicting greater environmental damage within urban areas (such as the unsafe disposal of debris into water and drainage channels) that tend to aggravate the risks of future disasters. Moreover, critical ecological assets in the vicinity of urban settlements such as mangroves and forestation are at an increased risk due to the wide appetite for land and building materials (e.g., timber) during the reconstruction phase. The damages inflicted on such infrastructure and ecological assets not only have extremely adverse environmental effects but also render the urban settlements more vulnerable to future disasters.

g) In comparison to most rural settlements where communal structures and social organization are established to a much greater degree, urban settlements are generally characterized by weaker social networks. Even when the degree of integration and cohesion may be high within certain

communities inside the wider urban fabric, these generally tend to materialize as partisan localized affiliations instead of the wider social cohesion encompassing the whole community in a rural setting.

h) The variable extent of damage inflicted on individual communities (with informal settlements generally bearing the brunt of the damage) as well as the dynamics of real estate markets in a post-disaster situation also aggravate feelings of marginalization, disenfranchisement, insecurity, perceived prejudice/bias, and inequitable treatment among respective communities within a single city. The fluctuations in real estate prices as well as insecurities on part of owners related to land ownership and tenure tend to make it difficult in some cases to acquire land for temporary shelters in safer areas within the proximity of the city/town amidst the relative chaos following a large-scale disaster.

Advantages and Disadvantages Offered by Urban Areas for a Post-Disaster Recovery Program

Urban areas do provide some important **opportunities** in the recovery and subsequent reconstruction phase:

a) Urban areas possess stronger capacity within the governance sector, both at local government and higher levels.
b) They enjoy a greater focus of efforts, at least in the initial stages, during the recovery and relief phase.
c) Private sector capacity, both financial as well as operational, is greater in urban areas, especially in the construction sector.
d) The extent of housing and asset insurance also tends to be higher, especially in developed countries, where such market practices are the norm within real estate and housing sectors.
e) There is a greater chance of attracting private sector investments to support the reconstruction objective and suitable opportunities need to be introduced within urban reconstruction programs to this effect.
f) Urban areas may also boast of higher literacy levels, particularly in developing countries, which may translate into greater efficacy of communication initiatives undertaken by the recovery and reconstruction agencies.

g) Urban areas generally exhibit a lower extent of population displacement and greater physical proximity between the locations of temporary shelters set up during the early recovery phase and the permanent housing sites of the affected population residing within these shelters.

Conversely, some **challenges** are also generally peculiar to urban areas:

a) Land is scarcely available in urban areas for setting up temporary shelters as well as catering to relocation needs.
b) Rubble removal and adequate disposal is more difficult due to lack of space.
c) Disaster risk management objectives require more complex initiatives to take effect within urban areas, particularly if these involve permanent relocation for any part of the urban populace. Any kind of permanent relocation is also harder due to the presence of economic and social linkages that are not easily replicable in new sites.
d) Land-ownership and tenure issues are more complicated in urban areas and affect a greater proportion of the population.
e) Damage to infrastructure and service delivery networks is greater in urban areas and presents additional financial assistance requirements as well as longer program completion timelines for effective rehabilitation and resumption.
f) Risks of replicating pre-existent vulnerabilities must be avoided, such as those of the most vulnerable urban population housed in informal settlements.
g) Risks of environmental degradation are higher, and greater planning efforts are required to adequately address them. Emergency response efforts are also more difficult, resulting in more costly interventions.
h) Any objectives of disaster risk reduction and environmental and service delivery improvements are also linked to wider town-planning and urban management issues. Such issues merit far greater focus and attention in an urban context and hence the links between urban reconstruction programs and long-term urban development objectives are also stronger.

3. DESIGNING AN URBAN HOUSING RECONSTRUCTION PROGRAM

Successful recovery is ultimately about rebuilding sustainable settlements, complete with infrastructure, land tenure, livelihoods, and governance structures, through a participatory planning process that addresses the underlying risks that contributed to the crisis.

Information and Inputs Needed for the Design Process

The data required for designing the Housing Reconstruction Program subsequent to a PDNA may be furnished through a number of different assessments, including detailed ones of housing damages, land risk, land tenure, governance and implementation capacity, social risk and vulnerability, infrastructure and service delivery, economic activity and livelihoods, environment, and land availability.

In recent years, the Owner-Driven Approach (ODA) has been widely employed as the regime of choice for undertaking housing reconstruction programs.

Reconstruction Approach Options

There is a spectrum of housing reconstruction interventions that have been employed for providing assistance to home owners. The major issues that have influenced the choice of one reconstruction approach over another in an urban context are:

- Owner-Driven Approach (ODA) vs. Agency-Driven/Community-Driven Approach (ADA/CDA);
- In-Situ Reconstruction vs. Ex-Nihilo (or Relocated) Reconstruction; and
- Single-Family Reconstructed Housing Units vs. Multi-Family Reconstructed Housing Units.

Owner-Driven Approach (ODA) vs. Agency-/Community-Driven Approach (ADA/CDA)

In recent years, the Owner-Driven Approach (ODA) has been widely employed as the regime of choice for undertaking housing reconstruction programs,

especially within the developing world. Globally[1], ODA has proven to be highly effective and successful in a wide variety of socio-economic, multi-cultural, post-disaster scenarios. There are some obvious merits, at least in principle:

a) The approach represents a cost-effective, swift, robust, resilient, flexible, dynamic, and transparent method for providing assistance to disaster-affected populations.
b) The beneficiary satisfaction levels have been witnessed to be significantly higher[2] compared to ADA/CDA, due to the greater degree of control over the actual reconstruction process afforded to affected house owners.
c) The house owners are empowered to settle for a layout and design of their own choice, employing an acceptable construction technique from among an array of options. These options are often customized according to socio-cultural and historical building practices prevalent within the geographical area, generally provided by the housing reconstruction program.
d) The number of rooms as well as other housing features may vary according to individual household needs.
e) In terms of assistance provided, whether in the form of cash grants, loans, construction materials or in-kind assistance, or technical assistance (TA), the beneficiaries retain the choice to complement these with their own resources.

In practice, there are some notable **issues** that need to be highlighted with ODA:

a) The experience to date with ODA argues against the widely believed assumption that the beneficiaries undertake this work by themselves. In most cases, beneficiaries have been observed to have employed skilled labor, masons, construction workers, and/or contractors from the local market for the actual reconstruction. While this practice is completely acceptable within the ODA framework, it does serve to highlight that the main difference between ODA and ADA, largely, is that the contractors or hired laborers are accountable to house owners instead of agencies.

[1] Examples include: Post Earthquake Reconstruction in Gujarat, India (2001); Post Tsunami Reconstruction in India and Sri Lanka (2004); Post Earthquake Reconstruction in Northern Pakistan (2005); also, under the guise of "Aided Self-Help Schemes" for providing housing assistance to the poor in many parts of Latin America.
[2] Barenstein (2008) presents a comparative survey analysis, presenting recorded satisfaction levels compiled against different aspects of interest, to this effect.

b) ODA requires extensive training and inspection programs to safeguard the disaster risk mitigation and build-back-better (BBB) objectives of the reconstruction program.
c) The training programs for house owners as well as skilled construction labor should start ahead of the physical reconstruction phase, generally last throughout the reconstruction program, and should be adequately inclusive to address the needs of vulnerable groups (such as female-headed households, households headed by minors, etc.), as well as other house owners who are lacking the knowledge, skills, and experience needed for construction.
d) The inspection program, on the other hand, should preferably be tied to the assistance program. A multi-tranche assistance program with each release conditional upon inspections and clearance by relevant teams is recommended as the instrument of choice for this purpose.
e) While ODA may perhaps represent the sole viable option for reconstructing stand-alone houses located on their own plots, ADA and CDA seem to present major advantages for multi-family units in dense urban areas.
f) ODA may prove more difficult to implement in relocated communities and poor communities with no building experience (e.g., slums).
g) Measures need to be taken to prevent inflation and ensure access to quality construction materials.

Thus, for ODA to succeed, it is critical to establish support systems for home owners that are responsive to local requirements; establish delivery mechanisms for financial assistance that are easy to understand and access; ensure that building codes are based on local building technologies and materials; ensure adequate training for tradespeople and construction supervisors; provide special attention to vulnerable groups; adopt measures to prevent inflation and acknowledge housing rights; and accommodate special needs (tenants, squatters, the homeless).

Under an Agency-Driven Approach (ADA) a lead agency retains control over the physical reconstruction, often hiring a contractor, or a number of contractors, for this purpose. The implementing agency retains a higher degree of

control over the design and specifications of reconstructed housing stock under such an arrangement and may strive to guarantee compliance with the disaster risk mitigation and BBB objectives of the program, or to utilize new building techniques in reconstruction. However, there are a number of issues that have been observed with this approach. Salient issues in this regard include:

a) Higher financial overheads;
b) Lesser beneficiary control over the architectural design, size, and configuration of reconstructed housing units;
c) Uniform appearance and design of housing units constructed with a lesser degree of customization with respect to individual housing needs;
d) Fewer opportunities available to households to complement the assistance package using their own funds; and
e) Lower beneficiary satisfaction generally witnessed as a result.

In comparison to ODA, ADA remains inherently less suited to devolving complete control to individual house owners who might consequently feel marginalized among the larger actors.

ADA has at times been used in a more flexible fashion with communities encouraged to participate in the rebuilding exercise more fully. This is generally termed as a Community-Driven Approach (CDA). CDA generally requires a greater degree of community organization for its successful implementation with community construction committees or similar organs often set up for the management and oversight of reconstruction works on site. The exact arrangements in terms of contractor accountability may vary; at times it is retained by the lead agency, and at others devolved to communities to a great extent. Similarly, communities may be empowered to contribute to the choice of design, construction materials, and building techniques, although the configuration of the unit (size, number of rooms, etc.) generally remains uniform. In addition, communities generally need to be provided training and skill development opportunities either for the purpose of adequate oversight of work by contractor/hired skilled labor, or for the wider purpose of actually undertaking the construction works themselves. Finally, urban populations often lack the degree of organization needed for an effective CDA and may

need special efforts for achieving this level of mobilization. Special mechanisms may also need to be instituted to guard against community reconstruction committees getting unduly dominated by either the local elites or the building contractors.

In-Situ Reconstruction vs. Ex-Nihilo Reconstruction

In-situ reconstruction invariably remains the preferred approach for rebuilding damaged housing, unless there are very serious reasons that demand a relocation of any part of the urban population. In-situ reconstruction often represents the cheaper, simpler, and faster option for rebuilding affected houses. In addition, vital social, cultural, and economic linkages for each household are maintained with the original site and neighborhood. Owner-driven reconstruction enjoys clear advantages over other approaches in case of in-situ reconstruction.

There may be various factors that recommend or necessitate a relocation/resettlement of a section of, or in some cases all of, the population within an urban area. Such factors include disaster risk mitigation considerations (such as site-specific vulnerabilities), loss of inhabitable land, serious urban management and land use issues, slum upgrading, insecure or temporary tenures for pre-disaster residents from illegal squatter settlements, etc. In practice, almost all urban housing reconstruction programs involve at least some cases where resettlement is warranted. However, it is vital that the economic, social, and environmental costs of relocation should be carefully assessed before the decision to relocate is finalized, and other mitigation options should be exhaustively considered.

Single-Family Reconstructed Housing Units vs. Multi-Family Reconstructed Housing Units

Urban areas often have a number of multi-story or multi-family housing units due to reasons of population density, limited land availability, local settlement culture, as well as existing capacity for the building of multi-story structures within the local construction industry. The land-ownership and tenure arrangements within such buildings are typically more complex as compared to single-family accommodations. In a post-disaster situation, such collective

occupancy of multi-story housing structures may be a factor arguing for the reconstruction of similar structures. While single-family housing units may be ideally suited to rebuilding through an owner-driven approach (ODA), the construction of multi-story buildings is generally undertaken via an agency- or community-driven approach (ADA/CDA) due to the higher knowledge and skill requirements, as well as lack of clear individual ownership of the building process.

Program Design Considerations

Beneficiary selection must be the first step when designing any housing reconstruction program. The collected data from the Detailed Housing Damage Assessment is the primary input to this process. The eligibility criteria for the program can be devised based on this assessment and should aim to be adequately inclusive to address the needs of the most vulnerable sections of the urban population. These populations include occupants of illegal settlements on public lands or occupants having insecure legal tenure, temporary inhabitants or renters, etc. The needs for these groups may be addressed either within existing legal frameworks or using specialized program instruments. Such instruments may involve developing and providing new residential land with protected tenure to the landless urban inhabitants, recognizing informal/illegal tenure of some residents through slum upgrading initiatives, or relocating such landless groups to multi-family, multi-story housing. Regarding the issue of renters and residents with temporary tenure, interventions that may be considered include: (a) providing direct assistance to either the tenants or the landowners for the reconstruction of rented housing properties on the condition that an agreement be reached between the involved parties to the effect that the renter may occupy the same property at an agreed rate for a minimum duration in keeping with relevant legal provisions; or (b) providing tenants with alternate accommodations at a relocated site. The effective communication of the eligibility criteria to all the affected population is essential to ensure fair and equitable opportunities.

The nature, type, and size of assistance to households depend upon factors such as the finances available and the number of affected households. The type of

assistance may vary from program to program, or across different beneficiaries within a program. The typical types of assistance provided include: (a) direct cash transfers (either single- or multi-tranche); (b) conditional cash transfers (based on an inspection and compliance assessment program); (c) in-kind assistance (usually tools and construction/building materials); and (d) technical assistance (both in the form of trainings and recommendations).

The assistance program may be designed either as a uniform assistance program with the same size of assistance made available to each beneficiary, or a proportionate-assistance program with the size of assistance depending on the value of damages incurred upon individual housing units. A uniform assistance package is generally announced with view to considerations of equity. However, such a program might prove the only viable option owing to a lack of adequate information available for proportionate assessment. These gaps in required information may be due to land and tenure records providing insufficient data regarding land values, especially within developing countries, or due to a below-par detailed damage assessment for affected housing stock.

Finally, financial assistance extended to beneficiaries is often provided in the form of materials, grants, or low-interest loans. The housing reconstruction program may offer both grants and loans to beneficiaries depending on economic resources available to the beneficiaries, with the poor and vulnerable populations receiving grants and other beneficiaries offered soft loans. In addition, loans may be provided for the construction of houses for landless communities, provision of houses to tenants and renters, or for providing shops or other economic infrastructure for interested beneficiaries.

4. ISSUES OF BENEFICIARY SELECTION

Eligibility Criteria for Urban Housing Reconstruction Programs

Increased urbanization coupled with the entry problem for new or poor urban dwellers in a formalized housing market has resulted in large sections of urban populations with insecure tenure and without definitive legal titles or full ownership of housing properties. These include rural migrants, workers in informal economic enterprises, temporary residents with formal or informal contracts/arrangements, and inhabitants of informal or disputed settlements, among others.

In most housing reconstruction programs, tenure documentation and legal proof of rights are made prerequisite for establishing beneficiary eligibility to the program. While the underlying reasons for making this an essential condition for participation in the assistance program are evident, this approach does tend to raise issues of exclusion, especially for many cases involving the poorest and most vulnerable households within the affected populations. These segments often comprise residents of urban settlements with insecure (temporary or informal) rights of tenure.

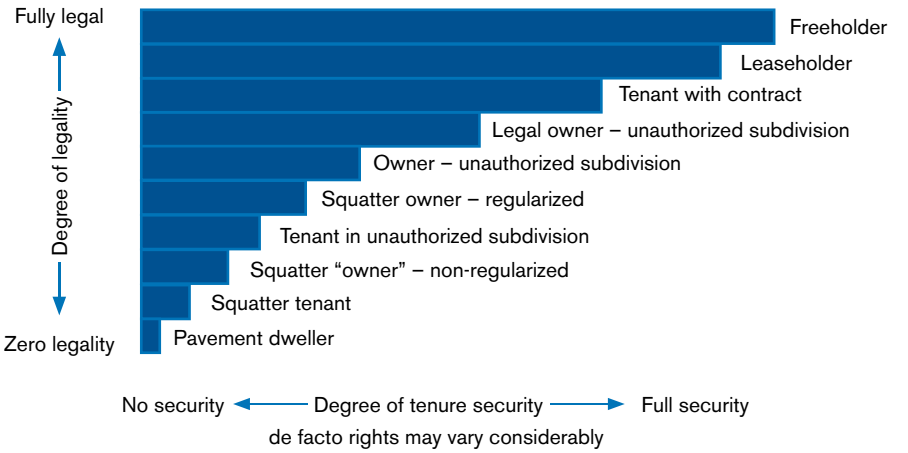
Urban populations with temporary or insecure tenure are generally quite sizable, as evident from the data presented below:

Figure 1. Urban Tenure Insecurity, by Region (Percentage)

	Squatters (no rent)	Renters	Other	Total
Southern Africa	8	16	6	29
Rest of Africa	13	30	7	50
China	5	2	8	15
East Asia and Pacific, excluding Australasia	7	26	9	41
South and Southeast Asia	14	31	5	50
Middle East	8	28	6	42
Western Europe	2	19	4	25
North America and Australasia	1	10	4	16
Latin America and the Caribbean	11	17	6	34
World	7	17	4	28

Source: Flood (2001).

Figure 2. Urban Tenure Categories by Legal Status



In a post-disaster recovery program, housing and property restitution measures may be used as a means of ensuring secure tenure and facilitating the rebuilding of homes for all persons affected by disaster. This may require the enactment of new legislation or introducing flexibility to existing tenure regulations.

The Global Report on Human Settlements (2007) published by the United Nations lists multiple categories of non-ownership tenure and the corresponding legal rights and security.

Populations of the urban poor that lack tenure security need a place in planning reconstruction solutions. They have few or no savings to protect themselves in crises and enjoy fewer employment options when an adverse natural event undermines their means of livelihood. Beneficiary selection criteria for an urban housing reconstruction program should be developed after a careful analysis of tenure security issues. In normal circumstances, slum upgrading and tenure regularization represent the most common policy responses to illegal settlements throughout the world. Similarly, in a post-disaster recovery program, housing and property restitution measures may be used as a means of ensuring secure tenure and facilitating the rebuilding of homes for all persons affected by disaster. This may require the enactment of new legislation or introducing flexibility to existing tenure regulations.

5. LAND ADMINISTRATION AND TENURE SECURITY

Land-Tenure Issues in an Urban Reconstruction Program

In urban areas, security of tenure is critical for reconstruction, social and economic recovery, and for restoring urban livelihoods, which in many cases may be home-based enterprises or other activities based in the informal economy. A first step in the repair and reconstruction process must be the identification of ownership or occupancy rights. Gaps in tenure records, illegal settlements, and needs for relocating certain communities (due to loss of land or safety considerations) may also result in residual caseloads of people without access to land after a disaster. The urban reconstruction planning process should therefore respond to issues of land rights and titling, discrepancies in the administration of land records, the needs of informal occupiers of land, and work with them to identify viable alternatives. Laws, regulations, plans, and institutional frameworks should form the basis of reconstruction planning. If existing instruments are not realistic, or are contributing to informality, the reconstruction process must be used as an opportunity to improve them.

Tenure Records and Tenure Confirmation

Existing repositories of land records with the relevant authorities form the primary as well as the only strictly legal counterpoint datasets for verifying tenure and land-ownership claims. However, these might be either severely depleted due to the effects of disaster, or simply incomplete/out-of-date to begin with as a result of poor institutional practices and weak land administration systems. The latter situation is extremely common in developing countries. In such cases, alternate sources of land information may be considered as entry points, though it must be remembered that the status of any unofficial information can only be purely indicative. These may serve as one stream of data to a comprehensive post-disaster tenure/land-ownership confirmation exercise.

Typical sources for the acquisition of land and tenure entitlements include support from the government land registry agency to verify land records; recovery of damaged paper records through digitization or freeze-drying

techniques, etc.; and existing maps, pre-disaster satellite imagery, and/or aerial photos. In the absence of written documents, information may be collected through community-based mapping and certification procedures to collect information on the demographics and tenure status of residents, and on the physical boundaries of affected housing plots and buildings. The community-based mapping exercise will also help determine whether the family residing in each property is an owner of the house they occupy, or a renter. It must be noted, however, that a community-based mapping exercise may only result in basic plot identification and an exact demarcation of boundaries may prove to be beyond its scope in practice. Similarly, a settlement of land disputes cannot be attempted by any extra-legal apparatus.

The post-disaster tenure confirmation initiative must be undertaken under competent authorities, although the support of non-governmental organizations (NGOs), civil society organizations (CSOs), community outreach groups, and other similar actors or forums may be enlisted in a subordinate facilitator role. This exercise might require significant capacity-building for those who will use and update land information, including human resources for planning and implementation as well as computer hardware/software to back up and preserve existing records. Special measures such as reduction or removal of fees associated with the issue of post-disaster tenure documentation, relaxing of legal evidence rules to remove obstacles to documentation, as well as special public information campaigns to disseminate information on land policy and rights to the public may be undertaken for the swift resolution of tenure-confirmation and land ownership issues.

Tenure Protection in Post-Disaster Situations

A clear commitment on the part of national authorities to protect property rights is critical in avoiding tenure insecurity, large-scale land grabbing, and speculation. The Government must act swiftly and firmly to protect pre-disaster property rights, regardless of whether they were formally registered or not. Key measures here may include: early communication of the government's commitment to tenure protection; the unambiguous endorsement of pre-existing property rights; imposing a temporary freeze on land

transfers to protect victims from being coerced by speculators and land grabbers; and the waiving of first-time registration fees and land taxes.

Owing to the complexity of the tenure situation in most urban areas, special attention should be paid to make provisions for simple, transparent, and explicit rules regulating the rights of pre-disaster renters of buildings or land in order to secure their continuing access and occupancy of their repaired or rebuilt dwellings. The tenure classification will further be based on whether the owner resides in the neighborhood or is an "absentee owner", and whether the land on which the house is constructed is owned by the owner of the house. The reconstruction program must retain its pro-poor focus, and hence seek to address the housing requirements of renters who are highly vulnerable to the impacts of a disaster due to either an inability to continue rent payments following a loss of livelihood or insecure/expiring rent arrangements with the landlords inhibiting their return to former quarters. Furthermore, the loss of rental housing assets at such a large scale also significantly destabilizes supply in the rental markets, thereby impacting tenants/non-owners. One option to assist renters involves direct cash grants to renters for an interim period after the disaster to meet the rent requirements, provided that the rental housing has not been destroyed. Otherwise, tenants may receive direct assistance tied to reconstruction or repair of their rental housing, subject to continued tenure and consent from the landowner. Another option here involves providing assistance to landlords for reconstruction of rental housing, conditional upon continuing previous rent arrangements for a grace period. Finally, as a last resort, renters may be provided alternate housing, either in a single-family housing unit or a multi-family development, at a relocated site.

Affected urban inhabitants formerly employing informal/illegal housing arrangements often belong to the poorest and most vulnerable section of the population. Possible solutions here might include: relaxing restrictions on legal tenure recognition and granting rights to land either immediately or incrementally, hence qualifying the resident as a beneficiary; provision of alternate land plots, with full ownership rights, or an equivalent longer-term arrangement, at a relocated site within the urban areas; or the resettlement of such affected population in multi-story, multi-family developments. It is,

however, critical that any proposed relocation programs involving residents with temporary or illegal tenure needs to be designed with the full participation of the affected communities. Voluntary relocation arrangements are recommended in such cases.

Another significant land-tenure issue might involve certain households with fully legal ownership and entitlement against land, housing, and property that is located within urban areas that have been rendered uninhabitable due to disasters; locations identified as high-risk sites unsuitable for urban settlements through the post-disaster land risk assessment; lands that are needed for the construction of service delivery networks or other infrastructure; or land within previously settled areas having their former status redefined within modified urban zoning laws and land use plans. These house owners need to be provided with alternate land plots at another urban site. As opposed to pre-disaster temporary and illegal occupants within urban areas, this represents a case of forced relocation, and every effort should be expended to ensure the adequate provision of social and economic opportunities, construction of required infrastructure, and delivery of services. The allotment of a plot of land corresponding to the size of original holdings is recommended in case of such relocated beneficiaries.

6. URBAN LAND USE AND SPATIAL PLANNING

Issues of Land Use in Urban Areas - Pre-Disaster Situation

The populations of urban areas, especially in the case of developing countries, are often growing at a faster pace than anticipated from historical evidence, owing to the phenomenon of rapid urbanization where the unique status of urban centers as the "engines of economic growth" serves as a powerful magnet for the surrounding rural populations. This translates into further pressure on already stretched resources of adequately developed inhabitable land as well as service delivery infrastructure. Consequently, large sections of the population consist of poor and vulnerable groups, often migrant families residing in undeveloped squatter settlements or illegal housing units generally constructed

on encroached public lands, which make further claims for legal recognition of ownership and access to both infrastructure and municipal services.

Post-Disaster Land Issues

Large-scale disasters expose existing gaps in urban land use planning and land administration systems. Consequently, there might be numerous factors related to land use that pose serious challenges to housing reconstruction programs in urban areas. These include loss of urban land (settled land rendered uninhabitable or unsafe due to landslides, submersion, contamination, etc.); insecure tenure; weak land administration systems and unclear land titles; housing on encroached land; developments on land vulnerable to natural hazards (such as flooding or over seismic fault lines, etc.); previous land use plans deemed unsuitable for mitigating hazard risks; and limited resettlement options available for displaced persons. Effective land use planning is necessary to prevent unsustainable reconstruction of settlements on unsafe land.

Where planning processes did not work before a disaster, it is unlikely that they will work at the time of recovery.

Land-Use and Urban Planning Objectives of a Reconstruction Program

Post-disaster situations can at times fast-track urban change. The widely held view that "financial assistance should be provided to restore original conditions" results in the urban planning dimension often getting neglected within reconstruction programs. But where planning processes did not work before a disaster, it is unlikely that they will work at the time of recovery, when planning decisions ought to be made.

The primary objective of spatial planning is to provide structures for growth of different urban markets, together with the allocation of land resources for public and environmental services. One of the issues in post-disaster land use planning is to revitalize urban property markets, including those which serve marginal segments (low incomes, weak tenures, vulnerable). Urban land-use and settlement planning encompasses spatial and strategic planning to facilitate urban growth and economic development; site layouts and development plans for communities and neighborhoods; zoning areas for types of

use (residential, commercial, green space); infrastructure and service delivery; and environmental management and protected areas.

Post-disaster land use planning must help identify the preferred land uses that will support local development goals. Similarly, emergency recovery projects such as urban renewal or intensification, economic center rehabilitation, and heritage restoration initiatives, can be integrated with long-term development planning to allow for improved land use post-event. Planning at local administrative levels based on land use plans may be used as an efficient way of identifying needs and project requirements, as well as the means to underpin reconstruction and rehabilitation in the preliminary stages of the planning process. It uses the land use plan as a framework to propose the optimal physical infrastructure for a settlement or area, including infrastructure for public services, transport, economic activities, recreation, and environmental protection. Authorities and donors may choose to use this approach as the basis for a systematic and coordinated plan, linking settlements with infrastructure networks including water and sanitation, drainage, and roads developed and retrofitted for housing or settlements already constructed.

However, the need for planning must not be allowed to delay the actual reconstruction program unreasonably.

7. DISASTER PREPAREDNESS AND DISASTER RISK REDUCTION

Land Use Planning and Disaster Risk Management Objectives

Unsustainable land use in urban settlements may refer to residential areas located on steep hillsides, in flood plains, water catchments, or seismically unstable areas which constitute major hazard risks. Destruction of natural protections surrounding an urban area (such as forests and mangrove swamps) may also take place through unsustainable settlement and land exploitation. Furthermore, instances of poor urban planning such as actual settlement patterns not following city boundaries, as well as non-conformance to zoning by-laws, building codes, and construction standards, all contribute to

vulnerabilities. Such vulnerabilities within urban areas, such as location of industrial plants within residential zones, may increase the risk of secondary hazards following a natural disaster substantially.

A large-scale disaster in an urban area not only highlights some of the risks and vulnerabilities rooted within the urban environment, but provides the possibility to address these risks within the reconstruction phase to protect against similar disasters in the future. A land risk identification, mapping, and assessment exercise may be undertaken as a first step under the reconstruction program. This involves comprehensive hazard risk identification and mapping surveys. A comprehensive assessment must also analyze how existing land uses contributed to disaster impacts and determine how regulations should be modified to reduce future disaster risk.

All reconstruction and recovery plans must be developed with the objective to pro-actively reduce or avoid the level of impact of a future hazard event. Urban settled areas that can be rebuilt without any changes in land use should be clearly identified. Similarly, areas and neighborhoods that are at higher degrees of risk should also be clearly demarcated so that large-scale prohibition of return and reconstruction in hazardous areas should be applied only in severe cases of high vulnerability. The extreme case is the establishment of 'exclusion zones' where hazards to natural disasters are the highest; examples in this respect include specific urban and peri-urban areas in Balakot (Pakistan), Managua (Nicaragua), and Guatemala City (Guatamala), where seismic risk was found to be extreme and therefore settlements were not permitted unless at very low density. It is very important to assess disaster risk and vulnerability, and to formulate development control regulations that respond to it. Typical regulations of this nature may require the mandatory incorporation of specific hazard-resistant design and construction features in all building structures within a certain sub-district, or the attempt to limit land use in certain areas to achieve low-density settlement patterns.

8. COMMUNITY ORGANIZATION AND DISASTER RESILIENCE

The sheer size of an urban population rules out the existence of secure and well-established communal ties binding the communities that are characteristic of most rural populations. Urban communities are inherently fragmented and community bonds are generally localized. Integrating the community on such a vast scale requires considerable and sustained efforts on the part of civil society organizations, non-governmental organizations, or other agencies. Experience from past disasters demonstrates that these efforts prove instrumental towards achieving effective community involvement in successful reconstruction programs, as well as building resilience and addressing vulnerabilities under the disaster risk reduction objectives of any program. Programs have faltered where the essential ingredients of community involvement and participation have been overlooked. It needs to be reiterated that community disaster preparedness is one of the most important objectives for effective disaster risk reduction.

9. RECONSTRUCTION FINANCING AND FISCAL RESILIENCE

Since the impact of a disaster may exceed a country's resources and capacity to respond, it requires a careful assessment of available options to limit undue exposure of scarce resources before the final scope of any government-funded reconstruction program can be decided upon. Natural disasters have a very high impact in low-income countries, which are generally more vulnerable to disaster damage because of their lack of effective risk management systems, the prevalence of low construction standards, and uncontrolled urbanization. Larger developed urban/national economies are more likely to absorb and spread the economic burden of disaster impacts.

While insurance cover available to affected home owners may be a primary defense mechanism against such financial contingencies, its prevalence varies significantly across countries and economies. Maturity of insurance markets (in terms of coverage, adequacy of cover, and affordability) and procurement of insurance cover might represent a norm or even a legal requirement in developed

countries, but be completely or largely absent in the developing world. Even in the former, actual purchase of insurance is typically far less common than legally mandated, and the sheer scale of damages and the size of aggregated claims may overwhelm private sector insurance companies, reinsurers, and risk underwriters. Thus, depending on the design of catastrophe risk insurance models, such liabilities may end up with the government as the final guarantor. Conversely, smaller or weaker economies find it hard to absorb the financial impacts of disasters because of: (i) limited budgetary capacity preventing sufficient financial reserves; (ii) difficulty in cross-regional subsidization of recovery efforts due to limited size and economic diversification; (iii) high debt levels limiting access to credit after disasters; and (iv) limited access to catastrophe insurance due to the high transaction costs resulting from the relatively small level of business brought into these markets.

Thus, the need for some form of direct government assistance is more acute in developing countries, necessitated by lack of insurance cover, scarcity of savings, and higher poverty levels. Assistance may take the form of a grant or a soft loan, and may vary between a subsidy for a basic core housing unit to a compensation for assets lost, depending on financial considerations. It is vital to ensure that the available funding envelope is optimally utilized to support beneficiaries in proportion with their needs to the greatest extent. Generally, the nature of assistance provided by governments is kept uniform, since reconstruction programs with a mixture of grants and loans require a complex set of eligibility criteria, complicate implementation, and create friction among various social and economic groups.

Globally, the size and nature of housing reconstruction assistance provided has varied. In Gujarat, the government provided subsidies averaging around US$2,000 designed to cover reconstruction of a core unit to minimum standards through an Owner-Driven Approach. In addition, a catastrophe insurance scheme was initiated with initial premiums (lower than US$4) set aside from the reconstruction grants paid out to beneficiaries to provide broad-based insurance coverage to offset future liabilities. In Turkey, on the other hand, the government followed a policy of adequate compensation per a national legislative act, targeted to provide built, high-standard housing

in-situ or at relocated sites, with assistance ranging between US$20,000-25,000. While the Government of Turkey has more recently set up a catastrophe insurance facility for home owners as well as a Seismic Risk Mitigation project urging home owners to invest in retrofitting of housing structures to prevent them from collapsing, results are still incomplete, though comparable to those in Japan and California. This may be explained by a lack of incentives for home owners to make sizable insurance payments, or retrofitting/reinforcing their houses. Finally, in the case of housing reconstruction after Typhoon Franck in Iloilo, Philippines, reconstruction was financed almost entirely by community savings and coordinated by community networks. The ex-ante pooling of savings by an economically disadvantaged yet integrated and adequately mobilized community enabled it to undertake reconstruction with minimal support from the government.

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IT INNOVATIONS:

RECONSTRUCTION 2.0

by Keiko Saito, Guido Lemoine, France Lamy, Luca Dell'Oro, Daniel Brown, Robert Soden, Stuart Gill, Francis Ghesquiere, and Emma Phillips

ABSTRACT

The objective of this paper is to share recent experiences of IT innovation in post-disaster situations, focusing on damage assessments, reconstruction planning, and monitoring the reconstruction process. The paper will serve as an entry point to open up discussions among the various reconstruction stakeholders, as well as the technology experts on the topic of where and how such innovation can assist in reconstruction. The paper aims to inform the discussion by providing practical examples of the innovative use of Information and Communication Technologies (ICT) at each stage of the reconstruction process. It closes by suggesting future directions to help mainstream ICT innovation in reconstruction.

1. INNOVATIONS IN DAMAGE ASSESSMENT

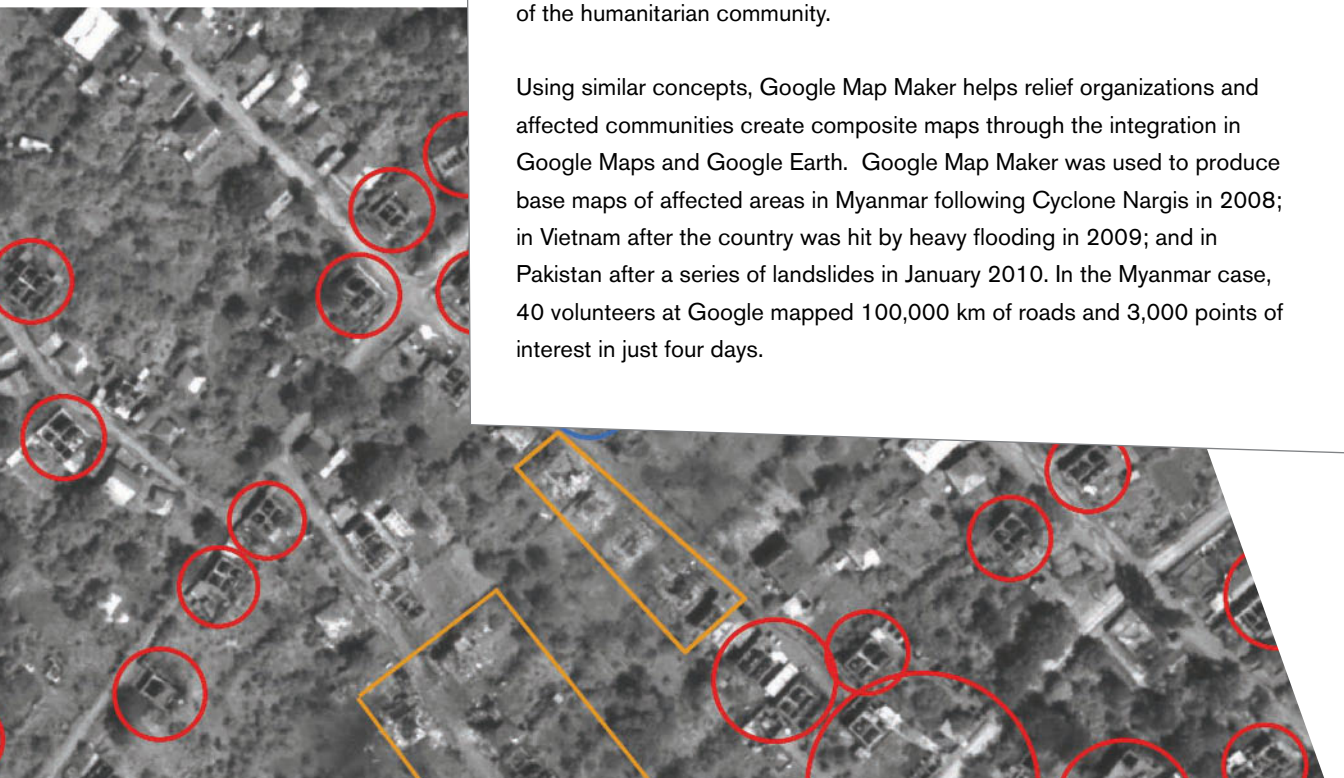
In times of disaster, relief and early recovery activities are carried out in dynamic conditions in which multiple groups often interact on an ad-hoc basis. First responders need to quickly build a picture of the location, condition, and needs of the affected population to target their efforts and mobilize equipment, personnel, and supply. Information on affected communities and infrastructure damage is also key to start planning the reconstruction. Lack of base information and changing conditions often lead to duplicative or conflictive efforts. Recent initiatives relying on crowdsourcing and remote sensing techniques have helped alleviate some of these difficulties by providing rapid mapping of damaged areas and affected communities.

Crowdsourcing Geospatial Information

Mapping platforms such as OpenStreetMap (OSM) and Google Map Maker are examples of collaborative platforms that allow members of the community to create their own maps using data from portable GPS devices, aerial photography, or even from local knowledge.

The original impetus for OSM was that data from the UK Ordnance Survey was costly and came with restrictions on use. Citizens started collecting data through surveys with GPS units. Similar to the Wikipedia framework, OSM allows anyone to edit the map and add or edit information such as roads, businesses, parks, schools, and more, empowering people to share their local knowledge and expertise. The Humanitarian OpenStreetMap Team (HOT) produces data for humanitarian response and economic development purposes. The group started as an informal collaboration between interested individuals and evolved into an incorporated organization in August 2010 that is now active in over a dozen countries. Ongoing projects undertaken by the community include mapping for disaster risk reduction, emergency mapping following a disaster, and custom software development to support the needs of the humanitarian community.

Using similar concepts, Google Map Maker helps relief organizations and affected communities create composite maps through the integration in Google Maps and Google Earth. Google Map Maker was used to produce base maps of affected areas in Myanmar following Cyclone Nargis in 2008; in Vietnam after the country was hit by heavy flooding in 2009; and in Pakistan after a series of landslides in January 2010. In the Myanmar case, 40 volunteers at Google mapped 100,000 km of roads and 3,000 points of interest in just four days.

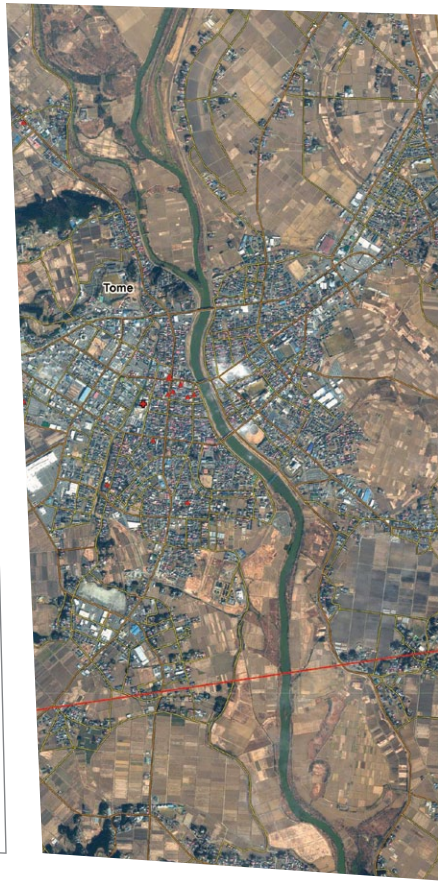


Remote Sensing and Damage Assessments

Remotely sensed images are increasingly being used to assess damage following adverse natural events, particularly in areas that are difficult to access. The use of remote sensing was originally limited to providing an independent validation of ground-collected damage data. Over time, techniques have developed to conduct rapid detailed assessments of damaged infrastructure and affected populations. The 2005 Pakistan earthquake was one of the first disasters where satellite imagery was used to assess specific damage to buildings in disaster-affected regions. The 2010 Haiti earthquake damage assessment marked a milestone in terms of the scale of analysis that was carried out, and the speed at which the assessment was conducted.

Haiti: A 21st Century Damage Assessment

The Global Earth Observation - Catastrophe Assessment Network (GEO-CAN) was formed at the onset of the Haiti crisis to respond to the challenge of mapping post-disaster damage. Supported by the World Bank's Global Facility for Disaster Reduction and Recovery (GFDRR), GEO-CAN is a Volunteer Technical Community (VTC), through which individual experts contribute their time to analyze small assigned segments of remotely sensed imagery to provide a detailed damage assessment. Within a week, GEO-CAN quickly grew to over 600 volunteers representing 131 private and academic institutions in 23 different countries. A number of organizations participated in forming the community, each with their own established expertise in engineering or remote sensing, including the Earthquake Engineering Research Institute (EERI), the UK-based Earthquake Engineering Field Investigation Team (EEFIT), MCEER (formerly the Multidisciplinary and the National Center for Earthquake Engineering Research) and LESAM (Landscape-based Environmental System Analysis & Modeling) at the State University of New York at Buffalo, Georgia Tech University, Cambridge University (UK), the University College London (UK), and Rochester Institute of Technology (RIT).



Haiti: A 21st Century Damage Assessment (continued)

In just three weeks, GEO-CAN managed to produce a building-by-building assessment of the damage caused by the earthquake in the greater Port-au Prince area by visually comparing post-event imagery with pre-event satellite imagery. The damage assessment identified collapsed and heavily damaged buildings (Grades 4 and 5, EMS-98) in Port-au-Prince, Carrefour, Delmas, Léogâne, Jacmel, Grand Goave, and Petit Goave. The results from the satellite/aerial imagery interpretation were independently verified using field ground surveys and remote surveys by organizations including UNITAR's Operational Satellite Applications Program (UNOSAT), The European Commission Joint Research Center (JRC), the Centre National d'Information Géo-Spatial (CNIGS) representing the government of Haiti, and other teams including Cambridge Architectural Research Ltd. (UK), Stanford University, and Betero-Fierro-Perry, Inc.

The global response to the Haiti earthquake was remarkable in many ways. Within days, the most recently collected satellite and aerial imagery was publicly available through Google, Yahoo!, and Bing searches and by the end of January, anyone could access up to half a dozen post-event images for any one area around greater Port-au-Prince. Data from different missions, including the World Bank-ImageCat-RIT Remote Sensing Mission (15 cm optical and 2 points per m2 LiDAR), Google (15 cm optical), NOAA (25 cm optical), Pictometry, and satellite imagery from GeoEye and Digitalglobe, allowed damage from the Haiti earthquake to be viewed through multiple sensors and at different times.

The Haiti experience resulted in a unique and unprecedented partnership between UNOSAT, the JRC, and the World Bank to support future damage assessment using remote sensing techniques.

2010 Pakistan Floods Remote Damage and Needs Assessment

The Pakistan floods of summer 2010 lasted for more than three months, causing damage in almost every province of the country. Heavy rains in the Northwest of Pakistan caused many flash floods in the area, with the massive inundation moving southwards and affecting a third of the country. The geographical extent, as well as the inundation extent, made the event exceptional.

Pakistan is particularly prone to adverse natural events, including earthquakes, landslides, and floods (especially during monsoon season). The World Bank together with the Asian Development Bank, under the auspices of the Pakistan Government, had successfully collaborated in two previous disaster events (the 2005 Pakistan earthquake and the 2007 Monsoon) to produce detailed damage and post-disaster needs assessments. In both events, the Space and Upper Atmosphere Research Commission (SUPARCO) provided support to map the extent of the damage using satellite imagery. Given the magnitude and geographical extent of the 2010 floods, satellite images were again employed to provide estimates of the extent of the disaster.

The 2010 flood was the first event where the joint assessment protocol, the Collaborative Satellite Assessment (CoSA), was activated to produce the damage assessment procedure using remote sensing. CoSA is a collaboration between the remote sensing teams of the JRC, UNOSAT, and the World Bank's Global Facility for Disaster Reduction and Recovery (GFDRR) Labs team.

Moderate Resolution Imaging Spectroradiometer (MODIS) images with 250m spatial resolution were first used to delineate the extent of inundation on a daily basis. Taking advantage of SUPARCO's receiving station for the French optical satellite in Islamabad, SPOT-4 and 5 images were subsequently used to map the inundation extent on a daily basis for the three months that the inundation continued until mid-October 2010. The use of optical images meant that cloud cover was sometimes an obstacle in providing complete mapping. These were used to create a maximum inundation extent map, which was subsequently used to guide more detailed on-the-ground assessments and to analyze the flood impact on four sectors: housing, agriculture, transportation, and irrigation. The data also helped validate the order of magnitude of the field-collected damage estimates reported by the affected provincial governments.

2. RECONSTRUCTION PLANNING

Every disaster is different. As a result, reconstruction planning is usually done on an ad-hoc basis, taking into account local factors such as the resources available; socio-economic and political conditions; and culture and the environment. In recent years, attempts have been made to develop flexible tools to support authorities and relief organizations to better understand the environment in which they work and coordinate interventions. This section presents areas in which ICT has been used to support and plan reconstruction programs.

Volunteer Technology Communities (VTCs)

Platforms such as OSM can provide critical information such as mapping of affected areas and displaced people. In Haiti, the HOT team with the support of the European Commission for Humanitarian Aid and Civil Protection (ECHO), the World Bank, and the International Organization for Migration (IOM) trained over 400 people from diverse backgrounds in data collection and utilization. The information generated by HOT is being used by a number of organizations, including the IOM in a variety of ways. For example, the road network information is being used to (i) register over a million internally displaced persons (IDPs) within Haiti; (ii) map cholera treatment facilities and other water and sanitation infrastructure to help coordinate cholera response; and (iii) survey emergency shelters in the run-up to the rainy and hurricane seasons.

Promoting Open Data

A major challenge in development programs and reconstruction programs in particular, is lack of access to, and sharing of, data. Each year, countless projects are launched that repeat and duplicate data collection efforts, analysis, and use. As a result, various efforts have been launched in recent years to try to open data sources and promote data sharing. Technologies are now emerging that greatly help the compilation and open dissemination of data by addressing the challenges of storing and serving geospatial information.

The implementation of an open data policy has many advantages. It provides the full spectrum of decision makers, whether in the public or the private sector, with information which they can use to make better individual decisions throughout the relief and reconstruction period. It also allows for better decisions to be made by providing increased cohesion among stakeholders, leaving fewer opportunities during reconstruction for gaps, conflicts, and redundancy.

Additionally, open data helps save time and can help accelerate the relief and recovery processes. Securing data from the various organizations can be a laborious and expensive process, often with the duplication of purchasing data. Open data means fewer valuable resources (i.e., time and money) will be wasted securing data with which to make decisions. Without open data, information sets crucial to reconstruction often remain locked in national governments (e.g., various ministries, departments); regional and local governments (councils, municipalities); local communities; private enterprises; and international actors (UN, NGOs).

Open data means fewer valuable resources will be wasted securing data with which to make decisions.

Baseline data is also crucial for damage assessments and reconstruction planning. An open data policy is therefore best started before a disaster event. One approach promoted by the World Bank is to integrate an open data management strategy into the ex-ante risk assessment processes, which should be built into mitigation programs in the reconstruction phase of disaster response.

Closed data, very much like those who maintain it, is at risk during a disaster event and often will disappear forever when most needed. Open data is more resilient to disasters because it can be more easily moved outside of a disaster-affected area, or indeed will already exist there.

3. MONITORING RECOVERY AND RECONSTRUCTION

Following the Indian Ocean Tsunami in 2004, the impacted countries came together to develop a tracking system to monitor the reconstruction process in order to ensure accountability. The Tsunami Recovery Impact Assessment and Monitoring System (TRIAMS) created a comprehensive framework to

monitor reconstruction through four categories of indicators: vital needs, basic social services, infrastructure, and livelihoods. Within each of these sectors, indicators were defined and outcomes measured. An innovative project that aimed to monitor and evaluate long-term reconstruction was piloted, using Thailand and Pakistan as case study sites.

Monitoring Recovery after the 2004 Indian Ocean Tsunami (Thailand) and 2005 Pakistan Earthquake Using Remote Sensing

Remote sensing is also currently being used in an innovative way in the field of monitoring and evaluating recovery after natural disasters. The ReBuilDD group, which consists of researchers based at the University of Cambridge, Department of Architecture (UK), ImageCat Ltd. (UK), and Cambridge Architectural Research Ltd. (UK), has been focusing on developing methodologies for monitoring and evaluating recovery after natural disasters using two case study sites: Ban Nam Khem, a fishing village on the west coast of Thailand following the 2004 Indian Ocean Tsunami; and Chella Bandi in Muzzafrabad, Pakistan, following the 2005 earthquake.

The aim of the research was first to develop a standardized set of indicators that can be used to monitor and evaluate recovery using remotely sensed data. For some indicators, a combination of the use of other datasets, such as secondary data or direct observation data collection methods (such as key informant surveys or video capturing), with remote sensing was considered. The key aspect of the project was to address the cost-effectiveness of using one or a combination of the three data collection methods.

A user survey was carried out at the onset of the project to identify the data requirements of the end users for monitoring reconstruction. Experts from 17 organizations including international organizations, NGOs, and international donors responded to the survey. Existing frameworks of monitoring recovery were also consulted; examples included the TRIAMS indicators, as well as the Sphere guidelines and the Millennium Development Goals. Guided by these existing international frameworks, as well as the external steering

committee members, a total of 13 indicators were defined and categorized in terms of ease of data collection using remotely sensed data. The data collection and analysis methodologies for the indicators, resources, and technical skills required, as well as best practice notes have been provided in the technical report, "Disaster Recovery Indicators."[1] The ReBuilDD team is currently operationalizing the monitoring process with further funding from the Engineering and Physical Sciences Research Council (EPSRC), UK.

Transparency and Monitoring of Resource Allocation

"Tracking the Money,"[2] a recent publication from UNISDR and the GFDRR, provides an overview of the innovative use of web platforms to track the flow of aid after disasters. It compares five different financial tracking systems in terms of their advantages and disadvantages. It also discusses the challenges that these aid-tracking systems face, including the lack of a standardized and tested methodology; difficulty in data quality control; and interpreting the outputs to make the data useful for the decision makers, amongst other issues.

One of the financial tracking systems showcased is the Development Assistance Database (DAD).[3] The DAD is a web-based aid management system that has been implemented in more than 30 countries. Developed and maintained by Synergy Inc., in close cooperation with the UN Development Program (UNDP), it allows for information collection, tracking, analysis, planning, and monitoring of aid given for recovery and reconstruction projects.[4]

The degree of success in the implementation of the DAD varies from case to case. The web-based interface enables the public to gain access to the information on aid flow, which helps increase the transparency of the resource allocation.

[1] http://www.carltd.com/downloads.htm.
[2] Agustina, C. D., "Tracking the Money – International Experience with Financial Information Systems and Databases for Reconstruction," UNISDR and the World Bank (2008).
[3] As of February 2011.
[4] Agustina (2008).

Monitoring of Reconstruction of Infrastructure in Lebanon

Systems like DAD are geared towards the tracking of aid flow at a macro-economic level, for instance, to monitor international donor activities by economic sector or sub-national administrative unit (region, provinces) and help steer complementary international and national reconstruction efforts. The system does not identify individual beneficiaries, or localize sponsored project activities, which carries the risk of multiple financing, duplication of efforts, and under-financing of identified needs at the local level.

Following the 2006 armed conflict in South Lebanon, the European Union's Directorate – General Europe Aid Development Cooperation (AIDCO) – tasked the Joint Research Centre (JRC) to prototype an ICT solution for the tracking of individual infrastructure projects, which the EU financed as part of the overall reconstruction effort managed by the Council for the Reconstruction and Development of Lebanon. The project was developed as a geospatial extension that was synchronized with the alpha-numerical project registration system, which was maintained by a third party.

For each project, the full history of project implementation was made accessible as geo-tagged project information, starting from the project's blueprint and documented, over time, with GPS-tagged field photographs of the subsequent project phases. The system includes a simple web mapping interface, allowing users to upload information and zoom into the level of individual project locations, at which the project chronology can be reviewed in a photo-gallery (see Figure 1). Collection of projects can easily be mapped by sector or type, and then compared to updated satellite imagery to monitor overall progress in reconstruction.

The system is built with open-source software components and particularly well tailored to physical infrastructure projects (buildings, roads, waterworks, etc.). Geo-tagging functionality is provided as uploads of time-stamped GPS-tagged photography or digitization against high-resolution image maps. The various components easily tie into other functional components (e.g., financial tracking systems) that are either proprietary or open-source solutions. Interfaces can be designed to address particular audiences, including communities that benefit directly from the reconstruction efforts. Although this system was developed for post-conflict aid tracking, similar systems can easily be adapted for post-disaster aid tracking.

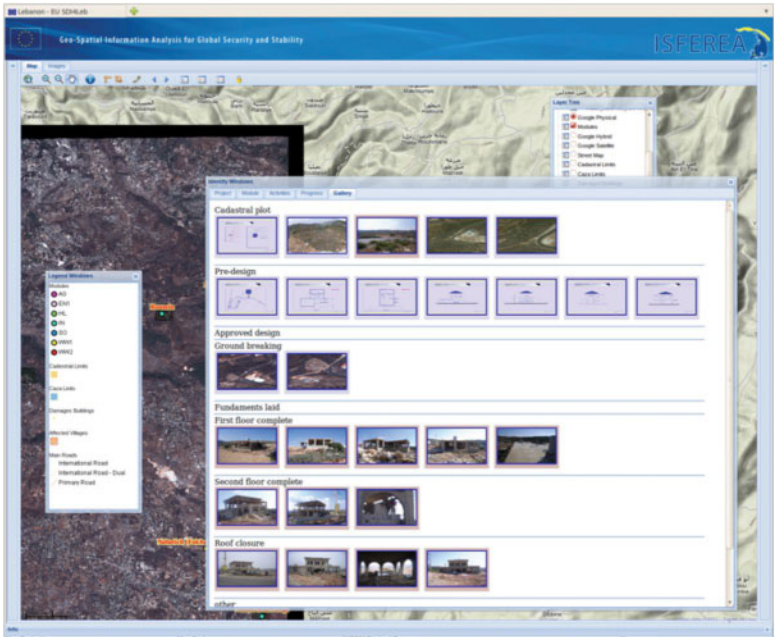


Figure 1. The reconstruction monitoring system (SDI4LEB) uses open-source web mapping interfaces to display project-related information. The pop-up window shows an overview of the project status information for the EU-funded construction of a Roumin municipality administration building. Digital documents and GPS-tagged ground photography for relevant building stages are shown as thumbnails. In the background, recent satellite coverage of the area is displayed.

Innovation in Communication Tools: Monitoring for Transparency

Innovative communication platforms have the potential to monitor the reconstruction process in order to promote transparency. Ushahidi - an open-source software for information collection, visualization, and interactive mapping - is one of these tools. Ushahidi means "testimony" in Swahili. It was launched during the post-election violence in Kenya in January 2008. The platform integrates information collected by email, voicemail, SMS, Twitter, web forms, YouTube, Flickr, Facebook, Skype, and other social media. The

purpose of the Ushahidi platform is to democratize live mapping by creating a live map of needs.

The Ushahidi platform is used by professional organizations and volunteer networks around the world to create more transparency and accountability across multiple sectors. Since its launch, Ushahidi has been used in over 30 countries, for uses including (i) community mapping of social services in slums; (ii) documenting armed conflict; (iii) monitoring election fraud; (iv) assessing the impact of major environmental disasters; and (v) tracking crime in metropolitan areas.

"Help Map" – Wildfires in Russia, Summer 2010

During the Russian wildfires, an Ushahidi platform was launched by Russian VTCs to help coordinate information, assistance, and provide prompt help to the victims of the wildfires. The main purpose of the "Help Map" was not just to map the wildfires, but to build a bridge between those who needed help and those able to help them. The site provided real-time information on coverage and intensity of the fires; requests for assistance (transport, lodging, food, help, etc.), and offers of assistance. Citizens used the internet, mobile phones, or SMS to provide information, and moderators categorized the information and put it online, visualized in maps.

The development of the "Help Map" on an Ushahidi platform is one of the first examples of crowdsourcing in Russia: the site was spontaneously created by various IT networks after a large volume of information about the wildfires started to stream in online from civil society. A "situation room" was also set up in Moscow that coordinated and delivered aid, based on the information that the "Help Map" received and accumulated. As such, the platform went beyond identification and monitoring of the fires to providing a system that allowed volunteers to self-coordinate. One of challenges that remain, however, is ensuring coordination among the VTCs and the local response authorities, and mainstreaming this process.

4. CHALLENGES

Relief, recovery, and reconstruction are dynamic, multidimensional processes that involve many stakeholders. Rapidly emerging technology is likely to change the way DRM practitioners are responding to damage assessment, reconstruction planning, and monitoring of reconstruction processes.

Central to these innovations is the application of remote sensing techniques: although the technology has existed for decades, the application of remote sensing to disaster recovery and reconstruction is still in its early days. Technology is now emerging that allows for faster capturing and analysis of satellite images. Systems are also being established to share information using open data standards and protocols.

New concepts such as crowdsourcing are providing innovative ways of responding to recovery and reconstruction challenges by leveraging the work of the larger community. Indeed, 2010 redefined the role of VTCs in disaster response and recovery. These volunteer experts are most often technical professionals with expertise in geographic information systems, database management, social media, and/or online campaigns. Working inside communities like OSM, the GEO-CAN, and Ushahidi, thousands of technologists responded to disasters in Haiti, Chile, Pakistan, Russia, New Zealand, and Japan.

Data collection and analysis, traditionally the domain of official channels, is rapidly opening up to harvest the contributions of VTCs and the very survivors of the disaster themselves. These new tools and approaches will ultimately redefine the way in which response and reconstruction are carried out. The main challenge that the reconstruction community faces is mainstreaming and integrating innovation into the operational methodologies. This mainstreaming has just begun; legal frameworks must be put in place that allow the two worlds to "co-exist." Hardware and software infrastructure that allows the technology to function needs to be put in place. A communication channel also needs to be established between the stakeholders.

New concepts such as crowdsourcing are providing innovative ways of responding to recovery and reconstruction challenges by leveraging the work of the larger community.

For this to become possible, technologists need to better understand the needs of the practitioners on the ground, and practitioners, in turn, need to understand the potential and limitations of innovative technologies. In short, there is a need for closer collaboration between technology experts and DRM practitioners.

Some Recommendations and Future Directions

- **Promoting Collaboration between DRM and ICT Experts:** The key to the continued development and success of employing innovation in the reconstruction process will lie in whether the technology experts and the DRM practitioners can collaborate. Technology experts must ensure that the systems developed produce the outputs or data that are useful and usable to the practitioners. Patience and persistence will also be required on both sides as the various technologies mature and are mainstreamed. Quality control procedures, as well as setting up legal frameworks for the collaboration, could facilitate this process.

- **Promoting Open Data:** Investment in preparedness, both in terms of baseline data and standardization of operational procedures, is likely to pay off in the long run and is an area that requires urgent attention. During reconstruction planning, baseline data, including pre-event data and post-event situation data, is crucial. Therefore, during the implementation of reconstruction, open data can play a valuable role. Public access to data gives citizens and civil society the ability to report on and interpret reconstruction efforts.

- **Building Capacity for the Use of ICT:** A major challenge to the use of innovative ICT is capacity constraints in various contexts. The inability to deploy ICT to its full potential can be caused by constraints such as a lack of technical skills; limited resources to provide training in a time-restricted environment; poor communications infrastructure; and governance and transparency issues. Capacity building in the regions is therefore necessary to overcome these challenges.

FROM ASSESSMENT TO RECOVERY

AND RECONSTRUCTION PLANNING – CLOSING THE LOOP

by Prashant Singh and Sajid Anwar

1. INTRODUCTION

1.1 What is a PDNA?[1]

The Post-Disaster Needs Assessment (PDNA) is the global standard that country governments and their international development partners undertake as a government-led process that assesses the damages and losses, and synthesizes the needs for recovery, reconstruction, and risk management after a natural disaster. Two complementary methodologies work in tandem to produce the PDNA: the **Damage and Loss Assessment** (DaLA) methodology,[2] which analyzes the damages caused by the disaster and the economic losses (in terms of reduced flows of goods, services, productivity, income, etc. due to the damages and otherwise) to derive a quantitative estimation of the aggregate damages and losses caused by a disaster, and the **Human Recovery Needs Assessment** (HRNA) methodologies being developed and practiced by the UN agencies as a qualitative tool focusing on the human development and social impacts of the disaster by bringing in the affected communities' perspectives.

[1] PDNA is used in this paper as a generic expression to refer to all post-disaster damage and loss assessments that followed an internationally recognized methodology.
[2] Initially developed by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) and since refined and improved by the World Bank/GFDRR.

The PDNA draws institutional validity from the **Joint Declaration on Post-Crisis Assessments and Recovery Planning**[3] to harmonize and coordinate the international post-crisis response framework for assisting country governments battling with post-conflict and post-disaster recovery and reconstruction challenges. A PDNA aggregates damage and loss estimates and crystallizes them into prioritized post-disaster short- and medium-term recovery and reconstruction needs through a policy dialogue between a government and its development partners and captured in the **Recovery Framework**, the final part of the PDNA.

1.2 Outcomes and Capabilities of the PDNA

Empirical evidence shows that the PDNA has yielded tangible results, including leveraging of financial resources, enhanced country ownership and capacity, aid harmonization leading to greater effectiveness, and alignment of external assistance with country priorities. It is able to generate these outcomes predominantly due to the **standardization** it brings to the post-disaster assessment process and its conjoint **ownership** between country governments and their development partners. These bring a **verifiable credibility** to the assessment process. The global methodology also obviates the multiplicity of assessments, since all major stakeholders "own" the evaluation. The collaborative process fosters better understanding and coordination among governments and their development partners for optimizing aid efficiency during the assessment and the recovery phases. The PDNA serves as a converging point for country priorities and external assistance to prevent aid fragmentation and other systemic aid distortions.

The PDNA recognizes and considers damages, losses, and human needs to inform a more holistic recovery and reconstruction needs framework. Earlier, an inordinate (even if unintended) focus on more visible damages may have led to a tendency to underestimate economic losses and human needs that are not as stark as damages. This more recent standardization and holism have the following benefits:

[3] Affirmed by United Nations Development Group, European Commission, and the World Bank in October 2008.

- The PDNA makes the net impact of a disaster available to decision-making levels of government, including disaster risk reduction (DRR) and climate change adaptation measures for sustainable recovery.
- It helps the affected country define and prioritize its recovery and reconstruction plan for the short and medium terms, and helps integrate them with the overall national development strategy.
- It has a significant impact on an affected country's financial leveraging ability, as it is an internationally recognized process. Some countries are able to leverage more recovery assistance than would be possible without a PDNA.[4]
- Standard methodology allows for greater alignment between country priorities and donor preferences.
- It fosters better aid harmonization among the development partners whereby donors can coordinate their respective assistance strategies, financial and technical assistance to felt needs in keeping with their comparative advantages and avoid overlaps and gaps.

This paper begins with a section on how the PDNA has been an effective tool to inform recovery, reconstruction, and risk reduction. The modus of the PDNA informing the recovery and reconstruction process is explored through its impact on the following:

- Policy and institutions
- Country ownership issues
- Challenges of mainstreaming
- Ability to customize the PDNA
- Integration of IT solutions in PDNAs
- Practitioner Opinions, recovery prioritization, recovery and reconstruction phase

The paper will develop into an issues paper to discuss the need for further refinement or enlargement of the scope of the PDNA as an instrument for a more efficient and accelerated post-disaster recovery and reconstruction phase. Rather

[4] Myanmar after 2008's Cyclone Nargis is an example. Due to its minimal exposure to the international donor community, there was insufficient donor interest until the Post-Nargis Joint Assessment (PONJA) was conducted. The Haiti 2010 PDNA served as the base document for the New York Donors' Conference of March 2010. Several PDNAs have led to additional IDA resources, e.g., Samoa, Central African Republic, Bhutan, etc.

than prescribing universal fixes or being doctrinaire about changes to methodology, the purpose of this background paper is to encourage discussion by posing forward-looking questions. It is dispassionate in capturing the strengths and weaknesses of the PDNA process as well as potential areas for improvement.

In short, this paper is developed with the following broad questions in mind: How does the PDNA inform the recovery and reconstruction framework and the implementation arrangements? Is there room for improvement? And, if yes, what are some of the elements of improvement?

2. ASSESSING THE IMPACT OF PDNAS

The PDNA process, being owned and led by the country government, has a positive impact on the recovery framework and implementation arrangements for the in-country delivery of post-disaster recovery, preparedness, and DRR mainstreaming. This section explores how a PDNA impacts country internalization of DRR policies and institutions, and discusses the mechanisms used to finance recovery and reconstruction. It then examines the impact of country ownership on in-country capacity for disaster response preparedness and on the recovery and reconstruction. It concludes with a discussion on mainstreaming DRR into national development agendas with a focus on the challenges of mainstreaming. The questions presented are a starting point for a discussion on further evolution of the assessment process.

2.1 Importance of Preparedness

Policy and Institutions

The PDNA has proven efficacy as a tool to trigger and seed DRR initiatives and policies in countries. For example, the government-led PDNA in Indonesia after the 2009 West Sumatra earthquakes recommended DRR measures for specific sectors, including education, health, infrastructure, governance, environment, and sustainable livelihoods. It also influenced policy directions within the country: it found that 60-80% of the damages were in the housing sector, triggering a

move towards stronger building codes and construction standards. In Myanmar, Village Disaster Preparedness Committees were constituted to strengthen local-level capacity after the Post-Nargis Joint Assessment (PONJA). In 2009, the Lao PDR PDNA convinced the highest levels of government to start enforcing the Strategic Plan on Disaster Management that the country adopted in 2003. It also led to moving and strengthening Lao's National Disaster Management Committee to the influential Ministry of Planning and Investment.

The manner in which PDNAs stimulate policy and institutional reforms in country governments is not sufficiently documented. There is no method to establish causation or correlation between a PDNA and subsequent DRR policy implementation or institutionalization. There is also no tool to determine whether DRR policies are sustained over the long-term as the impacts of a disaster are addressed and the momentum for reform dissipates. For instance, activity levels in the Village Disaster Preparedness Committees in Myanmar are reportedly decreasing, as there have been no disasters after Nargis. Sustaining the kick-starting of DRR policy and institutional impact of PDNAs would require continued commitment from government and community for building resilience into national development strategies, as well as adequacy of financial and fiscal space for making the right investments.

PDNAs have the ability to help in developing or identifying the correct post-disaster financing mechanisms for a country.

Financing Mechanisms

Disaster preparedness is also determined by the available financing mechanisms. An affected country will have easier access to immediate liquidity after a disaster if it chooses appropriate financing mechanisms. PDNAs have the ability to help in developing or identifying the correct post-disaster financing mechanisms for a country.

Reallocation of domestic outlays is one of the first financing mechanisms countries employ to deal with the challenge of post-disaster recovery. The PDNA after the 2009 Samoan tsunami had a marked effect on the country's budget: after it recommended a review of the size and appropriations of its unforeseen needs fund, the Samoan government conducted a mid-year budget review and incorporated recovery and reconstruction needs at 3% of the total budget.

Raising new and additional domestic resources through bonds, taxation (direct or indirect), or a levy is another typical financing mechanism available to post-disaster countries, although these depend on the macroeconomic framework of the country and are meaningful only in developing countries or emerging economies and not in least developed country contexts.

National or multi-donor trust funds are another financing mechanism for post-disaster recovery financing. After the 2008 tropical storm in Yemen, a joint assessment[5] recommended a recovery and reconstruction fund for the efficient coordination of recovery and reconstruction efforts. As a result, the Yemeni Government established the Recovery and Reconstruction Fund (RRF), which is channeling about US$70 million per year to disaster-affected areas. Though the fund is restorative rather than preventative in nature, it does increase Yemen's capacity to respond to natural disasters.[6]

Risk-pooling is an efficient financing mechanism in scenarios where the establishment of dedicated funds is not a feasible financial proposition. It is an effective alternate financing mechanism that enhances disaster response preparedness and finances post-disaster reconstruction and recovery. The Caribbean Catastrophe Risk Insurance Facility (CCRIF), the first multi-country risk pool, is an example. Small island states cannot access most catastrophe insurance products due to high transaction costs. Due to high debt levels, some of these are also hamstrung by a limited access to development credit. By pooling multiple countries' risks, CCRIF provides affordable yet effective coverage against natural disasters. The immediate access to finance gives affected countries the fiscal room and time to conduct a PDNA and leverage finances for longer-term recovery and reconstruction. Haiti received US$7.7 million from CCRIF within two weeks of the 2010 earthquake, and had paid a premium of only US$385,000. Established in 2007 by CARICOM and the World Bank, the Caribbean-owned CCRIF has 17 member states and has made seven pay-outs to date.[7] The feasibility of a similar risk pool is currently being examined for Africa to limit the impact of chronic droughts in the region.

[5] Yemeni Government, World Bank, UNISDR, and International Federation of Red Cross and Red Crescent Societies.
[6] GFDRR, Disaster Risk Management Programs for Priority Countries (World Bank, 2009).
[7] World Bank , "A Review of CCRIF's Operation After its First Year," Knowledge and Learning Team, Development Effectiveness Unit, Latin American and the Caribbean Region (Washington, DC, 2009).

Financing mechanisms are a necessary but not sufficient pre-requisite for effective post-disaster recovery and reconstruction. Even with proper financing mechanisms, if a country does not have the governance and institutional structure for due delivery in a timely and equitable manner, the goal of recovery would be elusive. Moreover, if the institutions managing post-disaster recovery do not have the absorptive capacity, recovery and reconstruction would suffer even in spite of available finances.

Since the suitability of different financing mechanisms depends on country variables such as national income, domestic savings, debt-to-GDP and tax-to-GDP ratios, and frequency and severity of disasters, what can a PDNA do to evaluate current financing mechanisms or to recommend institutional measures to ensure timely and orderly recovery and reconstruction? Should assessing institutional and absorptive capacities of governments be within the scope of a PDNA? Otherwise, how can it be determined that any recommended financing mechanisms will not be rendered ineffective due to inadequate absorptive capacity? Given these unknowns:

- Can the scope of the PDNA be enlarged to include an assessment of the policy and institutional frameworks and absorptive capacities of national and provincial governments?
- How can a PDNA help countries determine the most effective financing mechanisms for recovery and reconstruction?
- How can the PDNA process better assist the identification, creation, or strengthening of appropriate financing mechanisms?

2.2 Country Ownership of the PDNA Process

The PDNA provides the country government its short-, medium-, and long-term recovery and reconstruction framework, which includes components for mainstreaming DRR into its policies and institutions. Country ownership is crucial as the main purpose of a PDNA is to sensitize the government on the disaster damage, losses, and needs, enhance its awareness of the need for DRR and climate change adaptation for prevention, strengthen its capacity for response preparedness and prevention, and assist accelerated recovery. It is

evident from previous PDNAs that sufficient country ownership is crucial for achieving the desired results of the process:

- It helps shift the focus from disaster response to disaster risk reduction and prevention.
- It sensitizes the government on the importance of DRR, rationale for adopting DRR policies, and for bolstering or enforcing extant DRR policies.
- It assists in defining the roles of different agencies and institutions in-country for future disaster responses.
- It makes it easier for international development partners to align with a country's recovery and reconstruction goals and harmonize their response.

By many practitioner accounts, the PDNA *process* rather than the methodology has a profound influence on the recovery and reconstruction framework and its subsequent implementation. (This is not to contend that the process is more important than the methodology, or vice versa). The PDNA exercise has the ability to convene all relevant government agencies and entities at the decision-making level. The scope of the methodology, in terms of sectoral assessments and final aggregation, has a direct impact on the recovery and reconstruction framework; however, it is country ownership in assessing the disaster impact and needs that determines the scope of the framework, the prioritization of needs, and the efficiency of implementation.

At present, there is no standardized sectoral assessment of a country's DRR framework as part of the PDNA methodology. If the damages and losses from a particular disaster are found to have been largely caused due to insufficient DRR mainstreaming, would it be prudent to have the PDNA focus on assessing the strengths and weaknesses of the country's DRR policies and institutions in addition to the conventional methodological application of PDNA to the disaster? Would a greater focus during the PDNA exercise actually translate into greater uptake of DRR policies during the recovery and reconstruction phase due to adequate sensitization of the competent levels of governments with the need and justification for DRR mainstreaming?

Country ownership of the PDNA process, which leads to ownership of the DRR agenda, is the ideal scenario. However, in some countries, insufficient capacity or moderate intensity of disaster may lead to a government preference for a "lighter"-than-PDNA assessment or for "rapid" assessment within a given timeframe in order to leverage it for recovery and reconstruction finance. These scenarios, in which urgent recovery and reconstruction overwhelms DRR considerations, signify limited country ownership of the DRR agenda. Thus, how can country ownership be ensured so that the true value of DRR is recognized, especially in countries that are at risk but may lack the capacity to sustain the commitment? Some questions that would help a fruitful discussion on this subject would be:

- Can access to concessional funding be predicated upon a country's ownership of DRR? If not, how can the perverse incentive of not investing in prevention be contained?
- Should the DRR advocacy be targeted only at the government? Or should it be enlarged to the extra-governmental audience through the civil society and the educational spectrum?
- How can PDNAs ensure that DRR is duly mainstreamed into investment guidelines?
- Should PDNA recommendations include capacity building for at-risk countries with low institutional capacity? Can such initiatives be integrated into the recovery and reconstruction framework as a core component?

2.3 Absorptive Capacity Concerns

Different disaster-affected regions within the country often have varying absorptive capacities to manage the fragmented aid flows. This calls for a sensitive approach by international development partners on the need for harmonizing aid for maximum development effectiveness and minimum financial and non-financial transaction cost on the already-stretched capacities of the federal and provincial governments. A goal of all PDNAs, encapsulated in the recovery and reconstruction framework, is to strengthen country

capacity in terms of its DRR framework. The challenge is to manage it while ensuring transparency, adequacy, and equity in a country that has uneven absorptive capacities in various disaster-affected areas.

Capacity strengthening of sub-national levels of government could be achieved by involving them in the PDNA process, providing them exposure to standard, internationally recognized methods of assessing damages, losses, and needs. But this can go only so far. Much more would need to be done in order to build provincial and local capacity to the point where they can lead their own PDNAs, leverage the strength of their communities, and manage large, additional, and fragmented domestic and external post-disaster development finance that must be managed in addition to normal development outlays. The questions that emerge from this double whammy of reconciling the normal development processes and the additional post-disaster priorities are as follows:

- Does the recipient country have enough capacity to properly distribute and efficiently utilize available recovery financing alongside normal development commitments?
- Should national and sub-national absorptive capacity assessment be a part of the PDNA?
- How can the PDNA help build provincial and local capacity? How can this be accomplished without disturbing the statutory balance between the federal and the provincial structures?

2.4 Challenges of Mainstreaming DRR

PDNAs' recovery and reconstruction framework recommendations have often promoted better mainstreaming of DRR strategies into national development and growth strategies. In cooperation with the Bank/GFDRR, the Yemeni Government has developed guidelines to help the country strengthen its DRR capacity. One guideline is that existing institutions will be strengthened and no new institutions will be established. The government also established

the National Disaster Management Unit to focus on disaster response and the Directorate of Environmental Emergencies and Disasters to monitor progress on the Hyogo Framework for Action (HFA).[8]

Mainstreaming DRR is increasingly emphasized in country assistance strategies. Development institutions like the Bank are also paying attention to DRR in their strategies. The World Bank incorporated disaster risk management in its Indonesia Country Assistance Strategy in 2006. It has also identified environmental sustainability and disaster mitigation as one of its five core engagement areas in its recent Country Partnership Strategy.[9]

A PDNA's recovery and reconstruction framework is a detailed plan of what an affected country needs to recover from a disaster. Often, given the urgency of recovery and reconstruction, it overshadows what the country can do to mitigate, if not prevent, future disasters. PDNAs have a section on the DRR framework of the country that reviews the existing DRR framework and suggests improvements. However, the extent of the DRR review varies from one PDNA to another. In GFDRR-supported DRR strengthening projects, the PDNA is used as a base document for the design of further mainstreaming assistance. Therefore:

- Should a review of a country's DRR framework and the recommendations for its strengthening and improvement become a standardized part of the PDNA?
- If a PDNA identifies concrete steps to strengthen a country's DRR framework, how should they be integrated into needs to ensure they do not get lost in the implementation process?
- Would categorizing specific DRR recommendations into the short- and medium-term recovery strategies help ensure its place in the country's development agenda?

[8] HFA's priorities for 2005-15 are to: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; identify, assess, and monitor disaster risks and enhance early warning; use knowledge, innovation, and education to build a culture of safety and resilience at all levels; reduce underlying risk factors; and strengthen disaster preparedness for effective response at all levels.

[9] World Bank, I*nvesting in Indonesia's Institutions* (World Bank, 2008) and World Bank, GFDRR - *Integrating Disaster Risk Reduction and Climate Adaptation into the Fight against Poverty*(World Bank, 2010).

Some post-disaster assessments include recommendations for strengthening DRR and making it a part of the overall national agenda.[10] Others only contain general advice for the DRR framework.[11] Including a review of the country's DRR framework as a standard, in-depth sectoral assessment during a PDNA may be made a norm. If advice on mainstreaming DRR is to become integral to a PDNA, the following questions arise:

- How can DRR mainstreaming be ensured given that recovery and reconstruction are urgent concerns of governments who may not have sustained political will for it?
- Is basing access to recovery financing on whether or not a country followed PDNA recommendations for DRR mainstreaming a plausible way to ensure implementation?
- How can DRR mainstreaming be encouraged in a country whose overriding concern is to leverage the PDNA for recovery and reconstruction funds?
- How can the PDNA be used to bring about an attitudinal shift in government and society from a reactive approach to a preventive approach to natural disaster response?

3. EVOLVING ROLE OF PDNAS

3.1 Customization of the PDNA and Its Role

A lack of significant variability is a major area for refinement of the PDNA. Currently, PDNAs are not customizable to the scale of a disaster, the stage of development, income level, or governmental capacity of a disaster-hit country. How can a PDNA be customized to these variables while still maintaining the credibility that comes from its standardization? In the case of Senegal's August 2009 floods, the country's capital, Dakar, was most impacted. Thus, the assessment understandably focused more on specific sectors such as housing and urban infrastructure, and less on sectors such as agriculture. Variable focus in

[10] Indonesia, 2009.
[11] Haiti, 2010.

sectoral assessments is an easy decision to make. Customizing a post-disaster assessment on other variables like scale of disaster and the macro-economic situation of the country is a more subtle task.

A customized PDNA could prove to be the most cost- and time-efficient tool for recovery and reconstruction. In order to get the most out of a PDNA, the ways in which it could be calibrated to the intensity of disaster, macro-economic situation, and absorptive capacity of the country must be explored and established. In the quest for guidance on customizing of PDNAs as per country specificities and disaster intensity, some of the questions that arise are as follows:

- How do we approach a PDNA in a low-income country compared to a middle-income or developed country? What should be the respective emphases? The poorest within a country are the most vulnerable and are often the hardest hit by disaster. How do we maintain the focus on the most vulnerable (poor, aged, disabled, women) while customizing post-disaster assessment types by broad criteria as national income, per capita income, or GDP?
- How should a PDNA adjust itself between countries with an established DRR framework and with minimal or no framework? Increased or decreased focus on a sectoral assessment for DRR strengthening is an obvious answer, but there are other questions: What if the country does not show adequate interest in developing DRR policies and institutions? What implications would this have for the country's resilience to future disasters?
- In a fragile, in-conflict, or post-conflict state, how should the PDNA internalize the overall fragility in the recovery framework? Natural disasters have an extreme effect on employment and livelihood – two aggravators of conflict. Can the PDNA, which already addresses these, factor this linkage in the recovery and reconstruction framework? A separate WRC session examines this interrelatedness regarding post-disaster recovery in conflict situations.
- How can a PDNA be calibrated to the scale of the disaster? Would it be possible to have a "lighter" process for small and medium disasters as different from large catastrophes? Better baseline data would move us closer to this calibration, but what else is required?

- How can PDNAs be adapted for recurrent disasters? How does a disaster's recurrent nature impact the recovery framework and its priorities?
- Most hydro-meteorological and geo-morphological disasters have regional causality and do not respect national boundaries. How can a PDNA capture the regional risk dimension and recommend regional interventions for better mitigation and prevention for the future?
- How can we use data, outcomes, and lessons learned from past recovery frameworks to inform efficient, customizable PDNAs in the future?

3.2 Integration of IT Solutions

In order to ensure that a PDNA informs the recovery and reconstruction phase as efficiently and accurately as possible, it must evolve by calling upon cutting-edge technological solutions to validate ground assessments. Technological solutions also have a potential for aid-tracking, transparency, and grievance redressal systems that are essential to post-disaster recovery efforts.

Haiti's 2010 post-earthquake PDNA is an example of successfully commissioning information technology for damage and loss assessment. Conducted a month after the earthquake, the Haiti PDNA used remote sensing technology to carry out a detailed, building-by-building assessment of the damage in the housing sector. The damage assessment employed satellite data from GeoEye and DigitalGlobe, satellite imagery companies. The satellite data, combined with remote sensing images from Google, the National Oceanic and Atmospheric Administration, and Pictometry (an aerial imaging company), allowed an assessment of the damage using multi-dimensional views. This massive amount of data was analyzed using "crowd-sourcing" – the outsourcing of data to a large group of individuals: GEO-CAN,[12] a group of over 600 engineers and scientists, successfully assessed 30,000 severely damaged structures in less than a week. To verify the results, targeted field assessment visits were conducted; engineers conducted a separate analysis using oblique-angled aerial imagery. The data could not have been concatenated in the absence of pre-earthquake satellite images. These pre-disaster images are the type of baseline data that would facilitate "light" and customized assessments for relatively smaller or

[12] Global Earth Observation – Catastrophe Assessment Network.

recurrent disasters. It would also help verify non-PDNA government assessments that did not follow any standardized methodology. Such images should be available for almost all land sites in the world.

Information technology could prove more useful for disasters that allow for early warning. In order to realize the potential of remote sensing for early warning systems, losses at household level must be determined. While a small herd of livestock may have a miniscule impact on the overall damage and loss assessment in macro-economic summation, it is invaluable for human recovery at the household level. For instance, prior to a flood, could one family get itself and a small number of livestock to safety with one to two hours of warning?

IT solutions have started to make their mark in PDNAs and the recovery and reconstruction processes that follow. With much of the technology still being tested in field conditions, their overall utility and cost-effectiveness for PDNAs and recovery remain open questions. However, it is undeniable that information technology has enormous potential to play a larger role in post-disaster assessments going forward. This also envisages a large role for the private sector and civil society in the PDNA and the ensuing recovery phase. To better integrate them as essential tools in PDNAs, the following questions must be addressed:

- How can PDNA practitioners ensure that the use of certain technologies is cost-efficient?
- Since the scale and spread of the disaster would determine the feasibility of a given technological option, should certain technologies only be used for large catastrophes?
- How can data sharing, management, and analysis be used to increase coordination between governments and international development partners?
- How can IT be used to help generate and marshal ex ante baseline data that would allow PDNAs to be customized for the scale of disasters?

3.3 Practitioners' Opinion, Recovery Prioritization, Recovery and Reconstruction Phase

Practitioners' Opinion

PDNAs include long-term recovery priorities but should they include a long-term vision for sustainable development?

At the Global Dialogue on Post-Disaster Recovery and Reconstruction Planning,[13] a group of practitioners identified many of the issues discussed here. Among them, one of the most prominent was the need to go further after the assessment is completed in terms of leveraging development finance, assisting in the implementation of the recovery framework and the transition from the humanitarian to the development phase by concentrating on the "missing middle" – recovery. Some summary upshots of the Global Dialogue are as follows:

- There is a perception that the PDNA does not include all actors in the recovery phase. Even though the government is leading the effort, should all actors be involved?
- PDNA teams should remain engaged with government beyond the PDNA to monitor financing and progress of the implementation of the recovery framework after the assessment.
- PDNAs include long-term recovery priorities, but should they include a long-term vision for sustainable development?
- There are early recovery interventions simultaneous to the PDNA. How can they be integrated into the recovery framework? How does one draw the line between the end point of early recovery and the start line of recovery and reconstruction in the seamless continuum of disaster relief, recovery, and reconstruction?
- PDNAs have helped governments realize that there are longer-term development needs such as statutory and regulatory DRR frameworks. However, they need to go further. How can sustained government ownership be ensured?

[13] Washington, DC, October 2010, organized by GFDRR with European Union and UNDP BCPR.

It is clear that certain aspects of the PDNA can be improved upon. For instance, a PDNA cannot correctly isolate the impact of a specific disaster of any scale in the absence of accurate sectoral baseline data. It is also argued that light PDNAs are tough to carry out: it is difficult to customize a PDNA based on disaster intensity or frequency while maintaining its methodological robustness and statistical integrity.

Some practitioners argue that due recognition of country systems in DRR is not where it should be: international partners assisting a government in a PDNA often adapt the country's existing DRR framework to fit the standardized PDNA. If one of the goals of a PDNA is to increase country ownership and strengthen its DRR framework, should the PDNA be customized to fit the DRR structure already in place or vice versa? A simple response may be that this would take away from the credibility of the post-disaster assessment. But would integrating the strong aspects of a PDNA with the country's existing DRR and response framework serve to build durable capacity, a stated goal of the PDNA?

Prioritization of Needs

Prioritization of post-disaster needs coming out of a PDNA is a sovereign function of the government. On prioritization, the following questions raise themselves:

- Should the PDNA provide a listing of what the needs are for proper recovery and reconstruction as it normally does or should it provide a prioritization of those needs?
- Is prioritization an aspect that is best left to the country alone or does it require external expertise? Is building country capacity for such prioritization one of the goals of PDNAs?

Post-disaster assessments are subject to measurement issues which can impact prioritization of recovery and reconstruction projects. Sometimes damages (to stocks) and losses (of flows) are added together, resulting in double counting.[14] Biases in measurement can also go the other way, leading to underestimates of damages.[15]

The joint 2010 WB/UN report *Natural Hazards, UnNatural Disasters: The Economics of Effective Prevention* raises three points on the subject. First, comprehensive damage assessment of public infrastructure is useful, especially if decisions on repairs and priorities are made centrally. Second, decisions on sequence of repairs and its funding require estimating a disaster's fiscal effects, which is different from estimating property damage. Forecasting tax revenues (to pay for rebuilding) may be the harder task, and even when revenues fall by a small fraction of national output, the fiscal sustainability of many developing countries may be jeopardized. Third, the utility of evaluating damage to private property is questionable. Likewise, the merit of estimating output declines by sector is unclear because of high sectoral interdependence.

The Recovery and Reconstruction Phase

Since recovery and reconstruction are stages of a continuum, it is difficult to punctuate the transition from early to long-term recovery. To develop the tools for demarcating the phases of the continuum, the following issues must be addressed:

- Where does early recovery end and long-term recovery begin?
- Does early recovery stymie long-term recovery and reconstruction? Should early recovery be confined within a timeline in order to give way to long-term recovery?
- If early recovery is to be contained within a finite timeline, how is the timeline determined?

[14] The Post-Disaster Needs Assessment of Haiti estimated damages at 7.75 percent of GDP (or US$476.53 million) and losses at 6.85 percent (US$420.86 million). These two numbers were added and widely reported in The Economist's February 12, 2009 issue ("The storms have cost the country $900 million, or 14.6 percent of GDP, according to a donor-funded government study") and in the World Bank's remarks to the aid consortium on April 14, 2009.

[15] Although the dead are counted, damage estimates ignore the value of lives lost. The destruction of "the commons" is rarely included because they are difficult to value and have no well-defined claimants.

- Since recovery and reconstruction constitute an urgent task separate from conventional development, how can it be ensured that these two processes do not distract each other?[16]
- Finally, is there scope in the PDNA process to begin to consider climate change adaptation measures? Would such measures dovetail well in long-term recovery activities, or perhaps in the reconstruction phase as mitigating measures against the next similar extreme natural event?

Monitoring and Evaluation

A prelude to answering any of these questions is effective monitoring and evaluation of the relief, recovery, and reconstruction phases. While relief is outside the scope of this paper, practitioners have identified insufficient monitoring of the post-PDNA recovery and reconstruction phase as a common shortcoming. Information on post-PDNA recovery activities is sparse and scattered, and not always easy to link to the PDNA's framework, even if it was a direct result of its recommendations. How can the PDNA ensure proper monitoring of the recovery and reconstruction phase? Proper monitoring would not only ensure efficient recovery and reconstruction, but also allow for a "lessons learned" component to be incorporated into the PDNA, thereby increasing the effectiveness of future assessments and overall results on the ground.

4. CONCLUSIONS

PDNAs have repeatedly shown that they are an effective and efficient way to:

- Strengthen country ownership of the assessment and recovery processes;
- Inform the full cost of recovery and thus, the benefits of mainstreaming DRR into the national development agenda for the future;

[16] After the 2009 earthquakes, the Government of Indonesia decided to distribute the required funds for reconstruction over a 5-7-year period. The lack of timely financial support led to houses being reconstructed at sub-par standards as communities were not able to wait 5-7 years to rebuild. This has led the government to consider other risk financing options, as 5-7 years may be an appropriate timeline for an entirely new housing development plan, but not for a reconstruction plan.

- Shift governments from a mindset that is reactive to disasters to one that is preventive;
- Build capacity in the affected country and establish effective DRR frameworks;
- Bring together governments and international development partners for a coordinated assessment process that results in credible, internationally accepted estimates of recovery needs;
- Help a government leverage external recovery financing; and
- Encourage risk management through various risk financing and transfer mechanisms.

Despite the positive impacts of PDNAs, their overall efficacy and how they translate into recovery and reconstruction can be further refined. In its current form, a PDNA:

- Has no mechanism to monitor whether or not reconstruction and recovery are conducted according to the recovery and reconstruction framework;
- Has no mechanism to monitor what DRR policies and institutions are put into place after a disaster as a direct or indirect result of the PDNA;
- Is not customizable to various situations including disaster intensity, country capacity, recurrent disasters, status of existing DRR frameworks, country income, etc.;
- Does not have a mechanism that allows for "lessons learned" to learn from ex post evaluations;
- Does not prioritize sectors, projects, or provide guidelines for integrated planning;
- Does not ensure that disaster recovery mechanisms are not dictated by traditional development guidelines and timeframes; and
- Can do more to help a country leverage funding for mainstreaming DRR into its national development strategies.

5. NEXT STEPS

Through all the benefits and possible refinements of the PDNA tool that have been discussed, the overarching theme is that the lack of follow-up after a PDNA keeps the process from being as effective as it could be in terms of informing post-disaster recovery, reconstruction, and DRR strengthening. Of the questions presented in this paper, those brought up in this section may be the most forward-looking and require introspection on part of the international development community. With answers to these questions, the PDNA process stands to evolve into a much more informative process for post-disaster recovery and reconstruction and for the sustainable implementation of DRR frameworks.

In its current form, the PDNA process provides a credible needs assessment and recovery framework, but there is no tool to determine how the framework translates into the actual recovery process. The biggest roadblock in understanding the linkage is the lack of practitioner involvement after the PDNA is completed. There are ways to ensure that the PDNA directly informs the recovery and reconstruction process, and to ensure that financing and implementation are coordinated, monitored, and tracked for development efficiency. It is expected that the thematic session would generate a fruitful debate and provide guidance on the ways to improve the result orientation of PDNAs.

- What are the constraints in having recovery and reconstruction informed by the PDNA?
- How can international development partners stay involved in the recovery and reconstruction process instead of moving on after the PDNA report is finalized?
- How can a PDNA assist the implementation of its recovery framework through proper translation of needs into project development?
- What is the entire spectrum of benefits that come out of continued involvement through the implementation of the recovery and reconstruction framework?

- Why is translation of the PDNA's recovery framework into actual implementation not always guaranteed?
- What are the resource constraints on ensuring accurate and efficient implementation of the framework?
- In order to ensure that the PDNA directly informs the implementation of the recovery and reconstruction framework, could the agreement between a country and its international partners be front-loaded when a government requests assistance in conducting a PDNA?

Post-disaster needs assessments have proven invaluable in strengthening resilience and informing disaster recovery frameworks in over 20 countries over the last three years alone.[17] The method has proven capabilities for informing recovery and reconstruction frameworks. However, its long-term benefits are yet to be determined and catalogued; there is considerable potential for the refinement and evolution of the process. Affected countries and other stakeholders must closely monitor the process, its outcomes, and how it has translated into results in terms of what has worked and what has not. This would help the PDNA evolve into a more effective tool for promoting sustainable recovery and disaster prevention in high-risk countries and regions. This paper is just a starting point for the discussion that will eventually lead to the strengthening of the tool and more efficient and informed post-disaster recovery and reconstruction processes.

[17] See http://www.gfdrr.org/gfdrr/node/118.

RESPONDING TO NATURAL DISASTERS

IN FRAGILE AND CONFLICT SITUATIONS

by Markus Kostner and Rina Meutia

INTRODUCTION[1]

A natural disaster represents an external shock with a potentially significant impact on a country's economy and environment, a people's livelihoods, a government's fiscal position, and a nation's social fabric. Essential to an effective post-disaster response is not only the prompt availability of financial and technical resources but also determined national leadership, functioning institutional structures and processes, and sufficient local capacities.

Addressing the varied impacts of a natural disaster is challenging enough in stable and prosperous states. And so, responding to a natural disaster is particularly daunting a task in situations where state and societal institutions are weak, states and sub-national governments do not provide protection and access to justice, markets do not provide employment opportunities, and communities have lost the social cohesion that contains conflict—the hallmarks of a state where political and criminal violence flourishes.

Over the past several years, some of the major natural disasters have occurred in fragile and conflict-affected countries, notably the Indian Ocean tsunami in 2004 which seriously affected Indonesia and Sri Lanka, the 2005 earthquake and 2010 floods in Pakistan, Cyclone Nargis in Myanmar in 2008, and the 2008 series of hurricanes and the 2010 earthquake in Haiti. In such situations, the impact of a natural disaster is inevitably more pronounced, and evidence suggests that disasters exacerbate the weaknesses of political, economic, and social systems that are due to prolonged conflict.[2]

[1] The authors are grateful for the advice and support they received from Henriette von Kaltenborn-Stachau from the World Bank's Fragile and Conflict-Affected Countries Group in preparing this paper.

[2] United Nations Development Programme, ***Evaluation of UNDP Contribution to Disaster Prevention and Recovery***, Evaluation Office (2010). See also Keefer, Philip, Eric Neumayer, and Thomas Plümper, "Earthquake Propensity and the Politics of Mortality Prevention," Policy Research Working Paper No. 5182 (World Bank, 2010).

The 2011 World Development Report[3] (WDR) highlights some fundamental differences between fragile and violent situations and stable developing environments. First is the need to restore confidence in collective action before embarking on wider institutional transformation. Second is the priority of transforming institutions that provide citizen security, justice, and jobs. Third is the role of regional and international action to contain external stresses. Fourth is the specialized nature of external support needed.

This paper argues that what is essential for a country to break repeated cycles of violence is equally if not more important for the national and international response to natural disasters in fragile and conflict situations.[4] Taking the WDR as our point of departure, we reflect on its insights from successful transitions and discuss the adequacy of the tools that have been adapted successfully across country contexts. The paper is not intended as an exhaustive treatment of the subject matter. Rather, it aims to stimulate international debate and enhance collective action to improve disaster preparedness and response for when the next disaster strikes.[5]

Specific Post-Disaster Challenges in Fragile and Conflict Situations

There are some significant differences between natural disasters in situations of fragility and violence and those in stable developing environments. To mention but a few:[6]

- *Needs*: The WDR indicates that poverty is higher in countries affected by violence. This development deficit adds to the humanitarian and recovery needs emanating from a natural disaster.

[3] World Bank, *World Development Report: Conflict, Security and Development* (Washington, DC, 2011).
[4] Drawing from the experience of responding to the Indian Ocean tsunami in conflict-affected countries, the UNDP review (*Evaluation of UNDP Contribution to Disaster Prevention and Recovery*) equally indicates that it is no longer possible to address disaster issues without also addressing the associated conflict dimension.
[5] We focus our analysis on sudden-onset disasters and, thus, exclude droughts and various forms of disaster linked to climate change. We also do not address external stresses such as the infiltration of organized crime and trafficking networks, spillovers from neighboring conflicts, and economic shocks.
[6] See also Villar Former, Mireia, and Markus Kostner, "Post-Disaster Needs Assessments and Post-Conflict Needs Assessments: Similarities and Differences," presentation at the orientation and awareness session on the development of a common framework for post-disaster and post-conflict needs assessments (Brussels, May 7, 2010).

- *Capacity*: Fragile and conflict-affected countries often have weaker institutions and more limited capacity. Moreover, leaders and government officials may perish in the disaster, further reducing available capacity.
- *Coverage*: Post-disaster assistance that focuses only on the disaster area risks creating discontent from unaffected but equally poor fragile or violent areas.
- *Timeline*: Post-disaster assistance is usually shorter-term in nature whilst, as the WDR points out, a transition process out of fragility can last more than a generation.
- *Leadership*: Leadership at the national level and/or in the disaster-affected area may be contested in a fragile or conflict situation, and citizens' trust in their leaders may be low.
- *Sensitivity to context*: A natural disaster can open new societal rifts, or widen already existing ones. At the same time, the post-disaster response can help or hinder a broader transition process. "Building back better" thereby acquires a societal dimension in addition to its established physical dimension.
- *Political and security dimensions*: Political processes and lack of security in fragile and violent settings can undermine the recovery process. The post-disaster response needs to include political and security considerations and requires continued adaptation to the evolving situation.

From a review of several recent cases we conclude that these differences have on the whole not been adequately considered in or integrated into the international community's post-disaster response. Though the sheer time pressure to respond to a major natural disaster undoubtedly contributes to a narrower focus on physical, economic, and financial assistance, the more binding constraint may be institutional. For instance, the World Bank views fragility and conflict and disaster reduction and recovery as two distinct lines of business. UNDP notes that while it is recognized that conflict can undermine the capacities of governments and communities to address natural disasters, and vice-versa, its own programming in the two areas does not reflect this fact.[7] And the Joint

[7] "Several factors contribute to separate programming in this area. First, the political sensitivities associated with conflict-related crises are much higher than those related to natural disasters. UNDP country offices are of the view that a complex crisis approach may delay programme implementation in both areas. Second, it is perceived that conflict and peace-building require more focused attention and cannot be tied to disaster risk reduction programmes. Third, […] the political space available for working on issues related to internal violence and conflict is sometimes limited. Fourth, mobilizing resources for joint programming has been difficult for the country offices, and funds are more often available for conflict-related support" (UNDP, *Evaluation of UNDP Contribution to Disaster Prevention and Recovery*, 39).

Declaration on Post-Crisis Assessments and Recovery Planning by the European Commission, the United Nations Development Group, and the World Bank discusses commonalities and differences in situations of disaster and of conflict but not any combination of the two.[8]

We now turn to possible elements of a differentiated approach to post-disaster assistance in fragile and conflict settings. In so doing, we follow the World Development Report and its framework.

Introducing Sensitivity to Fragility and Violence in Post-Disaster Assistance

WDR analysis of country cases reveals five insights from successful transitions. We discuss each of them by considering the particular circumstances of a natural disaster during a transition process.

> First, the state cannot address complex violent challenges alone. Successful national leaders have built momentum through "inclusive enough" coalitions—at both national and local levels.

An effective post-disaster response requires determined national leadership from mobilizing domestic and international resources all the way to taking corrective action when indicated by a robust monitoring and evaluation system.

An effective post-disaster response requires determined national leadership from mobilizing domestic and international resources all the way to taking corrective action when indicated by a robust monitoring and evaluation system. Given the enormous time pressure for saving lives and reestablishing livelihoods, decisive action is essential. Where the state's legitimacy and authority are contested and trust in leaders and state institutions is low, such decisiveness depends on the ability of leaders to establish a coalition that is inclusive enough to allow decisions to be taken swiftly and firmly so that the recovery and reconstruction effort can proceed unhindered. In turn, a well managed disaster response can help increase confidence in governance structures.

Situations vary, but the inclusion of the private sector, civil society, informal and traditional institutions, and women in inclusive-enough coalitions helps acquire broader societal legitimacy, as does the use of multisectoral community

[8] European Commission, United Nations Development Group, and World Bank, "Joint Declaration on Post-Crisis Assessments and Recovery Planning" (2008).

empowerment programs. Gaining the confidence of these stakeholder groups often requires policies that signal a break from the past and instill trust that the new directions will not be reversed.[9] In this regard, it may be particularly important for leaders to pursue an interdisciplinary approach that addresses not just the impact of a natural disaster but also the causes and consequences of the underlying violence. Aid providers need to be cognizant of the leaders' need to establish a strong-enough coalition and the time it may take to build it. A too rapid or technical intervention may jeopardize their ability to do so.

International actors can help facilitate the process of coalition building.

At the same time, even the worst natural disasters can provide opportunities for transitions from conflict and fragility, and international actors can help facilitate the process of coalition building. Taking advantage of such opportunities requires purposeful cooperation between the international aid and diplomatic communities. In the case of Aceh, the international community helped facilitate the negotiation of a peace agreement in 2005 while the post-tsunami recovery effort was in full swing. Another example is regional and international diplomatic action after Cyclone Nargis which opened space for the provision of aid; the two processes were linked closely through a Tripartite Core Group which comprised the government of Myanmar, the Association of Southeast Asian Nations (ASEAN), and the United Nations.

> Second, to restore confidence, some early, tangible, results need to be delivered in each transition period to restore confidence.

To restore confidence, some early, tangible, results need to be delivered in each transition period to restore confidence.

Experience has demonstrated that, given pervasive capacity and institutional constraints in many fragile and conflict-affected countries, "priorities and sequences go hand in hand. If existing capacity is focused on priority items in sequence (rather than dispersed at everything all at once), some items can move ahead rapidly, and once they have enough momentum to sustain gradual progress, the country can move on to tackle the next items."[10] The risks associated with operating in a fragile context notwithstanding, this concept is severely challenged in the aftermath of a major natural disaster when the need to deliver results is evidently the greatest.

[9] Civil society and other groups are not, however, without their own interests, and aid providers need to be aware of these.
[10] World Bank, *WDR*.

The default option in such instances is commonly the non-government execution model, mostly through international non-governmental organizations (NGOs). In general, this model can fill the immediate capacity gap and deliver results more quickly and more effectively than any other. However, cocooning such efforts into parallel channels that facilitate short-run accomplishment by bypassing national organizations and institutions can undermine national institution-building in the longer term.

In fragile and conflict situations, it is particularly important, therefore, to undertake local institutional and capacity development from the outset, in order to strike a pragmatic balance between the quick delivery of results and the strengthening of institutions and governance required for a transition out of violence. This should include the (more purposeful) use of local personnel and community systems.[11] Central to this balance is the careful crafting of an exit strategy. International agencies and NGOs that have both humanitarian and development mandates have demonstrated that bridges from relief to early results and institutional transformation can be built.[12] Such bridges are of even greater importance for post-disaster aid in fragile and conflict situations.

In spite of, or perhaps because of the inevitable heavy reliance on non-government execution, government itself needs to deliver early results, even if few in number, to build citizen trust. Otherwise, especially when a disaster occurs in a geographic area that is politically contested, the legitimacy of non-state actors may be strengthened if they are able to provide assistance more effectively than the government. Government actions that enhance social justice for excluded disaster- and conflict-affected populations appear particularly relevant. These can include (reform) measures that facilitate the aid effort and ensure proper targeting of affected groups, in addition to delivering select high-priority services directly.

[11] Perhaps by default as much as by design, community involvement still tends to be considered as hindering the speed of aid delivery, even though successful examples from post-tsunami aid in Aceh and post-conflict assistance in Afghanistan and Timor-Leste demonstrate the contrary. Two years after Cyclone Nargis, for instance, aid providers continued to be the main decision makers when it came to determining both the type of aid project and the process of implementation. As a result, there was a significant disjuncture between aid provision and the needs of certain groups in the community. See Tripartite Core Group, "Post-Nargis Social Impacts Monitoring" (April 2010) and World Bank and ASEAN, "Community-based Recovery in the Ayeyarwady Delta," Discussion Note for the Livelihoods Sector, Draft (2008).

[12] The phased approach to rebuilding the health sector in Timor-Leste prior to and after independence in 2002 is a particularly noteworthy example; see Bailey, Laura, "State (Trans-) Formation in Timor-Leste: Building Institutions that Contribute to Peace," Fragile and Conflict-Affected Countries Group, Occasional Note #3, (World Bank, 2008).

Delivery of some key actions in and of itself is not enough, however. As the WDR indicates, "citizens who lack credible information about progress made and challenges ahead will likely attribute the lack of visible improvements to a lack of political will and can lose trust in—and even turn against—those they believed or elected."[13] Timely, accurate, and easily understandable communication is equally important for the post-disaster recovery effort. The information needs of conflict-affected and other marginalized groups merit particular attention and call for the application of appropriate methods (and language) and technology (such as community radio).

Third, reform of security and justice institutions and employment generation need to be prioritized.

The WDR points out that in fragile and violent environments people's top priority after basic security and law and order is their own economic revival. Indeed, the importance of issues like land governance[14] and job creation[15] in the post-disaster response has been recognized. However, post-disaster aid in these settings needs to strengthen more explicitly than in a normal environment national institutions and governance to provide citizen security, justice, and jobs, all crucial to break repeated cycles of political and criminal violence. Prioritizing security, justice, and jobs does not mean addressing all the wide-ranging functions that will be needed in these areas as societies develop—but simply a focus on basic progress in these areas early in transitions to build resilience from violence.

A lack of security may be a constraint at the most fundamental level, hindering the access of aid providers to the disaster-affected area. Rioting and looting may destroy or divert scarce aid resources. This calls for closer cooperation between aid providers and security actors than is commonly the case. Moreover, dedicated security measures may be warranted as an integral part of a transition out of violence or fragility, but these in turn need to recognize and complement the aid effort.

[13] World Bank, *WDR*.
[14] Jha, Abhas K., "Reconstruction after Disasters: Ten Lessons (Learnt the Hard Way)," Presentation (2010).
[15] Independent Evaluation Group, *World Bank Group Response to the Haiti Earthquake: Evaluative Lessons* (2010).

Violence-affected groups lack access to justice in many fragile situations, and vulnerable groups (the poor, women, children, the elderly) often have little access to suitable counsel. These groups are also likely to be among the most affected by a natural disaster. Ensuring their due access to relief and recovery is, thus, not a matter of targeting or accountability only. For justice to be rendered, broader measures may need to be put in place quickly to reduce impunity and ensure the rights and safety of those affected by a disaster. Some aid providers may view activities such as linking the police to other justice institutions and using non-formal and traditional justice systems as longer-term issues that should be dealt with once the emergency and early recovery period is over. We argue that in fact, such activities require attention for stabilizing a doubly fragile situation with in turn a positive impact on the implementation of the aid effort.

Recovery and reconstruction need to generate jobs to compensate for the loss of livelihoods from violence and disaster. Reform measures that alleviate key bottlenecks identified by the private sector can be quick and effective wins. Labor-intensive public works programs are popular in fragile and post-disaster situations, but are rarely sustained beyond a two- to three-year horizon. This may be more acceptable in a normal post-disaster setting in a reasonably strong economy. As the WDR highlights, however, youth unemployment is consistently cited in citizen perception surveys as a motive for joining both rebel movements and urban gangs. Job creation programs, thus, need to go beyond short-term material benefits by providing a productive role and occupation for youth. Supporting self-employment and small businesses (for instance, through access to affordable finance, easing registration, and local purchases) is equally important for creating jobs and generating incomes.

> Fourth, pragmatic, "best-fit" approaches adapted to the local political context need to be adopted, rather than "one-size-fits-all" technical solutions.

Common to the post-conflict and post-disaster response is the temptation to apply "one-size–fits-all" technical solutions. In the rush to help after disaster strikes, it is too often the quantity and speed rather than the quality

of humanitarian and recovery aid that matters. And yet, even in stable situations, stories abound about tents being too flimsy to withstand storms, seeds and farming implements being ill-suited for a particular agro-ecological zone, or imported food seriously affecting local production. The same is true for technical assistance, the international community's general response to the pervasive capacity deficit in fragile situations. Because they are constrained by short contracts and under pressure to deliver outputs, technical advisors often bring with them a focus on transplanted best practices from other disaster experiences, which can undermine the search for tailored and context-specific approaches. A balance of local expertise and personnel, hopefully versed in local conditions, may help to remedy this.

Practical approaches are also important for monitoring the flow and use of funds, to enhance transparency, and to reduce the risk of corruption. Transplanted databases can be set up quickly, but may require a level of sophistication that is not achievable in a weak capacity context.[16] Even when they function effectively, they can only trace the funds to the activities that are financed, but not assess the impact on the ground. To fill this critical information gap, a range of tools have been developed through which citizens can hold state institutions and aid providers accountable and make them responsive to their needs, such as citizen report cards, community scorecards, and expenditure tracking surveys, as well as using SMS through cell phones. In fragile situations, such social accountability tools can contribute to build citizens' trust in the state and the aid effort, and warrant more purposeful inclusion in the post-disaster response than has hitherto been the case.[17]

> Fifth, countries that have moved away from violence have passed through a succession of transitions over time, not one "transition moment." The task of transforming institutions and governance for sustained resilience to violence is slow.

[16] See, for instance, Agustina, Cut Dian, *Tracking the Money: International Experience with Financial Information Systems and Databases for Reconstruction* (Global Facility for Disaster Reduction and Recovery, 2008).
[17] A notable exception is the post-disaster social impacts monitoring in Myanmar and the Philippines. See World Bank and Global Facility for Disaster Reduction and Recovery, *Tools for Analyzing the Social Impacts of Natural Disasters* (forthcoming).

A post-disaster response needs to be fast to save lives and restore livelihoods. Yet, as the WDR points out, historically, no country has transformed its institutions in less than a generation, with timings in most aspects of basic institutional development ranging from 15 to 30 years. Thus, among the greatest challenges for post-disaster assistance in fragile and conflict settings is the need to recognize this long time horizon of a transition process.

This challenge is three-fold. First, it is of critical importance that short-term post-disaster actions not undermine longer-term transition actions. Second, adequate assistance needs to continue beyond a normal reconstruction period. A poignant example is Aceh. Six years after the tsunami, most donors have withdrawn from Aceh, even though challenges to political stability and security remain, power-sharing arrangements between Aceh and Jakarta are still to be solidly defined, and peace is still not sufficiently consolidated.[18] Third, since multiple transitions are required for breaking the cycle of violence, set-backs in a transition process should not affect the post-disaster response.

In general, fragile transition processes are not the moment to pursue far-reaching political or economic reforms, as the WDR stresses. However, natural disasters may not only constitute transition moments themselves, they may also open specific reform opportunities. These are country-specific, but three stand out: reforming emergency response policy to allow for a faster and better coordinated response; reforming land policy to avoid those who have been affected severely by disaster getting hit twice by not being able to return to their place of livelihood or settle in a new place of their choice; and developing and implementing disaster risk reduction policy to reduce the impact of future disasters.

Many natural disasters are recurrent, such as floods and tropical storms. For many countries, it is, thus, not a question of whether another disaster will strike, but when. Consequently, the need to invest in adequate disaster risk

[18] *Multi-Stakeholder Review of Post-Conflict Programming in Aceh: Identifying the Foundations for Sustainable Peace and Development in Aceh* (December 2009). It is also noteworthy that within the first five years after the tsunami, funds for the post-disaster reconstruction effort were estimated at seven times the funds committed to reintegration and peace-building (IDR 9.0 trillion), whilst the estimated economic cost of the conflict (IDR 107.4 trillion) was almost twice the cost of damage and losses from the December 2004 tsunami (ibid.).

[19] See also UNDP, *Evaluation of UNDP Contribution to Disaster Prevention and Recovery.*

reduction/management measures is of even greater importance for fragile or conflict-affected countries, to build greater resilience into systems and institutions so that the next cycle of disaster does not lead to the next cycle of violence. This need cuts both ways, however. First, assistance during a transition process needs to pay more attention to risk management and reduction efforts and related capacity building. Second, to achieve effective results, disaster risk management efforts cannot afford to ignore investing in conflict prevention and aiding the transition process.[19]

ENHANCING THE POST-DISASTER RESPONSE IN FRAGILE AND CONFLICT SETTINGS

Guiding principles for a post-disaster response are routinely prepared during the damage, loss, and needs assessment process. These principles are adapted to context but generally include a focus on poverty reduction, community-based modes of implementation, transparency and accountability, and results. Such principles are necessary but not sufficient for fragile and conflict environments.

Fragile and conflict settings vary greatly, and so does the engagement of the international community. In Haiti, a large-scale effort to build the country's institutions had been underway prior to the 2010 earthquake. In Pakistan, a multi-agency Post-Crisis Needs Assessment for the Federally Administered Tribal Areas and Khyber Pakhtunkhwa had been completed just prior to the 2010 floods. In contrast, in Aceh, conflict had been raging between the warring factions by the time the tsunami hit, with very few aid providers present in parts of the province. And in Myanmar, the international response has been severely curtailed by the sanctions regime that had been in place prior to Nargis.

The previous section has identified a number of measures that can be taken by both national stakeholders and their international partners to make post-disaster assistance in fragile and conflict settings more appropriate. This section contains additional specific suggestions for the international response.

[19] See also UNDP, *Evaluation of UNDP Contribution to Disaster Prevention and Recovery.*

Integrating Conflict Sensitivity Into the Aid Response and Beyond

Because no two situations are alike, the WDR puts forward a differentiated political economy framework to: (1) specify the type(s) of violence occurring; (2) indicate the types of transition moments that are coming up, and the opportunities they present; (3) determine the stresses a country faces that increase the risks of violence occurring or reoccurring; (4) identify the stakeholder groups that are crucial to building confidence and transforming institutions as well as the signals, commitment mechanisms, and results that are most important to these groups; and (5) ascertain the paramount institutional characteristics and challenges. To this we add the type(s) of natural disaster the country has suffered from, and the implications for national stakeholders and international partners.

Spectra of Situation-Specific Challenges and Opportunities	
Types of Violence: Civil and/or criminal and/or cross-border and/or sub-national and/or ideological	Type of Natural Disaster: Earthquake, floods, tropical storm, tsunami, volcanic eruption
Transition Opportunity: Gradual/limited to immediate/major space for change	Key Stakeholders: Internal vs. external; state vs. non-state; low-income vs. middle-high-income
Key Stresses: Internal vs. external stresses; economic vs. political stresses; high vs. low level of divisions among groups	Institutional Challenges: Low vs. high capacity constraints; low vs. high accountability; exclusion vs. inclusion
Implications for National Stakeholders: Building of a coalition for quick action; identification of early results for government delivery, including priority reforms to facilitate the post-disaster response and recovery, etc.	Implications for International Partners: Selection of implementation modalities and risk mitigation measures consistent with building confidence; design of exit strategy; appropriate adaptation of "best practice", etc.

We argue that analyzing the country context during the immediate post-disaster assessment phase along these lines, and integrating the findings in the planning and implementation of the aid effort, would go a long way toward enhancing the adequacy, effectiveness, and sustainability of the international

community's post-disaster response. Depending on the situation and pre-disaster engagement of the international community, a dedicated conflict analysis could produce important additional insights.[20]

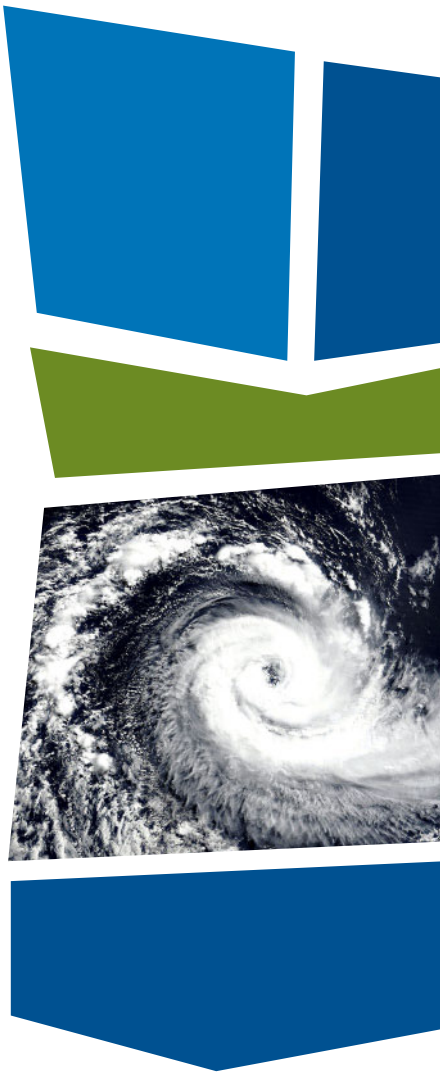
Since countries undergo multiple transitions out of violence, this framework, as well as the aid response (and any exit strategy from a parallel/non-government to a government execution model), should be reviewed and updated periodically to ensure continued appropriateness, in particular at different transition moments or when stresses are noticeably changing.

Moving from Coordination to Combined Programs

Coordination between main international actors in a post-disaster period has been difficult enough in the past. To aid a country that suffers from a natural disaster whilst undergoing a transition process requires a quantum leap in international cooperation in two directions.

First, humanitarian and development partners ought to ensure consistency between and promote the necessary continuum from the humanitarian response to recovery, reconstruction, and development. To date, in only two post-conflict cases, Georgia in 2008 and Liberia in 2004, did humanitarian and development partners fully integrate their efforts.[21] On the post-disaster side, humanitarian and recovery/reconstruction assessments have generally been undertaken in parallel or in sequence, but have not been adequately integrated.[22]

Second, as argued in the WDR, combined action by external actors across the security, diplomatic, humanitarian, and development disciplines under one overall program framework is necessary to support national institutional



[20] *As was the case in Pakistan, where a crisis analysis framework was prepared as part of the Post-Crisis Needs Assessment for the Federally Administered Tribal Areas and Khyber Pakhtunkhwa.*

[21] In the case of Georgia, the revision of the United Nations Flash Appeal and the Joint Needs Assessment (JNA) were conducted in parallel to ensure consistency between humanitarian, transitional, and development-oriented actions. The budget of the revised Flash Appeal was consolidated with that of the JNA to provide government and donors a complete picture of funding needs. This consolidation also facilitated the mobilization of resources for the revised Flash Appeal. United Nations and World Bank, "Georgia Joint Needs Assessment" (2008).

[22] The post-disaster needs assessment in the Philippines after Typhoons Ondoy and Pepeng in 2009 made an attempt to consolidate humanitarian and recovery/reconstruction needs at the sector level

transformations. For a post-disaster response, such combined action would be significant departure from past practice. Post-disaster-only solutions will inevitably falter, and a specialized suite of programs is needed in fragile environments, combining elements of security, justice, and economic transformation in addition to addressing the direct impacts of the disaster. Such a response would also need to come to terms with the dichotomy between impartial humanitarian aid and the political economy of institution- and state-building.

Managing Risks

Post-disaster situations are commonly characterized by a rapid international response. Even so, it can take a considerable amount of time until commitments are translated into activities (and even more so, impact) on the ground. Agency procedures often play a big part in such delays. As the WDR points out, historically, many procedures in international agencies were developed for more stable environments. For example, the procurement procedures of the international financial institutions were based on the assumption of ongoing security, a reasonable level of state institutional capacity, and competitive markets, none of which can be taken for granted in a fragile or violent context. Various agencies have adopted procedures that would allow a more nimble response to natural and man-made crises and disasters.[23] However, their application rarely reflects the particular challenges of protracted fragility, much less of responding to a natural disaster in such contexts.[24]

The more adequate use of (existing) simplified agency procedures is a necessary but insufficient ingredient to achieve faster impact on the ground. Even when the need to save lives and reestablish livelihoods is paramount, political and risk considerations ultimately determine the post-disaster response in situations of fragility and conflict. Such considerations play out in various forms.

At its most basic, the question is about the amount of financial support to be provided. For instance, in a context of various forms of sanctions, initial donor commitments to the United Nations' US$477 million Cyclone Nargis

[23] Such as the World Bank's Operational Policy 8.0 and Bank Procedure 8.0, *Rapid Response to Crises and Emergencies* (2008).
[24] See, for example, World Bank, "Rapid Response to Crises and Emergencies (OP8.00): Progress Report," Report No. SecM2009-0200 (2009).

Response Plan in Myanmar were comparatively modest.[25] In a related vein, the risk to donors of action (especially the potential misuse of funds) can outweigh the risk of inaction (such as renewed violence or institutional collapse) even for a post-disaster response. This "dual accountability dilemma"[26] can heavily influence the speed and the flow of funds.[27]

In both cases, the dilemma is clear: post-disaster assistance to and through weak national institutions is needed if they are ever to strengthen and help lead the transition out of violence, but their weakness in itself poses fiduciary and political risks to donors.

A range of approaches to engage with national institutions exist that deal with differing levels of fiduciary and reputational risk, such as the use of independent monitoring agents and external financial management and procurement agencies. At the same time, a mixture of state and non-state, bottom-up and top-down approaches is a better underpinning for longer-term institutional transformation, with shifting functions to national institutions over time, and has shown to both build confidence in the state and deliver results.[28]

Ultimately, though, donors need to be willing to accept a higher level of risk. As the WDR points out, "because returns to successful programs are high, international assistance can afford a higher failure rate in violent situations. This is not how most assistance works, however: donors expect the same degree of success in risky environments as in secure ones. A better approach is to adapt private sector principles for venture capital investment to support for fragile and violence-affected situations: pilot many different types of approaches to see which work best; accept a higher failure rate; evaluate rigorously and adapt quickly; and scale up approaches that are working." This stance has even greater relevance when responding to a natural disaster in a fragile or conflict situation.

Because returns to successful programs are high, international assistance can afford a higher failure rate in violent situations.

[25] About three years after the disaster, almost three-quarters (around US$350 million) were funded; Office for the Coordination of Humanitarian Affairs, "Flash Appeal: Myanmar Flash Appeal (Revised) 2008," funding status as of March 17, 2011, http://www.reliefweb.int/fts. In contrast, total damage and losses of Cyclone Nargis were estimated at about US$4 billion and recovery needs over a three-year period at US$1 billion. Tripartite Core Group, "Post Nargis Joint Assessment" (2008).
[26] World Bank, *WDR*.
[27] For example, early discussions about aid to post-floods Pakistan in 2010 included a proposal about conditioning pledges on the establishment of an acceptable governance arrangement.
[28] World Bank, *WDR*.

Enhancing the International Response

As indicated above, the post-disaster response in situations of fragility and conflict suffers from a lack of integration of the two streams within agencies. Using conflict specialists on post-disaster response teams in these settings as well as targeted staff training would be important steps. However, existing rigidities may require a more far-reaching organizational restructuring to achieve better orchestrated action.[29]

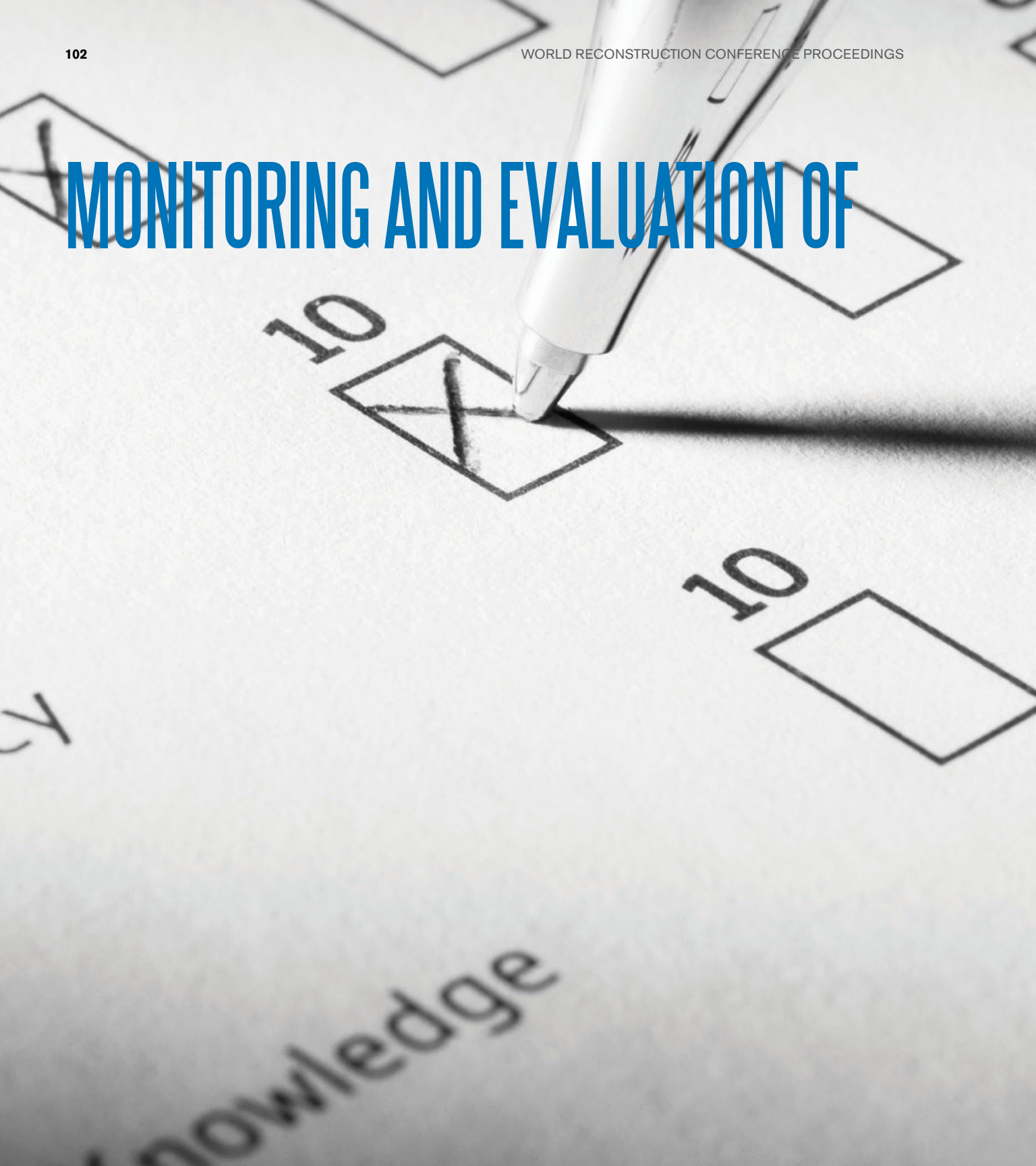
More generally, a broader consensus about the specific requirements of fragile and conflict-affected countries as they aim to address the impacts of natural disasters needs to be built to guide international action. In this regard, joint reflection on possible links between the Hyogo Framework for Action, which guides disaster preparedness, and the findings and recommendations emanating from the WDR would merit attention, as would an addendum to the Joint Declaration on Post-Crisis Assessments and Recovery Planning and the incorporation of the principles and approaches proposed in this paper in the guidance for Post-Disaster Needs Assessments.

CONCLUSION

International partners—bilateral donors, multilateral organizations, and international non-governmental organizations alike—have built sensitivity to fragility and violence into their post-disaster efforts at various occasions. However, they have done so largely individually, not collectively. The model that we propose is, thus, different from what we have seen to date. It aims to deliver a post-disaster response that addresses the impacts of the disaster and at the same time purposefully both cushions a disaster's impact on a country's social and institutional fabric and supports the country's transition process out of violence. Though different, this model would not slow down the post-disaster response as long as international partners have a common vision for addressing a natural disaster within a context of fragility, and are ready to overcome the different goals, planning timeframes, decision-making processes, funding streams, and risk calculus across disciplines to implement this vision.

[29] This organizational challenge is not unique to donor and agency bureaucracies, however. It is reflected in the institutional setup of many governments as well, where closer cooperation between disaster and peace bodies may merit equal attention.

MONITORING AND EVALUATION OF



DISASTER RECOVERY OPERATIONS AND PROGRAMS

by Ayaz Parvez, Sohaib Athar, and Patricia Fernandez

ABSTRACT

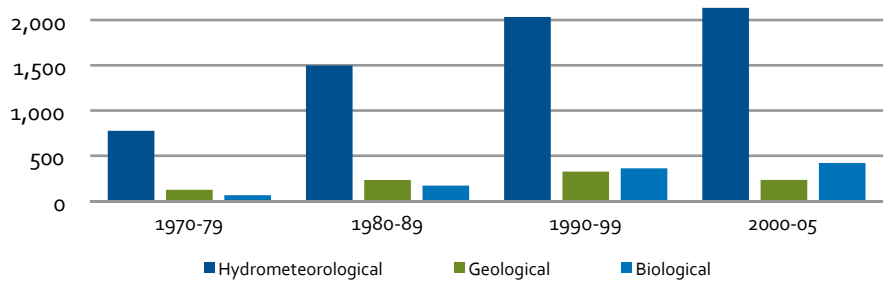
Efficient and effective post-disaster reconstruction has remained a challenge for both developing and developed nations throughout the world. The increasing propensity and impact of natural disasters create pressures and fatigues that make it difficult for reconstruction policy makers and implementation bodies to focus much on effective monitoring and evaluation – with some exceptions over the last few years. Monitoring and evaluation thus remains a challenge to reckon with in post-disaster situations, which in themselves can be extremely challenging propositions. An optimum trade-off between meeting expectations for rapid delivery and being able to do so while dedicating enough attention and resources for M&E is not easily achieved. This paper looks into ways and means that have been adopted contemporarily to deal with this dual challenge, and proposes some areas that can and should be strengthened without unduly taxing future reconstruction programs and resources. These include (a) governance and accountability systems; (b) results-based monitoring and evaluation; and (c) social impact assessments and monitoring.

1. INTRODUCTION: THE CURRENT STATE OF PRACTICE IN M&E OF RECONSTRUCTION AGENDAS AND PROGRAMS

Given the increasing importance being attached to M&E in the current global developmental agenda, this paper sets out to determine how similar robust systems for M&E can be applied to post-disaster reconstruction settings. While initiatives are being taken to cover this gap in more recent reconstruction programs, there is still not a standardized, agreed-upon M&E framework for assessing the progress and impact of recovery and reconstruction projects within the development community. This has led to a variety of M&E tools being implemented in such projects across the world over the last decade or so. As the development community moves towards results-based frameworks for designing, implementing, and evaluating their overall programs, a similar push is needed for recovery and reconstruction programs and projects in post-disaster settings.

It is not surprising, given the nature of post-disaster reconstruction programs that are set up on a fast-track basis, that progress on M&E for such programs has taken a back seat. However, now is as good a time as any to bring this issue into the limelight. Not only does it tie in well with the development community's focus on results-based program frameworks, it is also of extreme relevance in current times where we are beginning to experience mega disasters on a more regular scale than we have seen before. Reconstruction efforts after such disasters can temporarily take priority over country developmental agendas and involve substantial amounts of resources.

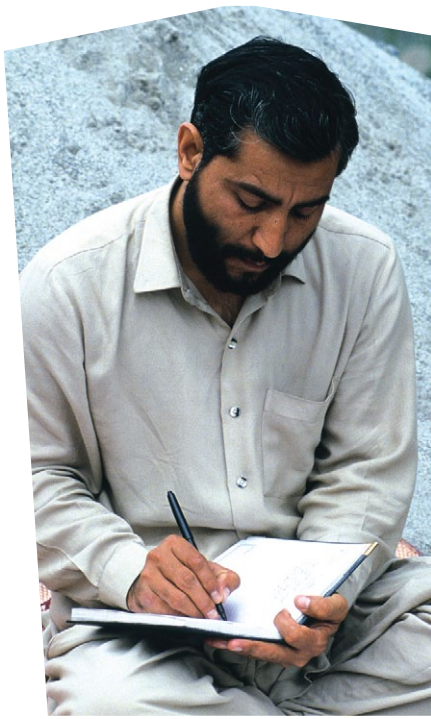
Figure 1. Distribution of Natural Disasters by Origin, 1970-2005



Source: Amin and Goldstein (2008).

2. SCOPE, OBJECTIVES, AND METHODOLOGY

Objectives: The objective of this paper is to highlight M&E of post-disaster reconstruction programs as a key area of interest that requires strong joint international focus and action given its relevance and urgency. It aims to do this by presenting in a concise form the existing knowledge on this topic. It provides an overview of the importance of and unique challenges facing M&E in such programs, and sums up international experience in overcoming these. It also aims to cover three thematic areas of special interest that collectively form a basic how-to model for M&E in post-disaster settings: governance and accountability of such programs; results-based performance management tracking physical and financial progress; and social impact assessments of such programs. Where possible, it links with cross-cutting themes that also have a link with M&E: institutional arrangements and financing of reconstruction activities. The paper incorporates information from case studies where appropriate, including models from two reconstruction programs to draw broader lessons: Indonesia Aceh/Nias earthquake/tsunami of 2004 and Pakistan earthquake of 2005.



Methodology: For this paper, a desk-based diagnostic review of various publications from a range of donor and government agencies has been carried out, which looks at drawing and documenting lessons learned from M&E practices adopted in various reconstruction programs. The paper also incorporates feedback obtained from key stakeholders in many sectors, including governance and accountability, tracking physical and financial progress, and social impact assessments. Detailed information on M&E activities has also been obtained from the Pakistan Earthquake Reconstruction and Rehabilitation Authority (ERRA) dealing specifically with its World Bank-financed Rural Housing Reconstruction Program. Finally, the section on social impact analysis builds on recent experiences of carrying out such qualitative research as part of Post-Disaster Needs Assessments (PDNA) in Myanmar and in the Philippines. Broader discussions on M&E frameworks and focus on social audits for reconstruction programs were also conducted with representatives of HelpAge, an international NGO with experience in conducting such activities in relevant settings.

3. REQUIREMENTS, MERITS, AND VALUE ADDITION OF STRONG AND MULTI-DIMENSIONAL M&E SYSTEMS FOR RECONSTRUCTION PROGRAMS

Reconstruction programs have often lagged partly because effective monitoring and control tools are either not available or not practiced. Even though extensive tools and methodologies have been developed for conducting M&E in development programs and projects, and strong international expertise and shared knowledge has been built on this topic within the development community, this has not translated effectively into a similar focus on reconstruction programs in post-disaster settings. The reasons are understandable: often, such programs are designed quickly due to the nature and urgency of the need, and there is very little time to collect reliable and useable baseline data to compare project results and outcomes with. Further, significant and sudden financial inflows in post-disaster areas, often developing countries, can sometimes overwhelm even well-designed and managed existing systems. This has led to situations where often multi-billion dollar investments have been made in post-disaster reconstruction without the necessary control to effectively deliver the desired outcomes of such investments. The results are obvious: not only have reconstruction programs lagged in timely delivery, their longer-term impact, particularly their contribution to the international developmental agenda, has not been fully documented or understood.

M&E frameworks across different reconstruction programs are not fully comparable and have been designed in localized environments. While this kind of flexibility has its benefits, it has hindered the mainstreaming of reconstruction programs into the overall developmental agenda, as the impact of these programs is hard to measure and compare across regions and with other development programs. This is compounded by the fact that most agencies and development institutions are seemingly more comfortable using their existing M&E frameworks and applying them to reconstruction programs. This lack of uniformity has been a hindrance in developing a collective toolkit for M&E with an exclusive focus on post-disaster needs and development objectives that is readily accepted by all development partners.

Now may be a good time for rectification and moving towards implementing M&E frameworks that are standardized or at least offer some level of consistency for reconstruction programs across various disaster types, development institutions, and regions of the world. Reconstruction programs may be poised to overtake, if not partially replace, the conventional development agenda that our community is now familiar with. In some parts of the world, this has already happened, e.g. in Indonesia after the 2004 earthquake and tsunami, in Haiti after the 2010 earthquake, and in Pakistan after the 2010 floods. For this reason, it is crucial that the development community catch up and put M&E at the forefront of reconstruction programs, just as it has done with conventional development programs.

Real-time and end program value addition from "Thinking M&E Systems" is quite possible even in expedient reconstruction scenarios: Developing and institutionalizing standardized and robust M&E frameworks for post-disaster settings will allow development institutions and partner governments to react in real time to fast-changing situations on the ground, which is a reality in post-disaster settings. This will enable them to make mid-course corrections in program design and implementation, and to reassess development outcomes as well as their underlying processes. This will help improve the likelihood of achieving development objectives for reconstruction programs by allowing partner agencies to understand, respond to, and help shape the dynamic situation on the ground. Thus, it is crucial that programs aiming to reconstruct social and physical infrastructure, livelihoods, and governance systems are not only kept track of consistently and regularly, but are also evaluated for their effectiveness and success in achieving development outcomes.

How is the monitoring function different from the evaluation function, and what needs to be monitored against what needs to be evaluated? A discussion of the nature of an M&E system needs to begin by drawing a clear distinction between monitoring and evaluation. In essence, monitoring aims to keep track of activities and results of post-disaster programs, while evaluation brings to light their (ideally causal) impact on the economic and social realities of beneficiary communities. In a post-disaster setting, this is especially

Monitoring aims to keep track of activities and results of post-disaster programs, while evaluation brings to light their (ideally causal) impact on the economic and social realities of beneficiary communities.

difficult because projects are hastily prepared, baselines that will be used for comparison in the evaluation process are often not prepared or available, and data are especially hard to obtain and analyze.

A results-based approach for monitoring, controlling and assessing reconstruction programs has many benefits and is easier to implement than is the popular perception: Compared to logical frameworks (LFs) as a tool to organize and implement development projects, results-based frameworks are better suited to measure intermediate-level and longer-term reconstruction and recovery outcomes. Importantly, the Results Framework (RF) approach simplifies outcome monitoring and evaluation, in that programs are assessed only against outcomes within their designed means and not against impracticable or un-attributable higher-level achievements. The RF approach helps develop clearer and streamlined "results chains" that systematically link (a) program and intermediate outcomes; (b) intermediate outcomes and outputs; and (c) outputs and inputs. The important difference between the RF and conventional LF approach is that RFs are not output-centric and do not burden the monitoring system with detailed input and output monitoring. This is achieved at the operationalization stage of the RF when systems are put in place to monitor physical and financial progress for inputs and outputs, combined with periodic measurements of intermediate outcomes. This helps with progressive problem identification and the design and targeting of solutions, and thus allows space for timely course corrections.

Effective and efficient M&E requires focusing on what needs to be essentially measured, as opposed to trying to measure each and every project or output: M&E systems for recovery and reconstruction programs can exist on many levels, and it is important to differentiate between them. These can be at the level of the overall national reconstruction program (which is by definition multi-sector and thus broad-based). At one level below, this can be done also at the sector level, encompassing all projects by all agencies covering one particular sector. Further down, an M&E system can also exist at the project level, covering individual projects. It is important to recognize that, at this level, not all projects need to be evaluated for impact, as it is often unfeasible to do so, or results and outcomes cannot be attributed to single projects.

Box 1. The Elements of Comprehensive Project Evaluation

The process of project evaluation contains four distinct steps:

- Monitoring: assessing whether a program is being implemented as was planned
- Process evaluation: analyzing how the program operates
- Cost-benefit or cost-effectiveness evaluation: assessing whether program objectives have been achieved in an economical or efficient manner
- Impact evaluation: trying to infer causality of the program on desired outcomes

Source: World Bank (2010), Chapter 18: Monitoring & Information Management.

Finally, M&E can be done at the level of beneficiary households, often by household surveys. It is here that social impact assessment and participatory monitoring tools such as community scorecards can be utilized.

Box 2. Ten Steps in Designing, Building, and Sustaining Results-Based M&E Systems

Traditional results-based M&E systems can be built and sustained by following the ten steps outlined below. With some modifications, these steps can be applied to post-disaster reconstruction programs to create strong M&E systems.

1. Conducting a readiness assessment
2. Agreeing on outcomes to monitor and evaluate
3. Selecting key indicators to monitor outcomes
4. Baseline data on indicators – where are we today?
5. Planning for improvements – selecting results targets
6. Monitoring for results
7. The role of evaluations
8. Reporting findings
9. Using findings
10. Sustaining the M&E system within the organization

Source: Kusek and Rist (2004).

Monitoring and managing governance and accountability-related risks associated with reconstruction programs offers much value addition in terms of inclusion, transparency, and equitable and fairer distribution of reconstruction support to disaster-affected populations. Reconstruction programs can be markedly different from conventional development projects in a number of ways, and these differences result in different kinds of risks associated with these

projects. These risks, if not accounted for and mitigated against, can undermine the effectiveness of the programs and strongly hinder their ability to achieve their development objectives. These risks need to be duly acknowledged and their mitigation needs to be adequately mainstreamed in the design, planning, and implementation of reconstruction and recovery programs and interventions. This requires the design of tools that can monitor these risks and offer timely solutions for reducing their negative impacts. These include amplified corruption and fiduciary risks due to pressures that can be brought to bear on existing governance mechanisms by the unsettling impact of major disasters. These are further exacerbated by the need for managing expectations for quicker recovery and for alleviating the suffering of disaster-affected populations, and also due to the amount, sudden injection, and pace of the flow of funds involved in such programs. Further, such expediency may cause compromises and leniency in the processes and safeguards going into such reconstruction programs that can eat at and undermine their transparency and efficiency. This can include contract management and procurement decisions that do not meet the normal standards set by country systems; moreover, these decisions can at times be laxly controlled by superior officials in view of the emergency situation. These pitfalls have been observed to have undermined and negatively influenced popular perceptions of even otherwise successful reconstruction programs. Choosing to have or not have adequately implemented governance and accountability systems can thus become a key determinant of the sustainability of reconstruction programs.

Not carrying out bottom-up social impact analysis as part of post-disaster needs assessments can mean that important social issues are missed in recovery and reconstruction efforts. Disasters impact social relations and cohesion in communities as well as physical infrastructure, but attention to the former is often not as forthcoming. Reconstruction programs with an exclusive focus on rehabilitating physically damaged infrastructure without an understanding of the social dimensions of the post-disaster situation run the risk of not addressing the specific needs of affected populations. In addition to this possible mismatch between community needs and the relief reconstruction support provided, reconstruction programs that are blind to the social impacts of disasters can further exacerbate tensions among affected groups. Specific tools to monitor and evaluate these aspects have recently been developed, as will be discussed in later sections.

Discussion Questions for Section 3:

i. What are some of the other risks that differentiate reconstruction programs from conventional ones? Do we have existing tools available that can help mitigate or account for these risks?
ii. How do M&E frameworks differ on the project level as opposed to the program level? At what level should M&E be conducted?
iii. What parts of conventional M&E systems can be readily adopted in post-disaster settings, and which areas need modification and customization?

4. GOVERNANCE AND SOCIAL/PUBLIC ACCOUNTABILITY

Governance, Accountability, and Corruption Mitigation and Control Frameworks

The risk of corruption in recovery and reconstruction programs is especially high due to the speed and quantity of disbursement of funds, which often flow through weakened, and in some cases even broken, formal governance and accountability mechanisms. This is also the case within monitoring and evaluation systems of these programs, exposing the entire programs to high governance and corruption risks. However, there seem to be ways to insulate programs from these risks, or to at least significantly mitigate them. Since time is of essence in such programs, rapid assessments can be conducted by the development community of country systems with a special focus on fiduciary risks, including public financial management and procurement systems.

Following the development community's enhanced focus on governance, including the World Bank's Governance and Anti-Corruption (GAC) strategy, most countries now have a reasonable amount of related reporting available. Some of these include: Public Expenditure and Financial Accountability (PEFA) Assessments, OECD DAC Baseline Indicators Procurement Systems Performance Assessments, Country Policy Institutional Assessments (CPIA), Fiduciary Risk Assessments (FRA), Corruption Perception Index (CPI) country results, and Actionable Governance Indicators (AGI). These are in

The risk of corruption in recovery and reconstruction programs is especially high due to the speed and quantity of disbursement of funds.

addition to most Country Assessment Strategies of development partners which contain valuable governance and accountability-specific information. International Financial Institutions (IFIs) such as the World Bank can provide technical assistance for this purpose as part of the reconstruction program. At a more specific and agency level, some standard tools can be utilized even in cases where a broad anti-corruption framework is not present. These include designing financial management and procurement systems ensuring bare minimum controls; establishing internal audit functions and conducting internal audits; creating and institutionalizing well-defined and rationalized job descriptions and having a rewards and recognition program; and placing qualified and competitively selected financial managers and auditors on implementation teams in addition to undertaking fiduciary and corruption risk assessments for partner organizations selected for implementing reconstruction projects.

The challenges of governance and accountability in post-disaster recovery and reconstruction programs are also a function of the extent and nature of damage suffered by the governance and accountability environment and the institutions comprising it. This seems to have been evident in Haiti after the 2010 earthquake, where the disaster affected the functioning of the central government due to its proximity to the seat of government, and may have adversely affected the strength of governance institutions that could manage a reconstruction program. Further, while there is always a need to balance the demand and supply side of governance and accountability mechanisms and interventions, disasters that incapacitate or damage existing systems are in absolute need of demand side interventions, particularly in the immediate post-disaster recovery. Such transparency, accountability, and participation (TAP)-based mechanisms can provide a temporary solution while the supply side and more formal mechanisms evolve and kick in to sustain the effectiveness of these governance and accountability mechanisms.

Box 3. Example: Anti-Corruption and Community-Driven Development in Indonesia Post-tsunami 2004

In the Indonesian Aceh/Nias reconstruction programs following the 2004 tsunami, an interesting approach was taken to reduce the risk of corruption. Some projects funded by the Multi-Donor Trust Fund (MDTF) were disbursed directly to communities and implemented through them using Community-Driven Development (CDD) activities, which proved to have minimal instances of corruption. In general, local NGOs in Indonesia have over the years created networks and taken a leading role in monitoring corruption. Also, the Asian Development Bank and other donors funded capacity-building activities of the country's Supreme Audit Agency to enable it to audit Badan Rehabilitasi dan Rekonstructsi (BRR), the overall public reconstruction agency.

Source: World Bank and BRR (2005).

Participatory and Demand-Driven Grievance Mechanisms

Participatory and demand-driven grievance redress mechanisms (GRMs) are critical to the legitimacy and perceived success of reconstruction programs, and are crucial tools in accountability and reducing the risk of corruption. For this purpose, they are considered an integral part of reconstruction programs in general, and their monitoring and evaluation components in particular.

The success of public grievance redress or complaint handling mechanisms relies on having their own monitoring and evaluation system embedded within them, with oversight by the interim emergency setup until the overall reconstruction agency or an equivalent body is fully operationalized. This is best done by including a complaint/grievance redress module within the project's overall M&E system. Monitoring such mechanisms must not only include the process of tracking complaints and follow-up solutions but should also provide real-time feedback and feed-forward loops. Providing feedback

Grievance redressal mechanisms must not only include the process of tracking complaints and follow-up solutions but should also provide real-time feedback and feed-forward loops.

to the complainants enhances credibility of the M&E framework and encourages whistle-blowing and increased participation. The feed-forward loop to the recovery and reconstruction management setup, amongst others, has a few benefits. One, it helps to review and revise the implementation strategy in addition to reviewing and designing strengthened demand and supply side accountability mechanisms. Further, the process provides valuable information to the project and sector teams to design risk mitigating strategies that are based on governance and accountability operational realities. These specific strategies can be in addition to opportunities for real-time review and consolidation of the overall strategy. The benefits of such a system, through regular reporting on complaints, their redress, as well as impact trends and indicators, outweigh post-facto learning of lessons.

It is also important to highlight that the nature of a participatory grievance redress mechanism at the project level will be quite different from one at the level of the overall reconstruction program. In fact, designing such a mechanism at the project level should be a priority for any reconstruction effort as it will be used by direct project beneficiaries and become a crucial part in measuring the performance and impact of the project. As for having such a mechanism at the program level, there is still some work to be done to arrive at some of the key performance indicators (KPIs), if any, for an overall mechanism for a reconstruction program, which can then be monitored and evaluated under a framework. In general, individual project-based grievances and complaints are different from overall reconstruction program grievances, and in the latter case the aggrieved may not even be the direct beneficiary or a potential beneficiary of the program. For example, the local construction industry may be affected by the introduction of new construction technologies during the reconstruction program.

Box 4. Example of Grievance Redress Mechanism in the Pakistan Earthquake of 2005

The Earthquake Rehabilitation and Reconstruction Authority (ERRA) set up after the 2005 disaster in Pakistan had a grievance redress mechanism that is worth looking into for lessons learned. The mechanism was fast-track and of an informal nature at the community (village) level, mostly run by partner organizations which included local and national NGOs. On a formal level, various local government offices at the sub-province (district) level were put in charge of addressing and resolving complaints. To deal with complaints regarding registration, data errors, and payment records, the national-level government authority dealing with registration of individuals and issuance of identity cards was given the appropriate authority at sub-provincial (district) level, as it already had "data registration offices" in these locations.

However, the system was not without its share of problems. Most importantly, most local-level records were kept manually, which led to significant delays at the time of complaints and staff being overwhelmed by the records. However, the system itself was MIS-based at headquarters.

Source: ERRA.

Social Audits

The beneficiary community can also play a vital role in increasing accountability of the program as a whole, helping ensure it is meeting its required objectives, and in assessing its success and impact after completion. A tool that can be used for this purpose is social audits. During implementation, it can assist government and donor agencies in assessing loopholes and leakages, while after completion a social audit can be conducted to evaluate their success in achieving medium- and long-term outcomes. In fact, programs that do not incorporate social audits in their M&E design risk "missing the mark" in terms of community needs, or at least being perceived as such.

Ideally, communities should be involved at the planning stages to better assess their needs. However, this has its own set of challenges. For one, this takes a lot of time, and thus there is a trade-off between the need for participatory planning and swift reconstruction. Further, as was seen in Aceh/Nias in Indonesia, there are often gaps in coordination, and also rivalry, amongst various NGOs that are all aiming to assist communities with mobilization and participation, which causes anxiety if not outright resentment in the community. Interestingly, within Aceh and Nias, the various local and international NGOs solved this problem by creating community-driven development (CDD) working groups under the leadership of local and provincial governments to assist in coordination.

Discussion Questions for Section 4:

i. In cases where governance capacity and institutions have been severely impacted by the disaster itself, what kind of institutional mechanisms should be recommended for post-disaster reconstruction? How will this differ from cases where governance capacity has been only marginally affected by the disaster?
ii. What is the scope of public-private partnerships (PPPs) as an institutional design for reconstruction programs, given international experience in post-disaster situations? Do such kinds of arrangements perform better, or at least more efficiently, than entirely public-sector-driven reconstruction programs?
iii. How can we differentiate between program-level and project-level grievance redress and complaint handling mechanisms? Can we define indicators and create standards that will help establish program-level GRMs?

5. RESULTS-BASED PERFORMANCE MANAGEMENT

In order to increase the efficiency, responsiveness, and accountability of a reconstruction program and relevant agencies/departments, results-based performance management can be utilized. This can then be effectively monitored on a regular basis to track physical and financial progress

of project-level activities as well as performance in comparison to defined indicators and targets. This kind of framework ensures that M&E systems are embedded within the operation of the reconstruction program. The following section looks at some key considerations as well as examples of systems that track financial and physical progress of reconstruction programs/projects.

Key Considerations in M&E Systems for Reconstruction Programs: On a basic level, the success of an M&E system lies in its ability to assist the following functions: First, it should be able to provide regular and comprehensive information on allocation and disbursement of funds (covering all possible sources, including private, if possible). Second, it should track physical progress of reconstruction activities. Finally, it should provide enough information to allow at least a preliminary evaluation of economic and social impacts of reconstruction programs ex-post.

Experience suggests that an important way in which M&E can be successful in tracking both outputs and medium- to long-term outcomes is if key performance indicators (KPIs) are identified as part of the project plan, as that will provide a basis for M&E throughout the project's life. It is also seen that various agencies and donors have their own protocols for defining KPIs and collecting and tracking information on their programs. This can lead to problems of comparability with international standards and other reconstruction programs in judging the overall effectiveness and success of the reconstruction program.

According to the experience of M&E practitioners in post-disaster settings, the system should be robust enough to assimilate the data coming from various sources. Further, practitioners insist that an M&E system should serve the function of allowing mid-course corrections to achieve project objectives based on real-time information flows.

Box 5. Tracking Financial Progress in Indonesia - Earthquake and Tsunami of 2004

Important insights can be gained from Indonesia's system to track financial progress of reconstruction and recovery program after the 2004 tsunami. The system was managed completely by the country office of the World Bank, which was given this authority by the Indonesian government, as well as the Badan Rehabilitasi dan Rekonstructsi (BRR), the national reconstruction agency. Sources of input in this system included the comprehensive needs assessment to serve as a baseline; project concept notes for all projects, detailing financial needs as well as indicators on outcomes and anticorruption measures; the reconstruction agency budget that derived from the national Master Plan for reconstruction; and, finally, regularly updated information of all reconstruction and recovery projects run by donors and the top twenty NGOs.

The system's regular output included four key charts that proved highly useful, especially amongst the donor community, in showing financial progress. However, access to this output was limited in general as it had to be pushed out because of its manual nature, as opposed to being readily accessible. Further, the general public and other stakeholders could only access the published quarterly and half-yearly reports. This was in contrast to the Development Assistance Database (DAD) which provides real-time access and thus has more scope for providing accountability. This system is briefly described in the background paper on IT Innovations: Reconstruction 2.0 in this volume.

An area of improvement for the M&E system in Aceh is that it gave primary importance to quantitative indicators such as the number of completed houses and occupancy rates as a proxy for quality or acceptability to beneficiaries. The results-based framework, however, provides clear guidance on the importance of and need for tracking outcomes, as opposed to specific outputs. In this instance, for example, this could have been measured by also tracking the number of people not in need of relief shelters as a measure of medium-term program outcomes.

Source: McKoen (2007) and da Silva (2010).

Tracking Aid Flows to Monitor Post-Disaster Activity: In the context of monitoring physical and financial progress to provide information for results-based management and the evaluation of reconstruction projects, it is also relevant to highlight the importance of tracking flows of aid and finances for recovery and reconstruction activity. Systems that exist for tracking financial flows for reconstruction programs and projects can provide relevant and timely information in the monitoring aspect of these activities. International experience suggests that a system for managing and tracking information flows (dealing with physical and financial progress) regarding various development projects in a particular country will be more resilient in post-disaster scenarios if it was institutionalized prior to the occurrence of a disaster. This implies that national disaster information management systems should be strengthened on a regular basis, especially in disaster-prone countries, to build DRM capacity. It is also crucial that these systems are designed and run in such a way that they have "operational relevance" and familiarity for stakeholders in the event of a disaster. Having said that, it is considered almost inevitable that there will be challenges in information coordination, especially as disaster response moves from relief to recovery to reconstruction.

Box 6. Tracking Aid Flows in Indonesia – Earthquake and Tsunami of 2004

In developing an M&E system that keeps track of physical and financial progress of reconstruction programs, key lessons from Indonesia can be summed up below:

1. Information technology can help, but it is important to remember that it is people who need to track money. Low-tech, labor-intensive data input was superior in Indonesia compared to high-tech information systems such as the DAD.
2. It is important to try to capture every project in the reconstruction program, whether implemented by the government, an NGO, or directly by a donor. But it is also important to focus on top players that have the bulk of the projects instead of all players (in Aceh/Nias, for example, the top 20 implementing agencies were responsible for 85 percent of reconstruction projects by value).

Box 6. Tracking Aid Flows in Indonesia – Earthquake and Tsunami of 2004 (continued)

3. Use the Post-Disaster Needs Assessment (PDNA) as a starting guide to assess the reconstruction portfolio.
4. Match sector-wise expenditure with PDNA categories to the extent possible.
5. Commitments and disbursements are more important than pledges. However, it is essential to avoid double counting by focusing on either the funding or executing agencies. In Aceh, the Reconstruction Expenditure Tracking Analysis Methodology (RETAM) focused on executing agencies to track the portfolio of reconstruction projects.
6. Build a master table that has all the projects listed by sector and executing agency. Update it regularly and use it to track project status.

Source: World Bank (2007).

More donors are hesitant to provide fungible sources of funds as direct budgetary support and instead support sector-specific recovery and reconstruction programs.

Besides looking at systems for monitoring and tracking financial progress and donor aid, it is also important to mention some unique features of reconstruction finance that require different operating and monitoring processes. For one, reconstruction budgeting has three characteristics: speed with which financing is allocated and disbursed; the need for flexibility and often fungibility; and the presence of multiple actors as opposed to the single actor in conventional public sector budgeting (the government). A key challenge in managing financial flows in such cases is to account for already-existing country systems while meeting reconstruction needs and requirements.

Another challenge of reconstruction financing that may cause conflict with conventional public sector standards is the need for fungible funds. It is often the case that some sectors receive more funding than is required based on the needs analysis, and so to fulfill the gaps in other sectors the reconstruction agency may need to transfer surplus funds across sectors. However, most donors are hesitant to provide fungible sources of funds as direct budgetary support and instead support sector-specific recovery and reconstruction programs.

Usually, budgetary support is provided for cross-cutting sectors and those activities that support the entire reconstruction program, such as capacity building for agencies, financial management information systems, etc.

Finally, it is also interesting to keep track of a seemingly new trend in reconstruction financing. In the response to the 2004 tsunami, the international non-profit (INGO) sector emerged as an important source of financing, as its fundraising activities (which were largely web-based) were often more efficient and substantial than official donor assistance. These "transnational charities" not only raised a significant amount of funds, but were also fast in spending them on relief, recovery, and reconstruction activities, often before the creation of national-level reconstruction master plans and setting up of official agencies. This seems to have reversed traditional roles in humanitarian operations as NGOs have become major donors themselves instead of relying on UN agencies and official donors to finance their operations. This is, however, also problematic. All these INGOs have their own frameworks for monitoring and evaluating aid effectiveness and the achievement of outputs and intermediate and long-term outcomes. For this, they have developed their own systems for collecting, analyzing, and reporting information. This may make the task of coordination for information management and M&E even more challenging in the case of future disasters.

Monitoring of Intermediate Outcomes and Evaluation of End-Program Results: Global experience points to the need for having a simplified but results-centric M&E regime for reconstruction programs. Central to such an approach is the development and operationalization of an overarching Results Framework (RF) that harmonizes and integrates all the pillars and areas of a reconstruction program. This RF is an improvement over conventional logframe-based (input and output) results measurement in that it establishes a more streamlined results chain by focusing on key results/outcomes and by measuring intermediate outcomes instead of outputs. Intermediate outcomes are hence carefully designed in this system to capture and track the intended changes as they begin to unfold or otherwise, and provide the tools for not only monitoring and evaluation, but – importantly – for controlling the process and pace of progress of achieving the desired results.

Measurement of Key Indicators Only at the Aggregate Level and Reducing Redundancy of Information Flows: Such systems, however, need to be based on pre-determined analysis plans for the use of outcome and intermediate outcome information generated through the results monitoring system. This will help in the initial selection and rationalization of outcome indicators and subsequently ensure that the information generated does not burden the results monitoring system with surplus data, as even collecting credible, sustainable data on a few key outcomes can be a challenging task. Such systematized analysis plans for incoming outcome information will help task teams affect periodic course corrections in implementation and even in bringing about major strategic shifts where required.

Treatment of Externalities: While maintaining close strategic alignment with higher-level goals, the RF will not directly incorporate goals, conditions, and externalities that are beyond the control of the reconstruction program. While this ensures that the reconstruction program remains responsible for achieving results within its designed means, it also conversely allows greater and more accurate attribution of outcomes and impacts generated by key reconstruction interventions.

Results Operationalization Principles and Modalities: The Results Framework proposed above needs to be operationalized through the development of a Simplified and Streamlined Results Measurement Model that will allow comparable and relative measurement of outcome, intermediate outcome, and output indicators of both quantitative and qualitative nature. The model could be based on a fusion of contemporary quantitative, statistical, and qualitative techniques for results measurement. However, caution is advised in the premature development of the RF that needs to undergo a process of refinement and rationalization, by taking into account factors such as the availability of data and the relative ease of operationalizing a reliable and sustainable data supply mechanism for the respective indicators. The RF must also be presented for consultations with the relevant stakeholders.

Separation of Monitoring and Evaluation Functions: Together, these program and intermediate outcome indicators should form a well-deliberated causal results chain, under which intermediate outcome indicators will primarily be used for regular monitoring of strategic progress being made towards the achievement of the eventual program outcomes. The program outcome indicators shall primarily, but not necessarily, be used for the periodic program evaluations planned under the proposed results management regime. In some cases, it is likely that program outcome indicators may also be used for monitoring and control of strategic progress being made by various program interventions.

Results Monitoring System: The RF is then to be operationalized through the setting up of systematic Results Monitoring Systems (RMS) that lay out and specify the monitoring and evaluation plans, data collection instruments, and indicator value-determination methodologies for all outcomes and intermediate outcomes. Once fully developed, the RMS will also provide an overall medium-term monitoring and evaluation plan. This plan will specify the frequency, requirements, and means for monitoring, evaluating, and reporting, both at the broader level and for each of the selected outcomes. The RMS will also provide present-day indicator values or baselines and will set medium-term target values for program-level outcomes. Whereas most program-level outcomes will contain mid- and end-term target values, it will be possible to measure intermediate outcome indicators at yearly or biannual levels.

Box 7. Results and Intermediate Outcome Monitoring in Pakistan - Earthquake Housing Program 2005

The Earthquake Rehabilitation and Reconstruction Authority (ERRA) was the leading government agency responsible for reconstruction programs in Pakistan after the 2005 earthquake. In particular, ERRA implemented a multilateral donor-funded rural housing program where a comprehensive system to track physical progress was developed. This system, called RME (Reporting, Monitoring, and Evaluation), was used in conjunction with a UN-Habitat-developed Training Information Management System (TRIMS) to monitor the housing program.

Box 7. Results and Intermediate Outcome Monitoring in Pakistan - Earthquake Housing Program 2005 (continued)

ERRA, in partnership with the World Bank and UN-Habitat, developed an approach and software for monitoring the intermediate outcomes (i.e., interim seismic compliance rates) and evaluating the end-program outcomes of the housing program. A simplified by-product of this included a series of color-coded maps that showed sub-district-level houses to be reconstructed and compliance rate at plinth and lintel levels. Compliance was high at plinth but low at lintel levels in most instances. It was a good tool for highlighting the areas where the compliance was too low and for the investigation of the reasons for low compliance, resulting in targeted interventions. The system also established that there was always going to be a difference between the physical progress on the ground and the financial progress, as the data of physical progress was punched immediately, whereas the form triggering the release of a subsequent tranche would reach ERRA much later. Every effort was made to bring this time, from the compliance at the field level to the release of payment by ERRA, as low as possible. This led to the creation of supplementary non-compliance monitoring and mitigation tools such as the Non-Compliance Referral System (NCRS) and the Compliance Catalogue that suggested retrofitting measures for beneficiaries who had started reconstruction already but were not compliant with the standards set out by ERRA.

However, a crucial element in this was the existence of a national-level government database meant for registration of citizens and issuance of national identity cards. Run by the National Database and Registration Authority (NADRA), this pre-existing system and its related technological capacity allowed ERRA to match physical progress with financial grant disbursement data and register eligible beneficiaries electronically.

Source: ERRA.

End-Program Evaluation: Achievement of Medium-/Long-Term Impact: A big challenge to impact evaluation in reconstruction programs is the disaster environment itself. It is difficult to ascertain in isolation the development impact

of a particular project in given physical locations in situations where various institutions are conducting similar projects in the same area. This is exacerbated by the fact that some stated outcomes in such projects are of a qualitative nature (examples include "commitment to building back better" or "greater community participation"), which require special measurement tools and techniques. In such a situation, it is important that indicators are selected with a nudge towards realism and practicality, and third-party outsourcing should be strongly considered for running monitoring and evaluation, especially the latter.

In settings such as these, one way to get around the problem is to use the contribution approach to ascertain the impact of a particular project/program towards the achievement of development objectives, as opposed to directly attributing outcome results to the existence and performance of the project/program. This approach, used by the Global Facility for Disaster Reduction and Recovery (GFDRR) to measure its contribution towards mainstreaming disaster risk reduction activities in various countries and conceptualized in its Results Framework, recognizes the challenge of direct attribution of impacts to projects in settings where various similar projects exist.[1] Similar methodologies can be used to assess the impact of reconstruction projects or programs of specific agencies in complex, multi-stakeholder environments where traditional impact evaluations may be unfeasible.

Discussion Questions for Section 5:

i. What are the relative merits and weaknesses of the various tools available to track project-level physical and financial progress of reconstruction programs, according to the collective experience of conference attendees? How is the design of such a system dependent on local and national realities, and what are some universally applicable lessons learned?
ii. How much flexibility should exist in performance indicators, given that reconstruction programs are operating in dynamic, rapidly changing environments? Who should be responsible for redefining or adjusting such indicators, if need be?

[1] See the GFDRR's Results Framework for more details on this proposed methodology based on "contribution" as opposed to "attribution."

iii. How feasible is it to have a robust results monitoring system that relies on a chain of measurement for program and intermediate outcomes and corresponding outputs in often chaotic post-disaster reconstruction programs?
iv. How should project-level impact evaluations for reconstruction programs be conducted and interpreted given the usual lack of baseline data and the presence of various overlapping projects with similar objectives in the same disaster-hit regions?

6. SOCIAL IMPACT MONITORING AND ASSESSMENT

Natural disasters can have profound impacts on the social fabric of affected communities. People affected by them have to draw on social and community bonds to help one another survive and overcome the immediate aftermath. The disaster may change the gender, ethnic, religious, generational, and socioeconomic composition of their communities, and leave certain groups particularly vulnerable. Focusing on how to rebuild their lives is a collective challenge for affected communities and tests the strength of social bonds, the level of social cohesion, and their ability to solve problems collectively. These and other social factors, such as the nature of local leadership and decision-making, can have a profound bearing on the success of the recovery effort.

The disaster response itself can also affect local socioeconomic structures and relations. The levels, sources, and types of aid provided and targeting mechanisms used may meet the needs of certain groups within communities better than others. The way that aid providers define vulnerability and marginalization may differ from the way that community members themselves do. The process of and participation in aid decision-making may empower certain groups and affect social hierarchies. Finally, managing recovery and reconstruction funds can affect village leadership and local governance and alter the relationship between community members and their leaders. The strength of any post-disaster aid effort depends on how programs respond to and reflect such changing needs and dynamics. It is thus important to track the social impacts of natural disasters and to monitor how they are affected by and in turn influence the recovery effort.

The current instruments used in PDNAs, which rely on mostly quantitative research methodologies, are excellent at capturing the 'what' and 'where' of disaster response. Adding mostly qualitative social analysis can help illuminate the 'how.' It can give insight into local perceptions of need; highlight structural exclusion issues not otherwise reported that need to be factored into designs; provide on-site design and performance feedback; enable more tailored priority setting; and provide information on early warning, especially for sensitive issues such as emerging conflict and corruption.

Key Domains of Social Impact Assessment and Monitoring: Social analysis in the aftermath of the disaster can be broken down into two stages: (i) the initial social assessment, which can be conducted as part of the PDNA and which can highlight issues that are likely to emerge, establishing a baseline for future monitoring; and (ii) ongoing social monitoring to track the impacts of the disaster and aid effort over time. Domains that can be studied in post-disaster social analysis include the following:

Community Perceptions of the Aid Effort

- Overall patterns of aid: what has been delivered to whom, needs and shortfalls
- Aid targeting: how aid is targeted, equity, vulnerability, and marginalization
- Process of aid delivery: who distributes aid, what information is available
- Process of aid decision-making: who is making what kinds of decisions and how
- Accountability: complaints mechanisms and follow-up, resolving aid disputes

Socioeconomic Relations

- Livelihoods and employment: e.g., effects on farmers, fishers, micro-enterprises
- Debt and credit
- Land use and ownership; management of water and other resources
- Migration

Adding mostly qualitative social analysis can give insight into local perceptions of need.

Social Relations and Village Institutions

- Social capital and collective action
- Relations among groups (gender, age, religious, ethnic, socioeconomic)
- Structure and function of community organizations
- Participation, inclusion, and cohesion
- Community leadership
- Links to outside institutions

The research instruments used are primarily qualitative but may also include some quantitative research. They include in-depth interviews, focus group discussions, participation observation, direct observation, and surveys. Usually a large-enough sample size is chosen to enable comparison among research sites and a cross-section across different variables, such as geography, level of damage, primary livelihood, and urban/regional settings. In selecting a research team, it is important to find the right local partners and to ensure that researchers have social science skills, local knowledge, local access, and good interviewing, data management, writing, and analysis skills.

Recent Experiences of Social Impact Assessment and Monitoring: Two examples where social assessment and monitoring have been incorporated into post-disaster response of the international community are Myanmar after Cyclone Nargis in May 2008, and the Philippines after Tropical Storm Ondoy and Typhoon Pepeng in September and October 2009. The examples highlight the benefits of conducting social analysis in the aftermath of disaster and identify some practical challenges that can be faced.

Box 8. Social Impact Assessment in Myanmar – Cyclone Nargis in 2008

In May of 2008, Cyclone Nargis hit the Delta region of Myanmar, home to 7.4 million people. The cyclone killed approximately 140,000 people and left 2.4 million people severely affected. The damage and loss caused by the cyclone was estimated at US$4 billion.

In the aftermath of the disaster, the Government of Myanmar, the United Nations, and ASEAN set up a Tripartite Core Group (TCG) to oversee the disaster response. The TCG, supported by the World Bank and Asian Development Bank, conducted a Post-Nargis Joint Assessment to assess the damage and losses caused by the cyclone. The assessment included an analysis of the social impacts of the cyclone, which identified a strong level of social cohesion but indicated, among other things, a risk of redistribution of land from small-scale farmers to larger landholders and a risk of indebtedness.

The Post-Nargis Joint Assessment was the first time that an assessment of the social impacts of disaster was included as part of the formal assessment of damage and loss. In the aftermath of the disaster, the TCG set up a monitoring system, which included ongoing monitoring of the social impacts of the cyclone. This monitoring had three main focus areas: aid effectiveness (including needs and shortfalls, targeting and decision-making, aid equity and complaints), socioeconomic impacts (including impacts on farmers, fishers, and casual laborers, indebtedness, migration, and displacement), and impacts on social relations (including impacts on social capital and cohesion, group relations, and relations among villagers and leaders).

Reliable statistics and community-level information in Myanmar were scarce. A local NGO with good local knowledge and networks was engaged to conduct the research, which involved in-depth interviews, focus group discussions, and participant observation, and took place in three rounds: roughly six months, one year, and two years after the cyclone.

The research identified key issues that would not have emerged through the standard methodologies. These included issues of aid shortfalls, aid equity,

Box 8. Social Impact Assessment in Myanmar – Cyclone Nargis in 2008
(continued)

and complaints mechanisms, along with the provision of some inappropriate livelihoods aid. The most important finding, however, was that affected villagers faced a problem of spiraling debt and a credit crunch. With extremely high interest rates, big farmers were unable to recapitalize, which in turn reduced employment for casual laborers, who were also in debt. As a result, affected villagers had begun to downsize. Farmers began losing land to moneylenders and sought work instead as casual laborers. The experience of fishermen was similar, with many ending up as casual laborers.

As a result of the findings of the Social Impact Monitoring study, donors, UN agencies, and international and domestic NGOs in Myanmar focused their attentions on questions of aid effectiveness and on local socioeconomic structures, debt, and credit. In particular, the TCG included a US$50 million budget request in their Post-Nargis Recovery and Preparedness Plan to help address rural indebtedness and livelihoods.

Source: World Bank staff.

Box 9. Social Impact Assessment in the Philippines - Tropical Storms Ondoy and Pepeng 2009

In September and October 2009, Tropical Storm Ondoy and Typhoon Pepeng hit the Philippines in rapid succession, affecting Metropolitan Manila, neighboring Rizal province, and Central and Northern Luzon. Almost 1,000 people died and 9.3 million people were affected. Damages and loss were extensive, estimated at US$4.38 billion, almost 2.7 percent of GDP.

In the aftermath of the disaster, a social impacts assessment was conducted as part of the Post-Disaster Needs Assessment. The analysis contained three main focus areas: livelihoods and coping strategies, social relations and cohesion, and local governance and social accountability.

Box 9. Social Impact Assessment in the Philippines - Tropical Storms Ondoy and Pepeng 2009 (continued)

The research was carried out in partnership with the Department of Social Welfare and Development (DSWD), a local university (*Ateneo de Manila*), and civil society organizations. In urban areas, researchers paired up with NGO networks to gain access to affected communities. In rural areas, the PDNA team conducted the research directly with support from DSWD. The research teams used participant observation, focus group discussions, and in-depth interviews to conduct the research.

The analysis highlighted key issues that would not have been captured using the standard methodology alone. These findings centered around governance, social accountability, people's coping strategies, and impacts on vulnerable groups. For example, the assessment found that affected communities had experienced severe disruptions to livelihoods, with farmers and small-scale businesses being particularly affected. Disaster survivors had begun to take up unskilled work where available, with evidence also found of negative coping strategies and of an increased debt burden for households. Communities also lacked information about potential sources of assistance and about the reconstruction efforts.

Based on the assessment findings, a set of reconstruction interventions was developed and incorporated into the PDNA report. These included both short- and long-term measures, such as cash transfers for vulnerable groups, community block grants to establish basic services, and trauma counseling for severely affected individuals. The PDNA further stressed that further reconstruction activities and, where necessary, relocation of affected households be carried out in systematic consultation with communities.

Source: World Bank staff.

6.10 Discussion Questions for Section 6:

In the immediate aftermath of disasters,

i. How can social impacts analysis be integrated in PDNAs and used to develop recovery and reconstruction programs?
a. Who is best suited to lead the social impact analysis?
b. How should findings be used to develop programs (working across sectors and focusing on the needs of vulnerable groups)?
ii. What are the best ways of dealing with sensitive issues during social impacts analysis, such as
a. the rights of vulnerable groups and their protection, or
b. political manipulation of relief and reconstruction?

How should information be collected and analyzed? How should actionable measures be proposed?

Monitoring reconstruction programs

i. How can social impacts monitoring be used to assess the effectiveness of recovery programs?
ii. How can findings be used to inform corrective action on programs and projects that are not achieving desirable results?

7. THE WAY FORWARD – TOWARDS AN M&E FRAMEWORK

We have seen why monitoring and evaluation frameworks have lagged in reconstruction programs when compared to conventional development projects. This is due to the expedited nature of project design and implementation and fast-changing and dynamic realities on the ground. However, this is an unsustainable situation going forward. With the increasing frequency and scope of disasters, reconstruction programs will overtake or replace conventional development programs in many disaster-affected countries. This has already happened in a few, and may become the norm in the future.

The development community thus needs to be prepared with agreed-upon tools and frameworks to bring reconstruction programs on par with established and conventional development interventions. Putting in place effective reconstruction programs and interventions will also depend to a large extent on the ability of government institutions and development partners to accurately assess the social impacts of disasters. As highlighted in a number of the examples presented in this session, social impacts analysis plays a critical role in identifying effects of disasters that would not otherwise be recognized. Ensuring that social impacts analysis is a standard feature of PDNAs and informs the development of reconstruction programs is expected to enhance the quality of disaster response and recovery.

In addition, it is important to strengthen monitoring and evaluation frameworks in such programs, learning from good case practices with M&E tools as well as our collective set of experiences accounting for the differential nature of post-disaster environments. A strong, well-established, and consensus-driven M&E framework and toolkit for reconstruction programs will allow us to better assess the impact these programs are having in putting countries back on their feet after disasters. To be able to regularly measure and evaluate these impacts will allow practitioners to respond to fluid conditions in post-disaster conditions with more confidence and accuracy, and enhance the quality of programs and interventions. This will also allow for crucial mid-course corrections to enhance or modify the scope and development objectives of these programs.

Agenda for World Reconstruction Conference – An M&E Toolkit: With this in mind, the development community needs to utilize the unique opportunity provided by the World Reconstruction Conference, where leading practitioners in this field are coming together. This provides us with a platform to make tangible gains in developing an M&E toolkit for reconstruction programs that is standardized and globally accepted – a ready-made toolkit for implementation whenever a reconstruction program is begun in a disaster-hit area. This toolkit will ideally be customizable based on the unique characteristics of each disaster: disaster type, disaster scale, country realities, existing governance and accountability structures, etc. At the same time, while customization should be part of this toolkit, it will also aim to provide a level of uniformity that ensures that all post-disaster M&E

systems meet at least the minimum globally accepted standards of conventional M&E systems in development programs. This will help us achieve the aim of mainstreaming reconstruction programs into the development agenda.

At the Conference itself, leading practitioners, policymakers, academics, and other stakeholders can define in broad terms what this M&E toolkit should include, agreeing on its conceptual design and solving issues of standardization across institutions. Post-WRC, downstream work can be continued in extensive background research and stakeholder consultation to finalize the toolkit in time for the World Reconstruction Report to be published in 2012.

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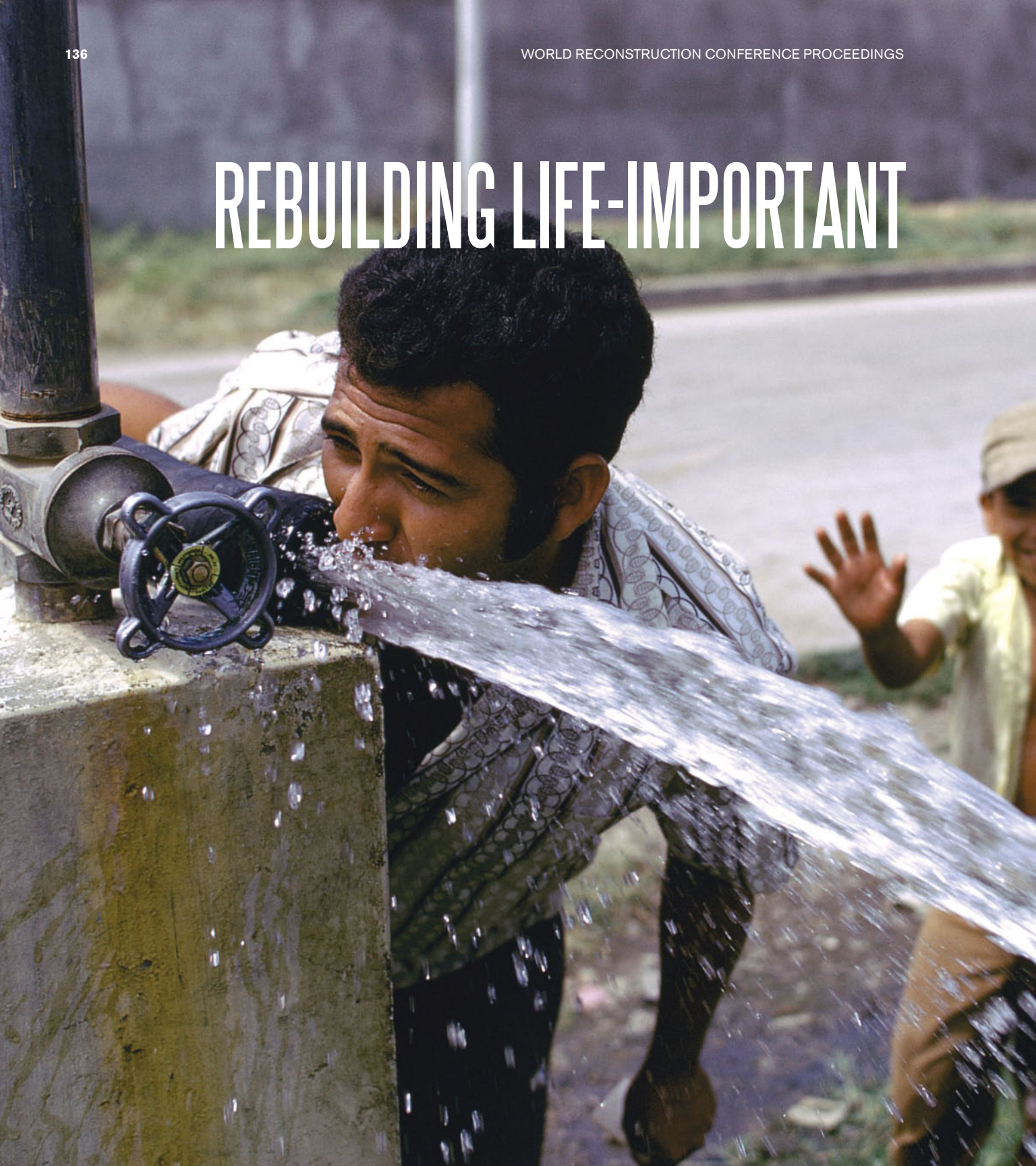
REBUILDING LIFE-IMPORTANT



INFRASTRUCTURE: THE CASE OF WATER AND SANITATION

by Alexander Danilenko and Abel Mejia

1. INTRODUCTION

Providing water and sanitation services with minimum interruptions and quick, effective, and efficient restoration of services provided by damaged water and sanitation infrastructure is a primary concern to decision makers in charge of post-disaster development. Extensive damage of water and wastewater systems in absence of a strategic framework for effective and efficient restoration of services may compromise the entire post-disaster response effort and affect the delivery capacity of other essential social services and infrastructure systems: operation of sustainable water infrastructure is a prerequisite for the operation of a whole spectrum of social services from education and health care to the government and society as a whole. In addition to obvious water-related problems caused by damaged water infrastructure, such as inadequate access to water and wastewater services, the poor water infrastructure may result in unwanted displacement, reduction of labor force, abandoning of homes, and even reduction of educational opportunities. Chaotic and ad hoc rehabilitation of water infrastructure, on the other hand, could be highly ineffective to restore and sustain water and sanitation services efficiently, and it may even result in aggravating environment degradation, over-exploitation and pollution of damaged water resources, and destruction of fragile ecosystems.

Sustainable water infrastructure is a prerequisite for the operation of a whole spectrum of social services from education and health care to the government and society as a whole.

This discussion paper focuses on two questions: 1) how to restore and rehabilitate water supply and sanitation (WSS) services after a natural disaster; and 2) what is needed to maximize the long-term development impact of donor assistance. The discussion is based on the perspective of staff and practitioners associated with the experience of the World Bank (WB) in WSS sector development and disaster response. It examines recent evidence of implementing post-disaster assistance projects in the WSS sector and also takes advantage of interviews with front-line practitioners that are directly involved in current WB projects related to natural disasters in China, India, Bangladesh, and Peru.

The document attempts to contribute to the ongoing debate about possible strategies to move more effectively from post-disaster response, which is mainly related to relief operations, rehabilitation of damaged assets, and restoration of WSS services, to a full-blown development assistance framework of the WSS sector. It discusses policy and investment trade-offs specific to the WSS sector that could be considered when moving from a short-term disaster response framework to long-term development assistance that may require different financial and technical instruments. It is also argued that doing it right, at the right time, and in the right sequence, could avoid costly mistakes, speed up the process of sustainable sector development, and reduce the misuse of resources.

Presentations during the conference session will cover technical aspects of water system rehabilitation, and will touch on issues such as how to limit distorted incentives present during the reconstruction process. Special attention will be paid to the roles and responsibilities of the local population and local authorities, capacity building, transfer of ownership to local authorities, and exit strategies for donors. Case studies from Bangladesh, China, and Peru will illustrate the challenges and paths taken to overcome them.

2. SCOPE AND TRADE-OFFS IN POST-DISASTER ASSISTANCE TO THE WSS SECTOR

2.1. Why Is Urban Water More Complex and Difficult than Other Infrastructure Sectors?

Using water resources and delivering water services is much more complex and difficult than other infrastructure services that are basically static. Water flows in space and in time. It is rain, runoff, rivers, lakes, and coastal water; but also groundwater, ice, and snow. Water services supply cities, irrigate crops, transport and dilute waste, and are an indispensable input for industrial production and power generation. At the same time, water gets polluted and its excess and shortages have large impacts on human activity. Above all, water is essential for life and livelihoods. As a consequence, understanding the complexity of hydrology and the multiple demands for water services is essential for post-disaster recovery efforts, because they are all interconnected in one way or another through the water cycle.

The main natural disasters affecting the integrity of WSS systems are earthquakes, floods, hurricanes, and landslides. However, droughts, fires, and volcanic eruptions can also disrupt WSS services. Natural disasters can inflict total or partial destruction of intake, conveyance, treatment, distribution networks, tanks, and reservoirs. They can also interrupt electric power transmission lines, sub-stations, emergency plants, and transformers. Communications and access routes can be damaged, affecting normal operations of WSS services. The broken system can be vulnerable to water quality at the source, and affect yield and quality of groundwater. Sediments, ash, debris, and trash can block pipes and collectors, and obstruct pumps and valves. Electric panels, actuators, instrumentation, and control devices can be easily affected even in minor emergencies related to natural disasters and defective human operation. Natural disasters also destroy the water supply and sanitation assets of houses, health, education, and community facilities with generally a huge negative impact on environmental health and overall well-being of the affected population.

Similarly, cities are where world population is growing and the locus of where disasters are the most complex to mitigate and manage. Experience has shown that minimizing the effects of disasters upon cities cannot be achieved through the application of engineering approaches alone. As cities and settlements need to be safeguarded from further devastating losses, the concept of sustainable development offers a valuable framework for integrating disaster risk reduction with other social and environmental goals—before, during, and after a disaster.

Cities are where world population is growing and the locus of where disasters are the most complex to mitigate and manage.

Restoring urban WSS services where post-disaster setups and risks of natural disasters have a potential for larger infrastructure damages and higher social and economic costs requires a systemic approach. Conversely, in rural areas and in small towns, while natural disasters can also have devastating effects on WSS systems, they tend to be less complex technically and institutionally, and post-disaster assistance can be approached with local solutions that are more dependent on accessibility, local government's leadership, and community mobilization and participation.

The infrastructure systems of WSS utilities have separate water supply and sanitation systems. The water supply component consists of controlled water sources (surface and underground), intake facilities and wells, conveyance systems, water treatment plants, and the water distribution network. In turn, the water distribution network is composed of pressurized mains, distribution and service pipes to individual connections, water meters, pumps, reservoirs, and valves. The sanitation component consists of individual connections, sewer pipes, collectors, interceptors, wastewater treatment plants, pumping stations, and final disposal facilities including sludge.

Sanitary zones and security of clean water are extremely important during the entire period of rehabilitation of the water services. Chlorination of the treated water, prevention of cross-contamination of clean water by uncontrolled sewage, and protection of the water table are extremely critical. Unfortunately, recent events in Haiti, where by March 2011, some 4,672 people had died and 252,640 cases had been reported from the cholera outbreak (BBC News Online, 2011), just confirmed the importance of proper protection of tap water during rehabilitation work. Sanitary zoning

must be addressed and maintained as some parasites propagating in sewage, e.g., Cryptosporidium, escape water treatment, as chorine does not kill them.

With their large networks and pumping requirements, WSS utilities are heavily dependent on electric power and have transportation, communication, and data processing operations that should be kept functional after a natural disaster. In addition, management, operational staff, and administration functions are essential to keep and restore operations of a WSS utility affected by a disaster.

In addition to the public components of WSS systems, there is a private part of the WSS system, which is associated to housing. It consists of service distribution lines from the water meter to the house or apartment, the internal plumbing, toilets, hygiene, and washing facilities, and the outlet connection to a sewer pipe. These private components of the WSS systems are indivisible from shelter and housing solutions and in many cases represent one of the largest costs of damage of WSS systems related to a natural disaster. To keep a balanced perspective, the cost of the private component of the system could be from hundreds of dollars for simple systems to several thousands in individual houses and apartments.

2.2. Who Are the Most Affected?

WSS services are generally heavily disrupted by natural disasters with large and long-term impacts on the well-being of the population, particularly of the most vulnerable—the poor, women, children, and the elderly.

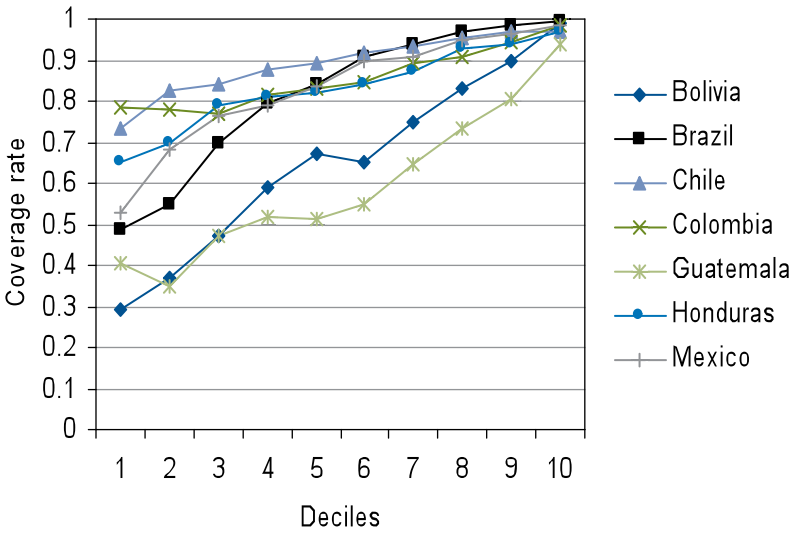
The potential impacts of natural disasters on WSS systems (Table 1) are commonly assessed for the urban population that is formally connected to WSS utilities. However, the impact and the assessment of the same disaster is much different for those living in cities in conditions of deprivation, in slums, in precarious housing without legal titling, and without a formal connection to the WSS networks. The destitute urban inhabitants are generally the most affected by disasters, in part because their WSS services are already substandard and under a quasi-emergency condition even before the disaster. In addition, the poor are inherently vulnerable because of their low income levels and the lack of social support systems to cope with disasters.

Table 1. Potential Impact of Natural Disasters on WSS systems

Potential Impact of Natural Disasters on WSS Systems	Earthquake	Floods	Hurricane	Landslide
Structural Destruction	Severe	Severe	Severe	Severe
Rupture of Pipes	Severe	Severe	Minimal	Severe
Obstruction Intake, Treatment, Conveyance	Minimal	Severe	Minimal	Moderate
Contamination of Water Supply	Moderate	Severe	Severe	Minimal
Disruption of Power, Communications, and Roads	Severe	Moderate	Severe	Moderate
Destruction of Houses	Severe	Moderate	Moderate	Moderate
Interruption of Operations	Severe	Moderate	Minimal	Minimal

WSS services in cities of the developing world are heavily differentiated by income levels (Figure 1). Higher income brackets have not only higher coverage levels, but service quality that is more comparable with those of developed countries. At the same time, low-income populations which are not covered by WSS services are heavily dependent on standpipes, illegal connections, and water vendors. Recognizing the differences between the population and parts of the city receiving regular utility services and those that do not is critical to make realistic post-disaster assessments and then frame the most effective and equitable responses to the disruption of WSS services after a disaster.

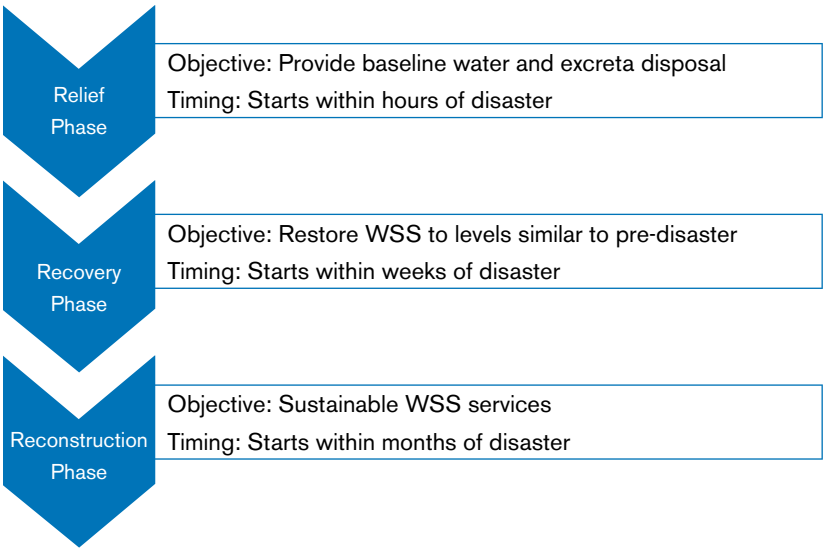
Figure 1. Water Coverage and Income Level



3. RESPONDING TO DISASTERS

The WSS sector provides essential services that should be restored quickly to support a healthy and productive life (and reduce poverty) but at the same time is a core infrastructure sector of the economy with a high priority to resume economic growth and sustain social development. The connection between short- and long-term assistance to the WSS sector can be improved through policy, institutional, and investments decisions that can be initiated and implemented within a post-disaster assistance framework but with large impacts on long-term sustainability. Responses to natural disasters for the WSS sector can be seen in three overlapping and synchronized phases with different objectives (Figure 2).

Figure 2 . Water Systems Rehabilitation Process



3.1. Relief Phase

The relief phase is generally defined by the humanitarian support that is provided to guarantee lifeline WSS services that start hours after a natural disaster and it can last weeks, months, and even years. The duration of the relief (emergency) phase depends on the severity of the disaster and the response capacity to build permanent shelter and move into the restoration of regular WSS services to a level comparable to that prior to the disaster. This type of post-disaster assistance of WSS services is better provided by local governments assisted by community associations and NGOs.

The immediate objective for water supply service in the post-disaster relief phase is to provide good quantities of water of drinking quality and protect water sources to minimize the risk of contamination. A minimum of 3 liters/person/day is required for drinking and an overall 10 liters/person/day should be provided. Additionally, storage capacity should be made available to the city for a few days of supply. Water quality is monitored regularly to avoid

outbreaks of water-related diseases. Water could be piped through existing systems or trucked to ensure supply. Existing treatment facilities should be rapidly assessed for emergency operation while other sources (including bottled water) are considered. The water supply of health, education, and community facilities should be supplied with priority.

In relation to sanitation, the immediate objective in post-disaster assistance is to isolate and contain human excrements. The main concern is how to prevent major outbreaks of diarrheal diseases by controlling defecation practices and managing human waste. Latrines of different types are generally installed and properly sited. The special sanitation needs of vulnerable people (e.g., children, women, and the elderly) should be considered. Management of solid waste, including hospital and commercial activities (markets, food vendors, etc.) and local stormwater drainage systems should be considered all together to meet the sanitation objectives of the relief phase of the post-disaster assistance.

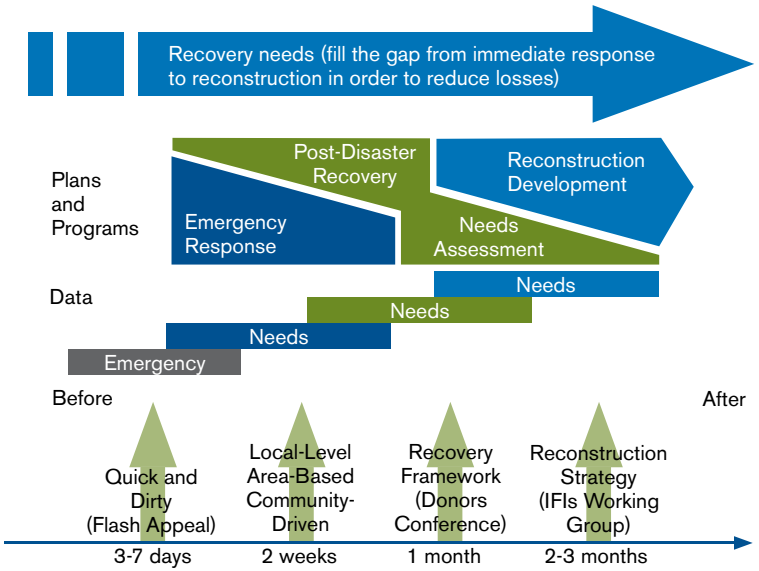
The Post-Disaster Needs Assessment (PDNA) and the Recovery Framework (RF) developed by UNDP[1] are the gold standards used by countries and international agencies to structure a comprehensive post-disaster response. These standards are instrumental to assess the overall impact of a disaster as well as to outline a comprehensive framework for recovery and long-term risk and disaster management. The PDNA is the combination of two methodologies that have been used by the UN for decades in response to demands to standardize the assessment of the effect of natural disasters and the estimation of needs for recovery. These methodologies are the DaLA (Damage and Loss Assessment) of the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) and the HRNA (Human Recovery Needs Assessment) of the United Nations for recovery needs at the community level.

The PDNA is also a key operational instrument to facilitate the coordination of multiple institutions by building a coherent vision to guide post-disaster recovery, construct a framework of actions and priorities for a short period (2-3 years), and outline a longer development time frame of five years or more. It is also instrumental to consolidate a proposal to be discussed by the government

[1] UNDP (2005).

and international donors to fund the post-disaster recovery strategy. Generally, a Donors Conference is organized within weeks (generally in about one month) of the disaster to discuss the assessment of damages and economic losses and agree on the recovery process moving forward, including pledges of resources for bilateral and multilateral financial assistance (Figure 3).

Figure 3. Post-Disaster Needs Assessment Process

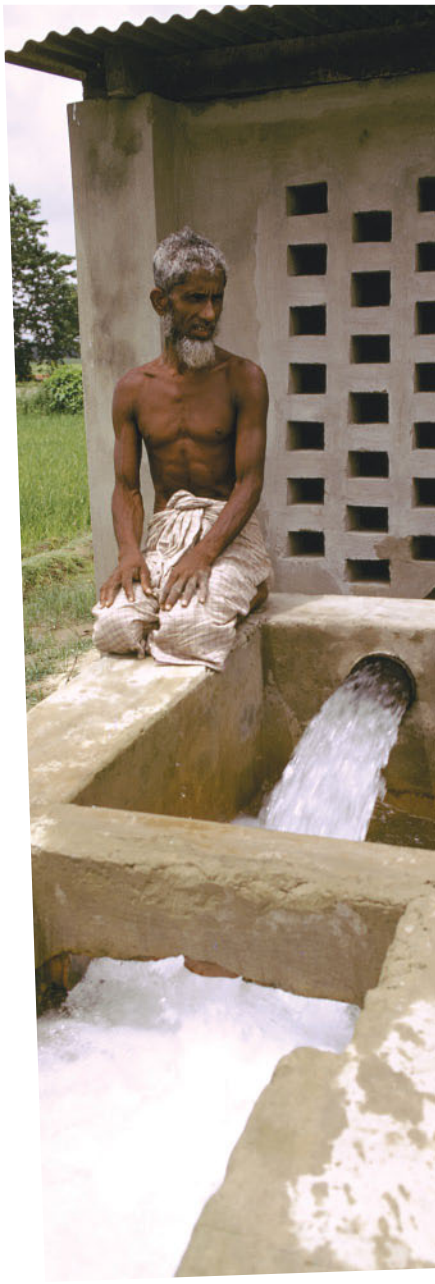


Source: UN-ECLAC, R. Zapata – Focal Point on Disaster Evaluation

The PDNA approach has become the de facto global practice for countries affected by natural disasters, including China, which is possibly the most affected by natural disasters in the world. China has a system in place that allows for rapid mobilization of resources from different parts of the country that has proven to be quite effective in post-disaster response. At the other extreme, small and poor countries like Haiti (which do not have the internal resources and procedures in place to respond to disasters by themselves) are heavily dependent on international help. In both cases, however, the PDNA has become a key instrument to structure post-disaster assistance to affected regions and sectors as well as to provide direction for longer-term reconstruction and development.

The DaLA methodology is used to assess the damages and losses caused by a disaster by estimating the value of assets destroyed (damage assessment) and the indirect impacts on economic flows through loss of assets destroyed and impacts on economic performance (loss assessment). Damage is defined as the monetary value of property wholly or partly destroyed. Losses are defined as being the changes in the flow of goods and services which will not be supplied until the destroyed assets have been rebuilt. DaLA is also used to estimate the financial needs for reconstructing and rehabilitating specific sectors of the economy (including WSS) and the worst-affected regions and populations who will require care during the phase of immediate recovery, reconstruction, and rehabilitation. Needs assessments are also used as a quantitative indicator in monitoring and assessing recovery programs.

The HRNA methodology is used to produce a detailed analysis of communities' short-term needs and an action plan to be implemented over a period of 12-36 months. Priorities are defined to respond to the most pressing needs around priority themes defined by the government. The HRNA is followed by the RF which offers the opportunity to build a consensual, coherent, and concrete view of the actions to be undertaken in order to respond to the immediate recovery needs over a period of 12-36 months.



3.2. Recovery Phase

The recovery phase is about restoring WSS services to levels that are comparable to the condition prior to the disaster. It includes water supply (of drinking quality) to meet demand of end users in the city regardless of whether or not they were connected to the network prior to the disaster. Similarly, restoring service of the sewerage network is important in areas of the city connected to the network, as well as in those with decentralized sanitation and individual excreta disposal solutions. This phase should be initiated in the shortest period of time after the disaster in order to commence the transition from the relief phase (emergency) to regular services. The recovery phase generally lasts for several years (usually 2-3) depending on the damages to WSS facilities, the organizational capacity, and preparedness of the WSS utility, and

more importantly, the extent of damages inflicted on housing, including the imperatives of changing land use and relocating population to safeguard both population and infrastructure against similar disasters in the future.

The PDNA provides a rapid and comprehensive inventory of damages and needs of WSS systems and condition of services; but it also helps to shape priorities with reference to what should be done first and how. From the outset, it is key to define the approach to be followed for different WSS service end-users (formal, informal, institutional, industrial, etc.) based on envisioning the type of WSS services in different parts of the city prior to/after the disaster (by income level, regular and informal service, hours of supply, etc.).

Clarity about the objectives and results to be achieved in the recovery phase is key to define priorities, and common sense strategic guidance is needed to achieve goals like the following:

- Ensure protection of water quality at the source and quality of treated water at standards defined by the country regulations;
- Reestablish water supply at the city gate at pre-disaster levels or at 100 liters/person/day of current population; isolate and repair major water leaks;
- Ensure quantity and quality of water supply for population not connected to network;
- Ensure storage of treated water within the city for at least one day of peak demand for water supply;
- Reestablish functioning of management, operational, transport, communication, data processing, and administrative systems of utility to pre-disaster levels;
- Repair, rehabilitate, and replace mechanical equipment (pumps and valves), electric, and control systems to improve operational control of the distribution and sewerage network (flow and pressure);
- Repair, rehabilitate, replace, and expand power supply systems, including back-up capacity for emergency operations;
- Clean, repair, and rehabilitate buildings and civil works with structural damage that compromise safety and constrain restoration of operations;

- Inspect, clean, and rehabilitate sewer collectors and interceptors, and drainage network to restore hydraulic capacity;
- Update cadastre of users, inventory of assets, and create GIS system to manage operational and service information;
- Reestablish and improve collection and disposal of human excreta, solid, and hazardous waste in controlled landfill;
- Repair, improve, and maintain local drainage infrastructure and natural channels; and
- Provide strong support to hygiene and behavioral change programs including hand washing, water storage and manipulation, and operation/maintenance of defecation/sanitation facilities.

The recovery phase can be messy and frustrating, with multiple and poorly coordinated interventions. Therefore, it is absolutely required that it has not only clear objectives and measurable results, but also well-defined accountabilities. Ideally, the recovery phase should be seamlessly connected with the comprehensive framework of the reconstruction and development phase that should be prepared and initiated in parallel with the recovery phase.

For implementing the recovery phase, the PDNA is the starting point to set a plan, guidelines, and procedures to be followed by all participating agencies and groups under the overall coordination of a lead agency. Specifically, recovery needs effective coordination of housing reconstruction, land use control, and restoration of WSS and electric services for end users. Such coordination is also required for relocation of population and implementation of risk reduction strategies (mitigation).

The engineering and construction specifications to repair, rehabilitate, and replace damaged WSS infrastructure should follow a consistent set of standards and technical specifications to avoid a disparate use of different norms. The size of interventions also matters much to define discrete actions that are simple and implementable in months. Special attention should be given to standardize specifications and cost analysis for repair and rehabilitation of WSS systems since cost would be higher than in normal situations, but the misuse of resources and opportunities for corruption should be minimized.

As a general criterion to guide repair and rehabilitation efforts, they should be specified at the lowest cost, while building better in terms of materials, equipment, and with special attention to risk factors related to disasters, and by avoiding locking in technology decisions for a period of 10 years or more without a proper engineering and economic analysis of alternatives.

3.3. Reconstruction Phase

The long-term goals for the reconstruction phase are generally outlined as part of the vision of the WSS sector that is built into the PDNA process. It is also expected that reconstruction and recovery should be carefully defined, sequenced, and synchronized to avoid duplication, and to maximize benefits and development impact. For instance, while recovery efforts are about the emergency of restoring WSS services in the fastest way, reconstruction has the ultimate objective of providing sustainable WSS services. Experience shows that improving WSS services is a long-term process that requires political will, patience, and persistence, and should be supported by sound analysis to inform decision making. Therefore, the reconstruction and development phase would be seen with a time frame of 10 years or more, integrating the recovery efforts, but recognizing that the two phases require different types of mindset and skills.

The tools to design and implement the reconstruction and development of urban WSS services are well known by international institutions like regional development banks, bilateral assistance agencies, and the World Bank. These tools generally have a project preparation phase of many months and implementation periods of several years. They include emergency investment projects and regular investment projects. The emergency projects are designed to implement typical recovery phase investments, including repair and rehabilitation of damaged assets, and their implementation is done through simplified procedures of procurement and environmental/social safeguards. The regular WSS investment projects are generally geared to longer-term development objectives, and generally include high-priority and larger investments as well as policy and institutional reforms.

In the case of the World Bank, there are guidelines that spell out the criteria to be followed for project design and the minimum requirements for approval of fiduciary and safeguard procedures. Generally, the documentation for an emergency project is prepared and approved in 2-3 months and has implementation duration of 2-3 years. These projects might include resources to design longer-term investment and review policy and institutional issues.

The sector investment loans (SILs) are the instrument of choice to finance the reconstruction and development phase of post-disaster assistance for the WSS sector. The scope and size of SIL projects are generally discussed with the country every 2-3 years as part of an overall agreement regarding the envelope of monetary and non-monetary resources to be allocated to development assistance. These projects typically require 9-12 months of preparation to conduct the appraisal of the project and obtain the approval of the Board; and five years is the standard duration for implementation. However, SIL projects can be sequenced in a programmatic fashion than can last 10 years of more with specified triggers to launch successive projects. Discussing in detail the requirements of these types of projects would be useful but it goes beyond the scope of this paper, though they are well documented and accessible in the public domain.

In addition, to build a sound basis for strategic decisions in the WSS sector, including water utilities, institutions like the World Bank conduct detailed analytical studies that are tailored to specific issues of the WSS sector and in particular to utilities. For instance, one of the analytical tools that has become a global reference to assess utilities by facilitating a significant and rapid analysis is the International Benchmarking Network System (IBNET), custom-made for water utilities of the developing world and with a database of more than 3,000 utilities.

Another important instrument to address broad development decisions that could be used as part of a framework of post-disaster assistance to the WSS sector is the policy loans. These loans are designed to provide budgetary support to governments and they are linked to policy decisions supported

by analytical work and strategy consensus. For instance, this type of instrument could be useful to support regulatory and institutional reform of water utilities, improve water resources and disaster risk management, and create the basis for specific regulations like those governing standards for basic services and land use. Finally, a variant of this instrument is contingent loans that would be triggered in case of a natural disaster based on a pre-defined agreement.

SUMMARY

Post-disaster assistance for the WSS sector should be seen as a continuum of decisions and actions. It starts from lifeline water supply and excreta disposal, restoration of services similar to pre-disaster levels, and then moves to reconstruction and sustainable sector development. It should consider the complexity of the water cycle, the income differentiation of WSS services in urban areas that affect the most vulnerable groups disproportionately, and the long-term nature of institutional reform of the WSS sector.

The PDNA process is the gold standard of post-disaster assessment. It provides a robust framework for recovery of WSS services and guides long-term development. International development agencies have an arsenal of instruments to assist countries in post-disaster assistance, but the actions should be well sequenced and synchronized to move fast from emergency to development and to maximize the welfare of the affected population.

Win-win opportunities can be captured for enhanced post-disaster assistance. The speed of recovery and reconstruction in post-disaster assistance can be enhanced by improving the coordination and synchronization of actions and investments between the different phases. Some of the opportunities identified in this paper are:

- Build well, at the best possible standard, not only the public part of the WSS system, but also by creating incentives for the private sector. In particular, the house connections, which are frequently a weak link of

WSS systems, need coordination with land and housing reconstruction efforts. If possible, install water saving devices and instigate a policy of water conservation from the beginning.

- Collecting WSS information using the latest technology is cheaper and can be used throughout the entire post-disaster process and development phase. For instance, use geo-referenced information and GIS systems to understand service issues, build a cadastre of users, and make an inventory of conditions of operational assets and technical systems.
- Invest in programs of behavioral change (like water disinfection and hand washing) that are among the most cost-effective strategies to improve environmental health by reducing the burden of water diseases.
- Sanitary zoning and protection of drinking water resources must be maintained from the first day of relief phase.

Sanitary zoning and protection of drinking water resources must be maintained from the first day of relief phase.

Measurements of performance are essential to making sound decisions. Installation of flow, pressure, and quality measurement devices and laboratory equipment is a high-return and relatively low-cost investment that not only ensures quality but also improves the entire process of post-disaster assistance while helping to gain operational control of the WSS system.

Provide energy back-up early in the process, since most WSS systems are heavily dependent on electricity. Make a decision about the needs of repair or replacement of equipment, considering age and residual life. For instance, as a rule of thumb, it might be advisable to replace electric and control equipment older than 10 years, and mechanical equipment older than 25 years.

Inspection, flushing, and cleaning up pressured and gravity conduits might be essential to restore their hydraulic capacity which should be key to restore or even improve water, sewer, and storm water drainage services.

Technology matters. It is not advisable to make decisions that lock in technology solutions without an analysis of alternatives. For instance, the decision about centralized and decentralized systems for both water supply and sanitation should be assessed within a framework of 25 years or more in mind.

The decision about centralized and decentralized systems for both water supply and sanitation should be assessed within a framework of 25 years or more in mind.

Bottling water should be regulated to ensure quality and competition. With existing technology, it is possible to produce high-quality purified water at less than one dollar per cubic meter. For instance, a small plant of 3,000 cubic meters per day costs about US$4 million, can be installed in 3-4 months, and has operational costs (mainly for electricity) of about US$0.50 per cubic meter.

Finally, in moving forward, ex-post analysis of post-disaster assistance projects and impact evaluation studies would be essential to improve effectiveness and refine methodologies that are in place. This is particularly important for the WSS, since it may be the sector most susceptible to climate change, where adaptation to a more intense hydrological cycle will be imperative.

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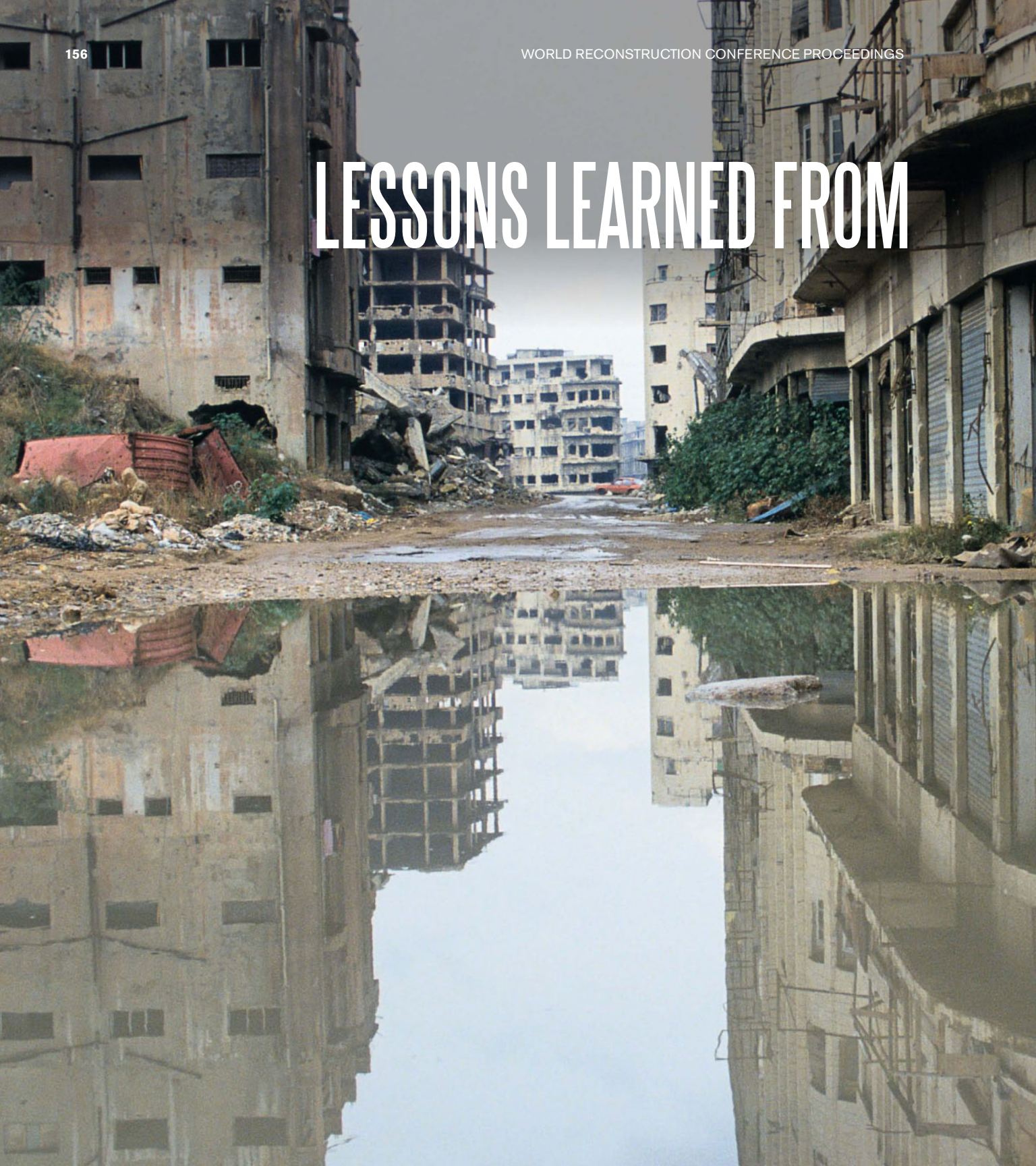
LESSONS LEARNED FROM



LARGE-SCALE RECONSTRUCTION OPERATIONS

Session outline by John Wall

Large-scale reconstruction programs face daunting problems in many ways. Some of these have been the subject of many conferences, reports, and research articles. Nevertheless, some of the most important things to know come out of the experiences of the hands-on managers that usually do not get studied or reported. This session calls upon the experiences of managers of reconstruction agencies in large countries (China, India, Indonesia, Pakistan, and Colombia) that have dealt with major disasters. The lessons they have learned are not abstract; they are the outcome of dealing with ground realities and overwhelming problems.

The session will spend most of the time in a panel discussion among and between the five panelists, structured to bring out a variety of lessons learned in managing large-scale reconstruction programs. To introduce the panelists, their country cases, and a first round of observations, each panelist will be asked to make a 5-minute presentation of lessons each has learned that may be of use to others dealing with large-scale reconstruction. To focus the presentations and discussion a bit, the panelists have been asked to consider some problems common to most disasters to find any valuable lessons they have learned. The starting categories are below:

- The chaos of a major disaster disrupts not only physical infrastructure but also normal channels of communication. Managers have to find quick, effective ways to get timely and reliable information to plan and act.

- High-visibility disasters elicit a tsunami of help that needs to be coordinated to avoid adding to the chaos and put to good use. Managers have to sort through the many offers of help, establish a strategy and priorities, and facilitate the application of this help.
- Large-scale physical damage of public and private assets usually reveals mistakes made in the past—at least in seeing the damage done—in the locations and construction of these assets; and this leads to questions of how and how much the rebuilding of these homes, shops, farms, roads, bridges, and public buildings can avoid these mistakes in the future. Managers have to see the trade-offs between higher standards, rebuilding capacity, costs, and time.
- Natural disasters always raise questions of how such damage could have been avoided. Managers have to turn this question into constructive programs to embed in future plans the prudent steps to prevent damage from disasters from becoming so large-scale.

The panelists have been asked the following questions to prepare:

1. How you found the information and policy guidance to design and implement a reconstruction program.
2. How you dealt with offers of assistance - both official and non-government.
3. How you handled issues of standards of reconstruction, such as “build back better.”
4. How you introduced improved disaster risk management into the reconstruction program.

After the introductory presentations by each panelist, the session leader will moderate an hour-long panel discussion on these questions and on other lessons learned that arise from the discussion. The discussion is expected to be interactive, with the panelists contributing their experiences and building on each other’s insights. The audience will be invited to ask questions and comment. The chair will provide a brief summary at the end.

ENVIRONMENTALLY

SUSTAINABLE RECOVERY

by Michael Samways

1. INTRODUCTION AND BACKGROUND

Major disasters, from earthquakes to floods to tsunami, have captured global attention over the past few months alone. Economic progress around the world is creating increased concentration of physical infrastructure, making it vulnerable to natural hazards, while population pressure is pushing development and settlements into more and more vulnerable places. At the same time, old and new forms of media communicate news of disasters in real time to an audience around the world. Also, in an inter-connected world, a disaster occurring in a far corner of the world has practical implications in other parts far removed from the disaster, whether in humanitarian or economic terms. Thousands of people from European countries died in the 2004 tsunami which took place in Southeast Asia. Millions of households around the world will feel the economic consequences of the 2011 tsunami in Japan, if disrupted supply chains continue to hinder the production of Toyotas and thousands of other products. The obvious enormous environmental impacts of such disasters, and the less obvious but important impacts of reconstruction programs, are thus key topics for the World Reconstruction Conference.

2. ENVIRONMENTAL VULNERABILITY AND DISASTERS ARE INTER-LINKED

There are multiple linkages between disasters and environment. The first is that environmental vulnerability influences the extent of disasters. A natural hazard, such as earthquake or flood, can turn into a disaster when the impacted environment is already degraded. The amplification power of degraded environments

to convert a natural hazard into a humanitarian tragedy has been demonstrated in multiple countries and in many contexts, but most particularly in countries exposed to recurrent disasters, such as Haiti, Pakistan, Madagascar, and central and southern Africa: deforested hill slopes are more easily destabilised during an earthquake. Urban development that reclaims wetlands for settlement purposes eliminates their buffering capacity against floods and puts people and economic assets at risk. Destruction of coastal ecosystems such as mangroves reduces natural barriers against storm surges. Environmental degradation is one of the key factors why, over time, recurrent extensive disasters can eventually become intensive in cumulative impact.[1]

The second, and most evident link is that major disasters - whether related to natural hazards (e.g., floods, earthquakes) or technological hazards (e.g., oil spills) - can have serious primary impacts on the environment. Disaster impacts can also be secondary, whereby the immediate response to the disaster causes negative environmental impacts, or even tertiary, where the impacts are felt in locations far removed from the disaster-affected area. Examples of secondary impacts include inadequate sanitation in temporary camps created after a disaster (e.g., in Haiti) or from more protracted conditions that force affected communities to unsustainably "harvest" natural resources (e.g., firewood) to meet their basic needs. Tertiary impacts may occur when coastal communities decide to move upland after major cyclones, encroaching on farmland or forests. Conversely, after an earthquake, communities living uphill may decide to settle in the valleys or plains.

Post-disaster reconstruction therefore leaves a significant environmental footprint if one considers both secondary and tertiary environmental impacts. Its footprint may even extend beyond borders, as the need for reconstruction materials exerts pressure on the supply chain. For example, the demand for wood to rebuild fishing vessels in India may cause deforestation in Indonesia, or the need for steel following an earthquake in Asia may result in unsustainable mining for iron in Africa.

[1] United Nations (2009).

Table 1 shows in schematic form the interconnections between environmental vulnerability and disasters.

Case Study 1. Monsoon Floods in Northwest Pakistan, July-August 2010

Pakistan experienced extraordinary monsoon rainfall in mid-July 2010, which continued until September 2010.The result was unprecedented floods affecting large parts of the country. The floods have been assessed to be the worst since 1929, affecting 84 districts out of a total of 121 districts and more than 21 million people, and devastating villages from the Himalayas to the Arabian Sea. More than 1,700 men, women, and children lost their lives, and at least 1.9 million homes have been dam or destroyed. More than 6.2 million acres of crops have been ruined and two millio bales of cotton lost. In flood-affected areas, more than 70 percent of roads and bridges have been damaged or destroyed.

Deforestation in upper parts of the river valleys increased the run-off rate while building close to the river in lower reaches increased the vulnerability. In addition, intensive irrigation development of the Indus Basin over the past many decades has withdrawn the great bulk of the annual flow, so that the branches often do not reach the sea. A consequence is that the river normally lacks sufficient flows to carry away the riverine sediments, resulting in build-up and steadily reducing the river's capacity to handle large flows. Moreover, the monsoon season coincided with snowmelt in the Himalaya and Karakoram Mountains, while poor catchment management increased severity of flood impact.

Key environmental issues that affect relief and early recovery efforts include mud or silt on agricultural lands, chemical pollution due to released pesticides from storage sites and oil spills, landslides, and disaster waste management. Environment will be integrated as a cross-cutting issue in the humanitarian response. The Pakistan Government has highlighted in particular the need for reusable material to be provided as shelter support where possible.

Source: United Nations Disaster Assessment and Coordination (UNDAC) (2010).

Table 1. Typical Linkages between Environment and Disasters	
Earthquakes	
Exacerbating environmental factors	• Topography and type and status of land cover • Building codes and urban planning/urbanization processes
Potential environmental impacts	• Natural gas leaks, household and industrial chemical releases from damaged containers • Damage to industrial facilities resulting in toxic release • Building waste debris and potential mix of hazardous materials
Floods, storms, hurricanes/typhoons/cyclones	
Exacerbating environmental factors	• Habitat and ecosystem destruction (e.g., coral reefs and mangroves) • Deforestation and water siltation • Urbanization and land use/land cover changes • Climate change and variability
Potential environmental impacts	• Sewage overflow and chemical releases from roads, farms, and factories • Hazardous disaster debris – chemicals, medical and other materials • Water-damaged household chemicals (paint, pesticides, solvents); unsafe water supplies • Ground and surface water contamination • Loss of topsoil due to rapid drain of runoff
Forest fires	
Exacerbating environmental factors	• Deforestation and land use/land cover changes • Climate change and variability
Potential environmental impacts	• Loss of biodiversity and ecologically sensitive habitats • Air pollution from smoke and haze
Droughts	
Exacerbating environmental factors	• Urbanization and unsustainable resource consumption (e.g., water withdrawals) • Deforestation and land use/land cover changes • Climate change and variability
Potential environmental impacts	• Habitat and crop destruction • Water scarcity
Landslides	
Exacerbating environmental factors	• Deforestation and land use/land cover changes (e.g., road construction) • Topography/slopes
Potential environmental impacts	Damage/deterioration of habitat ecosystems Land use functions, including agriculture Ground and surface water contamination

Source: Srinivas (2010). To the listed impacts of earthquakes may be added the generation of tsunami, landslides, and urban fires.

3. THE KEY PRINCIPLES OF ENVIRONMENTALLY SUSTAINABLE RECOVERY

Recovery, in the context of this paper, refers to the series of phases and activities after a disaster when the country (community/region) moves from the immediate aftermath of a disaster back into the development trajectory.

While disasters are disruptive in nature, they are also opportunities to introduce new approaches and thinking. This could range from better urban planning to new livelihoods for the community. There are many reasons why an environmentally sustainable recovery is preferred over a "build-back-to-baseline" scenario:

1. It does not recreate the environmental vulnerabilities that existed prior to the disaster and possibly contributed to the disaster, and is therefore an investment in risk reduction and prevention.
2. It assists the reconstruction to be undertaken in a resource-efficient manner, thereby making the recovery more cost-efficient.
3. It takes advantage of the natural defenses provided by ecosystems (e.g., forests, reefs, etc.) against disasters, reducing community vulnerability and making it less costly to defend against future disasters.
4. It factors in modern approaches to environmental planning and management which are more inclusive and precautionary.

Campaigns to "build back better" and "build back greener" are now well-recognized and accepted. However, there are multiple, varying interpretations of what environmentally sustainable recovery means and how it can be achieved. Individual actions of "greening" reconstruction and recovery have been attempted, although it is not always evident that a series of project-based greening initiatives will itself translate to an environmentally sustainable recovery. For example, if the Government decides to rebuild houses using a zero-carbon principle but undertakes the rebuilding in a floodplain, the overall reconstruction cannot be considered to be environmentally sustainable.

It is therefore useful to define what constitutes environmentally sustainable recovery:

1. The underlying environmental risk of the disaster is identified and minimized, to reduce future vulnerabilities and disasters.
2. Relief operations are undertaken in a manner causing minimal environmental impacts. This in particular applies to water and sanitation, cooking fuel, medical and hazardous waste disposal, and camp construction.
3. All reconstruction plans are reviewed from an environmental sustainability point of view and measures are incorporated to minimize or avoid an environmental footprint.
4. No new exposure or environmental vulnerability is introduced into the communities, protecting it against further impacts from the current or future disaster.
5. Natural defenses and buffering capacities provided by natural environmental features or ecosystems are recognized and factored, as appropriate, into reconstruction and recovery plans, and considered alongside other measures to enhance protection and disaster mitigation.
6. All partners agree with the affected Government to follow a set of harmonized procedures for environmentally sustainable recovery, and to monitor their application.

The following section discusses the process of achieving environmentally sustainable reconstruction and recovery in the various post-disaster phases, including common errors and lessons learned from major disasters.

4. PROMOTING ENVIRONMENTALLY SUSTAINABLE RECOVERY IN POST-DISASTER PHASES

Post-disaster activities are generally distinguished according to the following consecutive phases that fall under the broad category of "recovery", before finally linking into the development continuum: rescue, relief, and reconstruction.

While the broad features of what constitutes each of these distinct phases are clear, in operational terms the boundaries are not always distinct. For example, in the case of an earthquake, rescue operations may still be ongoing a week after the event, while relief systems are already in place. In the case of

a flood event in a big country, such as Pakistan, one part of the country may be busy with rescue operations, while the other part may have already moved into relief and recovery.

In order to achieve sustainable recovery, environmental issues need to be integrated throughout all key phases. Environmental concerns, however, are most critical starting from the relief phase to reconstruction, unless the event itself poses an acute environmental emergency (e.g., oil spills, gas leaks, nuclear contamination), whereby controlling the spread of damage during the earliest stages (rescue) is paramount to protect human lives.

4.1 Environmental Issues and Opportunities during the Rescue and Relief Phase

During the rescue phase, affected Governments and partners must rapidly assess the potential environmental impact of the disaster. In developing countries, this is generally performed by UNEP/OCHA using standard Hazard Identification Tools, often carried out on the same day or a few days after the disaster. This is followed by Rapid Environmental Impact Assessments a few days after the disaster (see Annex 1). Depending on the nature of the disaster, further specialized assessments may follow – such as groundwater contamination, asbestos, nuclear radiation, oil spill contamination, etc. During these early stages, WHO also typically carries out a Public Health Risk Assessment, which is also relevant for environmental concerns.

The key challenge to affected Governments and development partners during the early phase is to coordinate well the information from these early assessments and act promptly on any environmental impacts likely to have major consequences for human lives, safety, and health. In general, the most urgent procedures that need to be agreed on at this stage are:

- Disposal of medical waste
- Disposal of hazardous waste

Both of these are regulated by standard protocols and the *Basel Convention Treatment of Hazardous Wastes* (UNEP 1994).

For many disasters, information during the rescue phase is made through a centralized Web page maintained by the Office for Coordination of Humanitarian Affairs (OCHA). It is, however, critically important that this centralized information repository be shared and/or led by a Government Crisis Committee, to facilitate the recovery efforts – particularly those which, like in Haiti, involved a large number of partners.

During the relief phase, several activities aimed at alleviating human suffering may have unforeseen negative effects on the environment that could compromise long-term recovery and development. They include the following:

- Selection of location for relief camps;
- Materials for construction of the camps;
- Management of sanitation, water supply, and solid waste at the camps; and
- Provision of cooking fuel and issues related to air pollution.

Of the above-mentioned activities, waste management and resettlement of affected people can have particularly profound impacts on the environment over the short and long term. Both can generate significant habitat loss or fragmentation and cause pollution, which can hamper recovery. Resettlement can also result in the overexploitation of natural resources, as affected communities living in new conditions search for food, wood for heat and cooking, and natural products to consume or sell for income.

Standard mitigating measures to manage these types of impacts are normally dealt with in the Shelter Centre's (2009) Transitional Shelter Guidelines.

4.2 Environmental Issues and Opportunities during the Recovery and Reconstruction Period

In most disasters, people start rebuilding their houses and livelihoods as soon as disaster strikes, whether or not they have moved into camps and whether or not they have received external assistance. Hence, it is critically important to guide this early reconstruction process correctly. The history of disaster management is paved with costly environmental mistakes when informal recovery was not managed correctly. The principal risks here include:

- Incorrect debris disposal;
- Excessive water abstraction from shallow wells;
- Contamination from polluted water sources;
- Excessive extraction of aggregates and wood for reconstruction;
- Over-harvesting of natural resources;
- Rebuilding of houses in marginal and/or unsafe sites; and
- Lack of coordination amongst relief development partners in the application of environmental procedures.

Decisions on debris management should be made at the very onset of a disaster.

Decisions on debris management – particularly designation of debris collection sites, and whether debris should be separated at origin or transported to intermediary sites – should be made at the very onset of a disaster. Several major disasters, Marmara earthquake (1999) and Aceh tsunami (2004) in particular, attest to the severe consequences of delayed decisions. In Aceh, some 400,000 m^3 of tsunami waste was dumped into fish ponds and rice fields, requiring a US$9 million project and 1,500-2,000 workers to recover the waste. In Marmara, over 90 percent of the original 35 million m^3 of rubble would have been recyclable, but due to weak initial planning, the debris became comingled, requiring expensive secondary sorting.

The management of recovery is made the more difficult by the plight of the affected, the need to provide them with rapid sources of livelihoods, but also by political pressures from both Governments and cooperating partners. As the reconstruction phase begins, many of the key decisions with a potential to influence environmental impacts will have already been taken – by Government, donors, or communities themselves. These include the location of settlements, the materials to be used for reconstruction, and agriculture, water, and energy policies with a potential to influence local resource extraction. The most important environmental challenge faced during this phase is therefore the strong sense of urgency to rebuild. Conventional due diligence processes, such as environmental impact assessments (EIAs), are often shortchanged in the process. Thus, whilst disasters provide great opportunities to strengthen environmental resilience, the way in which reconstruction plans are developed can also provide a great challenge to the environmental sustainability of the recovery process.

At the heart of the issue is partner coordination. Since normal Government's environmental procedures are often inadequate and/or weakened during a disaster, development partners or private actors tend to follow their own procedures – in some cases, none. This is further complicated in disasters like Haiti, where 385 relief organizations had registered with OCHA one month after the 2011 earthquake.

The examples of the Sichuan earthquake (2008), the Aceh Tsunami (2004), Cyclone Nargis (2008), and Hurricane Katrina (2005) show the importance of agreeing early on on a Recovery Framework which takes environmental considerations into account. The example of Cyclone Nargis is particularly noteworthy because it rested on a substantial participatory process. In Sichuan and eventually Haiti and Aceh, the Government adopted a harmonized Environmental Framework to guide the reconstruction, although this did not take place in Aceh until more than two years after the disaster.

Whether Governments decide to adopt a separate Environmental Framework or to mainstream it into an overall Recovery Framework, the key aspect is to do it as soon as possible after a disaster. Sustainable Recovery Frameworks can be adjusted periodically to take on more complex issues as the recovery and reconstruction progresses – but the window of opportunity to act after a disaster is very narrow, and the opportunity costs of inaction can be very high.

It is well known that a natural hazard of comparable intensity results in a larger disaster in a developing country. Part of this is due to the absence of institutional mechanisms to anticipate and respond to disaster risks and disasters per se. This capacity is often further eroded, both financially as well as physically, when a disaster strikes. If sustainable reconstruction is to be achieved, it is critically important that efforts be centered on building the human capacity and institutional systems the country needs to manage it properly. This is true for all sectors, but often even more so for stretched Environmental Ministries. In cases where capacity is lacking, alternative models should be explored – such as, for example, contracting qualified partners paid by a proportion of projects' costs (as it is done in Madagascar).

Case Study 2. Earthquake in Sichuan, China, May 12, 2008

On May 12, 2008, Sichuan Province was struck by an 8.0 magnitude earthquake. The epicenter of the quake was located in Wenchuan County, 80 km northwest of Chengdu, the provincial capital. The disaster affected approximately 70 million people and destroyed nearly 6.5 million homes. Some 15 million people were evacuated, and it is estimated that approximately 4.8 million people were forced to live in temporary shelters. In addition, more than five million farmers lost their harvest. By December 2008, the death toll was over 100,000, with over 374,643 injured and 17,923 missing.

A key feature of the post-disaster recovery and reconstruction in Sichuan was the speed and conviction with which the Government of China responded. UNEP and the World Bank supported the Government in integrating environmental sustainability in its recovery and reconstruction process. As a result, environment was one of the key priorities within the Government's ambitious three-year reconstruction plan, worth some 1 trillion Yuan (US$150 billion). In the early stages of its implementation, UNEP worked with the Ministry of Environmental Protection and local governments to help "green" the reconstruction of damaged and new buildings, while addressing environmental improvements across sectors such as industry, education, and agriculture. At the same time, the World Bank helped the Government develop an "Environmental and Social Safeguards Screening and Assessment Framework." This provided a simple checklist to ascertain whether reconstruction projects needed an Environmental Impact Assessment or a more simplified procedure. From an environmental point of view, three specific areas are worth highlighting:

Centralized camp management: Impacted communities ranging from 5,000 to 20,000 people were moved to large camps which were provided with adequate provisions by the State for key facilities and social infrastructure, such as schools, hospitals, and play areas. From an environmental point of view, this ensured that issues of water supply, sewage, and solid waste could be professionally managed in a centralized fashion.

Planning guidelines for reconstruction: Clear guidance was issued to communities and cities on which areas could be used for rebuilding and which areas should remain untouched. Most importantly, environmental and disaster reduction considerations were built into the assessment, which enabled local communities to rapidly deploy their resources, rebuild their homes where possible, and return to normalcy. As a result, reconstruction activities did not take place in environmentally sensitive or disaster-prone areas, which greatly helped to minimize the impact of future risk.

Pace of reconstruction: Thanks to an innovative financial model (whereby rich provinces were requested to adopt impacted counties) developed by the Government, reconstruction occurred at a very rapid pace. As a result, a significant proportion of the local population was able to return to permanent accommodation over a short period of time. Such a model is an example of best practice, and can be replicated in other parts of the word.

A key feature of the recovery support in Sichuan was the commitment to ensure two-way knowledge transfer, between international experts as well as Chinese authorities who shared best practices in environmentally sustainable recovery. This legacy is a particularly good example of cultivating different and innovative approaches to mainstreaming environment in recovery, which will have a lasting impact beyond the post-disaster reconstruction.

Source: UNEP (2010).

Case Study 3. Indian Ocean Tsunami, December 26, 2004

The 2004 Indian Ocean earthquake was an undersea earthquake, with an epicenter off the west coast of Sumatra, Indonesia. The earthquake triggered a series of devastating tsunamis along the coasts bordering the Indian Ocean, killing over 230,000 people in 14 countries, and inundating coastal communities with waves up to 30 meters high. It was one of the deadliest disasters in recorded history. Indonesia was the hardest hit, followed by Sri Lanka, India, and Thailand.

The Indian Ocean Tsunami was exemplified by the international outpouring of assistance, which allowed all impacted countries to rapidly move into reconstruction. However, in the absence of existing regulation on land use planning and slack implementation of environmental impact assessments and other environmental regulations, reconstruction efforts unfortunately did not take into account potential environmental impacts. As a consequence, large quantities of tsunami waste were dumped in rice fields and fish ponds to give way to construction sites, many households proceeded to drill deep wells and build their own sanitation systems (affecting the aquifers), and excessive quantities of raw materials were used for reconstruction – affecting some 10,000 hectares of forest. Demand for reconstruction materials also resulted in the mining of sand dunes, which serve as natural barriers against storm surges.

In the early days, international donors and agencies put a higher premium on efficient reconstruction than an environmentally sustainable one. This was eventually corrected, and two years after the tsunami, the Indonesian Government adopted a Strategic Environmental Framework for a More Environmentally Sound Reconstruction. One of the positive features of the tsunami aftermath was the international attention received on the role of mangroves in disaster risk reduction. While coastal ecosystems, such as coral reefs and mangroves, are not effective barriers against tsunamis, they can provide mitigating effects against tropical cyclones and storm surges. In this regard, a number of affected countries, such as Sri Lanka, India, Indonesia, Thailand, the Seychelles, and the Maldives, have invested in restoring or establishing mangroves as coastal “green belts,” through the Mangroves for the Future (MFF) program. The MFF program has become part of the longer-term recovery and development strategies of tsunami-affected countries.

Source: TGLLP (2009).

Case Study 4. Hurricane Katrina, USA, August 29, 2005

In August 2005, Hurricane Katrina first made landfall in Florida as a Category 1 storm, but rapidly gained strength as it struck southeast Louisiana as a Category 3 storm. Katrina caused severe destruction along the Gulf coast from central Florida to Texas, much of it due to the storm surge. The most significant loss of lives occurred in New Orleans, Louisiana, which flooded as the levee system catastrophically failed, submerging 80 percent of the city. However, the worst property damage occurred in coastal areas, such as all Mississippi beachfront towns, over 90 percent of which were flooded, with waters reaching inland 6–12 miles (10–19 km) from the beach. Katrina was regarded as the costliest natural hazard and one of the deadliest hurricanes in United States history. At least 1,836 people died in the actual hurricane and in the subsequent floods, with total property damage estimated at US$81 billion, nearly triple the damage incurred from Hurricane Andrew in 1992.

In the state of Mississippi, following Hurricane Katrina, a quick response to establish an early recovery framework was comprehensive and strategic. Seven days after the hurricane, the Mississippi State Governor established the Commission on Recovery, Rebuilding, and Renewal. Comprised of stakeholders from both the public and private sectors, including local and state officials, the Commission established the framework for rebuilding affected areas. The Commission also provided over 240 recommendations on the rebuilding of Mississippi.

Environmental sustainability is a key theme in the strategic recovery document and is inherent not only in land-use planning but throughout the recovery process, affecting transport and utilities, agriculture, forestry, fisheries, and tourism. The following are the key elements:

- Regulating floodplain use by applying zoning codes to steer development away from hazardous areas or natural areas deserving preservation, establishing rules for developing housing subdivisions, and rigorously applying building, health, and sanitary codes;
- Establishing policies on the design and location of public services, utilities, and critical facilities;

- Restoring and preserving the natural functions of floodplains by acquiring land in floodplains in order to preserve open space as flood buffers and permanently relocating buildings as needed;
- Elevating or flood-proofing new buildings and retrofitting existing ones;
- Preparing people for flood events through early forecasting, warning systems, and emergency plans;
- Restoring and preserving the barrier islands and wetlands, recognizing their invaluable functions for coastal protection. These islands and wetlands serve as the coast's primary defense against ocean waves and surge caused by tropical storms and hurricanes by blocking, absorbing, and slowing waves and storm surge.

Progress has been monitored against this recovery framework on an annual basis, indicating a positive shift towards environmentally sustainable development. For example, four years after Katrina, this framework has resulted in permanent housing stocks that satisfy current housing demand and at the same time are located away from environmentally sensitive and high-risk areas.

Source: Governor of Mississippi Commission (2005).

Case Study 5. Cyclone Nargis in Myanmar, May 3, 2008

Cyclone Nargis struck Myanmar on May 2 and 3, 2008, making landfall in the Ayeyarwady Division, approximately 250 km southwest of Yangon, the country's capital and largest city. A Category 3 cyclone, Nargis affected more than 50 townships, mainly in Yangon and Ayeyarwady Divisions. Strong winds and heavy rain caused the greatest damage in the Ayeyarwady Delta, where a storm surge compounded the impact of the cyclone. Nargis was the worst disaster in the history of Myanmar. More than 140,000 people were killed, mainly by the storm surge.

In order to determine the full scale of the cyclone's impact and requirements for both immediate humanitarian assistance and medium- to long-term recovery, a Post-Nargis Joint Assessment (PONJA) was undertaken by the United Nations, the Government of Myanmar, and the Association of South-East Asian Nations (ASEAN). Cyclone Nargis caused major damage to the environment of the Ayeyarwady and Yangon Divisions, an area where local livelihoods are heavily reliant on the natural resource base. Cyclone Nargis destroyed 38,000 hectares of natural and replanted mangroves, submerged over 63 percent of paddy fields, and damaged 43 percent of freshwater ponds. The cyclone's impacts were exacerbated by earlier damage to the environment, including deforestation and degradation of mangroves, over-exploitation of natural resources such as fisheries, and soil erosion. For example, the heavy loss of life as a result of the storm surge was linked to prior loss of about 75 percent of the original mangrove cover in the Delta, which could have served as a buffer against the storm surge.

Although initially the development of a typical emergency response framework was envisioned, the Government of Myanmar and the international community jointly decided to formulate the Post-Nargis Response and Preparedness Plan (PONREPP) to outline a three-year framework to guide recovery efforts. This alternative framework provided the opportunity to address both short-term and medium-term recovery needs across eight development sectors, and therefore

encouraged more strategic thinking in recovery planning. Environment was considered as a cross-cutting issue to be integrated into the other sectors (such as in livelihoods, water and sanitation, shelter, etc.), as well as a stand-alone sector.

The root cause of environmental degradation in the Ayeyarwady Delta is poverty. Unless remedial action is taken to restore and establish sustainable livelihoods, the impacts of Cyclone Nargis will likely increase poverty and, subsequently, contribute to environmental vulnerabilities. One key lesson from Nargis is that ensuring sustainability will require a coherent and integrated approach across a number of sectors, including livelihoods and food security; shelter; education and training; water, sanitation, and hygiene; disaster risk reduction (DRR); and protection of vulnerable groups. While the shift towards a more strategic recovery planning framework was important under PONREPP, only the Forestry Plan systematically incorporated environmental issues. Other sectoral plans did not fully account for environmental concerns or address environmental dimensions of risk and risk reduction. At the same time, these sectoral approaches will need to be augmented by:

- Capacity building and institutional strengthening for national and local governments as well as for civil society;
- An enabling framework at the national level to provide laws and policies that support sustainable development; and
- A reliable information base to monitor environmental trends and conditions.

Source: UNEP/ISDR (2009).

5. THE LONG TERM: BUILDING ENVIRONMENTAL RESILIENCE TO FUTURE DISASTERS

Experience shows that post-disaster situations, though they are tragic, are also opportunities for enabling transformative institutional and behavioral reforms. Attention of the national government and the international community, depending on the scale of the disaster and request for assistance, will be focused on the impacted area, and decisions will need to be made in directing substantial new resources to the area, both from public and private sources. The political climate to make difficult decisions away from "business as usual" and towards sustainable recovery, however, will exist only for a brief period of time, as society is seized by the enormity of the disaster in its immediate aftermath. For example, a government decision to widen coastal setbacks or buffer between the high water mark and infrastructure is generally highly contentious, both in developed and developing countries, given population pressures, urbanization, and high demand for land and oceanfront property. However, in the immediate aftermath of a tsunami, hurricane, or major cyclone, such decisions may become more politically acceptable. This has been the experience of the mangrove belts in the 2004 tsunami, and also the experience of Samoa after cyclones Ofa and Val in the early 2000s.

Achieving environmentally sustainable recovery calls for more than understanding environment-disaster linkages. In order to effectively address environmental concerns in a post-disaster context and integrate these into reconstruction and recovery plans, it is critical to identify both the environmental impacts of disasters as well as the environmental considerations necessary to ensure a sustainable recovery, for instance during the relief or reconstruction phases. Environmental issues identified in post-disaster needs assessments should feed into reconstruction and recovery planning and emergent post-disaster development frameworks. A number of tools now exist to undertake post-disaster environmental assessments as well as to integrate environmental concerns in long-term planning processes and development frameworks (Annex 1).

The case of Myanmar following the devastation caused by Cyclone Nargis is an example of good practice in post-disaster recovery planning and shows

great promise for successfully "building back better and greener" (case study 5). In Bangladesh, previous efforts to ensure that post-disaster recovery from severe floods incorporated environmental concerns as one of several long-term disaster risk reduction measures are now demonstrating positive results. Marked improvements were noted in-between flooding events in 1988 and 1998 and in 2007 following Cyclone Sidr, a Category 4 storm. Lower casualty rates than what would have been expected from such a powerful storm are credited to "improved disaster prevention measures, including an improved forecasting and warning system, coastal afforestation projects, river system restoration, cyclone shelters and embankments."[2]

Building back better and greener

Post-disaster planning should also be able to anticipate and mitigate future disaster risks, including those related to climate change and variability. Given that over the past decade, approximately 90 percent of disasters have been weather- and climate-related, post-disaster reconstruction offers an opportunity to introduce measures to enhance adaptive capacities to climate change and "climate-proof" long-term recovery and development.

Different countries approach post-disaster reconstruction in different ways, depending on the scale of the disaster, the nature of national planning processes, and scope of international assistance. National Governments take the lead in planning and implementation. Government may establish a reconstruction plan, separate from the standard national developmental plan, to focus attention and resources towards reconstruction. In cases where reconstruction is being financed with international support, the international community has the potential to influence post-disaster planning and decision-making. This provides an opportunity to introduce international best practices in environmentally sustainable reconstruction and recovery. However, in many cases, international assistance is not coordinated and often comes with conditionalities, which can circumvent and undermine national decision-making processes and capacities, including, for instance, implementation of national environmental safeguards already in place.

[2] European Commission (2008).

In this regard, just as important as good environmental planning and assessment is continuous monitoring and evaluation of reconstruction and recovery to ensuring that they are contributing to improved environmental sustainability and resilience.

Environmental sustainability must therefore be considered beyond the physical act of rebuilding. Reconstruction decisions must also factor in the possibility of future disasters, including from single and multiple hazards, such as in the case of the 2011 earthquake and tsunami in Japan. There may be instances where the risk is such that the most environmentally sustainable reconstruction decision in a certain location is not to reconstruct at all.

ANNEX I

Examples of Tools that Integrate Environmental Concerns in Post-Disaster Recovery

Post-Disaster Environmental Assessment Tools

- **HIT**
  The Hazard Identification Tool (HIT) is used by the UN system to alert the UN Country Team after a disaster of the potential secondary risks posed by large infrastructure and industrial facilities containing hazardous materials located in the affected area. This information should be shared with local and national authorities. Any actual secondary risk should be addressed at the earliest possible stage.

- **Rapid Environmental Assessment**
  The Rapid Environmental Assessment (REA), an approach pioneered by the Benefied Hazard Research Center, is a tool to identify, define, and prioritize potential environmental impacts in disaster situations. A simple, consensus-based qualitative assessment process, involving narratives and rating tables, is used to identify and rank environmental issues and follow-up actions during a disaster. The REA is built around conducting simple analysis of information in the following areas:

- The general context of the disaster;
- Disaster-related factors that may have an immediate impact on the environment;
- Possible immediate environmental impacts of disaster agents;
- Unmet basic needs of disaster survivors that could lead to adverse impacts on the environment; and
- Potential negative environmental consequences of relief operations.

The REA is designed to ensure effective disaster assessment and disaster response management. The REA does not replace an environmental impact assessment (EIA), but responds to immediate information needs and fills a gap until an EIA becomes feasible. The REA can be used immediately and up to 120 days after a disaster, or during critical stages in an extended crisis.

- **Flash Environmental Assessment Tool (FEAT)**
  The Flash Environmental Assessment Tool (FEAT), developed by the UNEP/OCHA Joint Environmental Unit, helps to identify existing or potential acute environmental impacts that pose risks for humans, human life-support functions, and ecosystems, following sudden-onset disasters. FEAT focuses primarily on immediate and acute impacts arising from released hazardous chemicals. FEAT also provides information on physical impacts to the natural environment, such as soil erosion and salt water intrusion.

  Based on this information, users can decide on initial risk management actions under immediate post-disaster conditions. In particular, it helps users make timely and accurate requests for additional, specialized equipment or expertise to address impacts.

- **Emergency Waste Management Guidelines**
  The Guidelines, developed by OCHA and the UNEP/OCHA Joint Environment Unit, provide advice to emergency response actors on good waste management practices - including initial clearance, storage, and disposal.

- **Post-Disaster Needs Assessments and Recovery Framework (PDNA/RF)**
  The PDNA provides a framework for an integrated assessment of disaster impacts involving two perspectives: (i) the valuation of physical damages and economic losses, including with respect to the environmental sector; and (ii) the identification of human recovery needs. It takes into account the overlapping phases in disaster response, the integration of gender issues, national capacity enhancement, international response coordination, and linkage to national development goals. The aim is to prioritize the needs and financial requirements for recovery and reconstruction. The PDNA assesses environmental damages and identifies environmental priorities within the recovery framework.

- **Damage and Loss Assessment**
  The Damage and Loss Assessment (DaLA) methodology was initially developed by the UN Economic Commission for Latin America and the Caribbean (UN-ECLAC) in 1972. It has since been improved through close cooperation between WHO, PAHO, World Bank, Inter-American Development Bank, UNESCO, and ILO to capture the closest approximation of damage and losses as a result of disaster events. It is a flexible tool that can be adapted to specific disaster types and government requirements.

  The DaLA methodology bases its assessments on the overall economy of the affected country. It uses the national accounts and statistics of the country as baseline data to assess damage and losses. It also factors in the impact of disasters on individual livelihoods and incomes to fully define the needs for recovery and reconstruction.

  DaLA also assesses environmental damages and losses. As a precursor to costing the environmental damages, the key environmental issues are identified. The approach accounts for the direct environmental consequences of a disaster, but the methodology itself is flexible enough to cost secondary or tertiary impacts.

Planning Tools for Post-Disaster Recovery

- **Strategic Environmental Assessments**
  Strategic Environmental Assessment (SEA) is a methodology and process for incorporating environmental considerations into policies, plans, and programs. SEA developed as a way to assess and mitigate environmental impacts of strategic plans most commonly related to determining land use and zoning. The purpose of an SEA is to ensure that environmental consequences of plans and programs are identified and assessed during their preparation and before their adoption, and that mitigation measures are proposed to minimize or prevent probable environmental impacts. The public can give their opinion and is informed of the process and decisions that are adopted. In some countries such as the United Kingdom, the SEA involves establishing sustainability (environmental, social, and economic) targets and indicators at the outset of strategic planning to guide the development and selection of alternative development options through needs assessment and consultation. Sustainability objectives are backed up by baseline data against which development alternatives can be assessed.

  SEA is an excellent tool to review and assess post-disaster development plans against environmental parameters, and it allows for alternative development scenarios to be compiled. It also allows a range of issues (and hence the relevant government agencies and other stakeholders) to be brought together under one process, allowing decision-making to become more efficient and inclusive. Reconstruction plans and projects can thereafter be implemented based on the SEA results, and environmental impact assessments (EIAs, see below) for individual projects of the overall plan can focus on identifying appropriate environment management measures related to project implementation.

- **Environmental Impact Assessment (EIA)**
  EIA procedures ensure that environmental consequences of projects are identified and assessed before authorization is given. The public can give their opinions and all results are taken into account in the authorization procedure of the project. The public is then informed of the decision afterwards.

- **Common Country Assessment (CCA)/United Nations Development Assistance Framework (UNDAF)**
  The CCA or UNDAF provides a common development framework for the United Nations system to analyze the national development situation and to identify and prioritize key development issues. Both a process and a product, the CCA/UNDAF is generally aligned with national development priorities and supports implementation of the country's international commitments, including the Millennium Development Goals (MDGs), the Millennium Declaration, etc.
- **Post-Disaster Environmental Assessment**
  Developed by UNEP, the Post-Disaster Environmental Assessment seeks to provide a comprehensive, scientific assessment of the environmental impacts of disasters and to prioritize environmental recovery needs. Results are based on fieldwork and scientific analysis and are used to provide targeted recommendations for policymakers and decision makers. It is generally conducted during the recovery phase after rescue and immediate relief have taken place, and is undertaken upon request from the national Government.

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SHAPING INSTITUTIONS FOR

RECONSTRUCTION: OPTIONS AND TRADE-OFFS

by Joseph Goldberg and Rakhi Bhavnani Sharma

INTRODUCTION

At the center of a reconstruction program is its institutional structure. While people make reconstruction happen, they work through different types of organizations with sets of agreed rules, laws, regulations, and institutional arrangements, both formal and informal, regulating how the reconstruction process will unfold. Having a clear institutional framework with clearly defined roles and responsibilities is essential for efficient and transparent delivery of a reconstruction program. This helps establish commitment to the reconstruction process, which leads to its early commencement and the government's credibility in mobilizing resources.

The context for determining institutional arrangements for disaster recovery is often highly complex with decision-making based on limited information about complicated issues with long-term impacts. Needs are often uncertain, large influxes of actors need to be coordinated, resources allocated and tracked, and progress needs to be made on the ground much quicker than in regular development programs. Much of the success in recovery and reconstruction can be attributed to its institutional design. The purpose of this paper is to explore some of the options and trade-offs in determining institutional arrangements for recovery and reconstruction and develop recommendations for more effective policies and planning for future disasters.

PHASES OF RECOVERY: IMPLEMENTATION AND ORGANIZATIONS

Post-disaster recovery is typically divided into a series of three phases – immediate relief and response, early recovery, and long-term reconstruction – each of which require different skills, tasks, and institutional arrangements. The immediate relief and response phase is centered on improving the immediate welfare of affected individuals and saving lives. While there are many different management models that have been used in the relief and response phase, having a dedicated organization exclusively to undertake the relief process has been an effective model in many disasters.

The recovery phase involves the restoration of services to the public and returning the affected areas to pre-emergency conditions. This phase overlaps with both the relief and reconstruction phases and includes activities such as debris removal and cleanup, repair of lifeline utilities, coordination of damage assessments, the provision of interim housing, the restoration of social and health services, and other activities. The institutional requirements for the provision of these services can be significantly different from those in the relief phase and are not usually as clear-cut as the relief period. The organization undertaking relief, for example, is tasked with activities such as placing large numbers of trained people (e.g., medics and rescue workers), equipment, and materials (tents, blankets, medicines) in the field quickly and immediately erecting temporary shelters for masses of people. It is unclear whether the same organization is capable of undertaking recovery activities such as removing rubble, apartment houses, or building dikes before the next flood season. Therefore, if such a relief organization does not already exist, or an alternative agency, for example the army, cannot be used to simulate one, such capacity needs to be created after the disaster as a priority activity.

While relief and its organization must predominate in the early weeks and probably months after a disaster, recovery and reconstruction planning must also start immediately, including its institutional planning.

A progression of phases of disaster response demands a number of agencies or units which are more or less specialized in the work of those phases. For effective

management, there is a need for a sequence of leadership roles through the life of the response program. We believe that this sequence should be governed by an apex coordination institution discussed below in the section on "coordination."

SPEED – THE ESSENCE OF DECISION MAKING IN POST-DISASTER RECOVERY

Many of the characteristics of disaster programs, including institutional arrangements, derive from the need for speed, which in turn leads to the need for flexibility. Most disasters destroy housing, which requires resettlement of homeless people as quickly as possible. This can be compounded in cold climates where the urgency is even more acute. In order to minimize welfare losses, there is a need to also reinstate medical and educational services, as well as production to minimize economic losses.

A natural disaster can provide a unique but brief window of opportunity for new approaches and innovations to be developed.

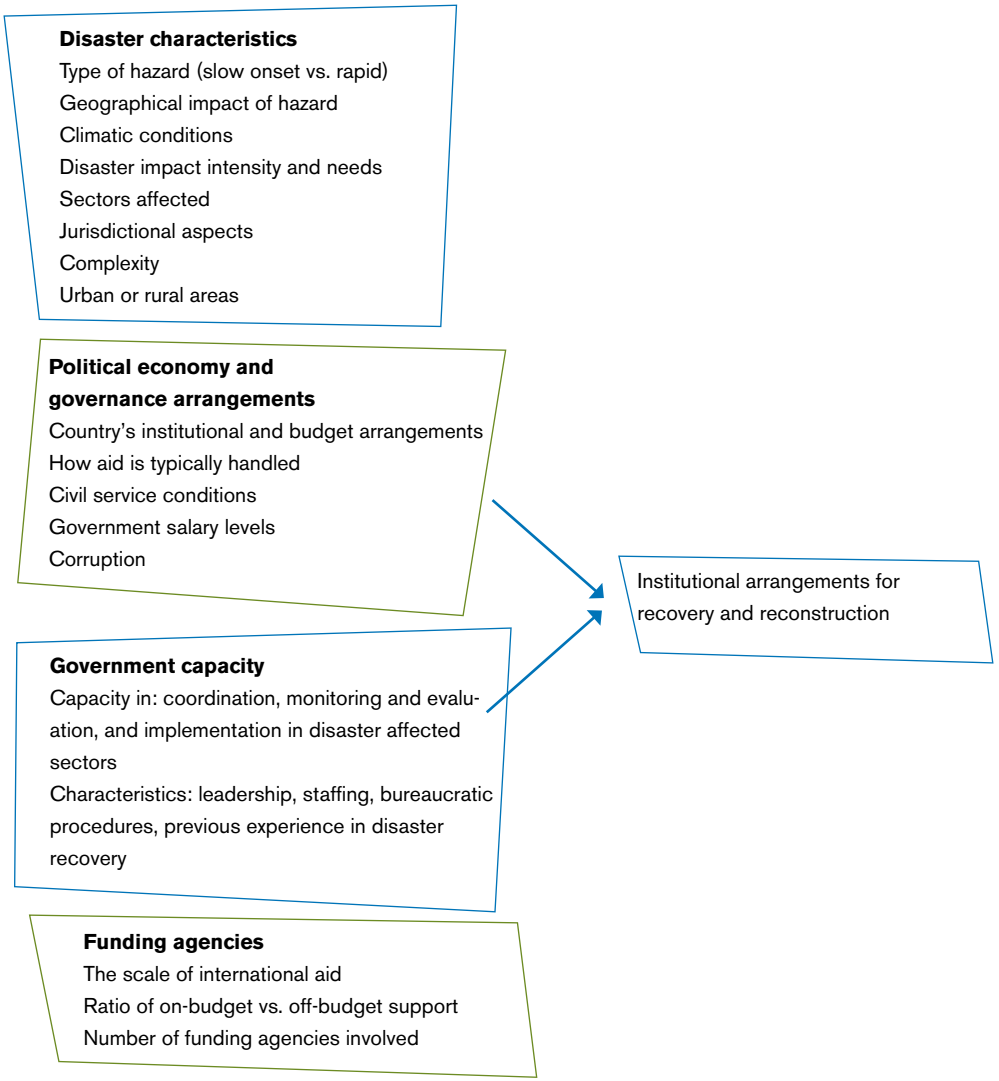
A natural disaster can provide a unique but brief window of opportunity for new approaches and innovations to be developed. These could include introduction of national insurance programs, new designs for housing, and the creation of parks in flood plains. These processes, important as they are, should not be allowed to delay the mainline of relief, recovery, and reconstruction operations. This of course must start with shaping the institutional arrangements for response to the current crisis. Donor fatigue can set in quickly and the sooner there is a suitable vehicle and institutional mechanism for support, the more effectively funds can be raised and managed.

FACTORS IMPACTING THE DESIGN OF INSTITUTIONAL ARRANGEMENTS

In the very early stages of disaster projects, decisions must be made on the nature of institutional arrangements. Because of the exceptional needs of disaster recovery, often a unit needs to be assigned with specially designated staff for management of issues and funds in addition to planning and implementing the relief, recovery, and reconstruction. There is no systematically

derived process for coming to decisions on institutional designs; however, there are a number of common factors impacting the design of project arrangements: i) characteristics of the disaster; ii) the political economy and governance environment of the country; iii) existing capacity of the government; and iv) funding agencies. Figure 1 below shows the general factors determining the character of the institutional setup in a schematic form.

Figure 1.



Disaster Characteristics: Institutional arrangements for reconstruction depend on the type of hazard, its geographic impact (i.e., widespread or concentrated, urban or rural), scope of devastation and needs, climatic conditions, urban or rural areas, and sectors affected. The size of the country, jurisdictional aspects (one state/province or multi-state/-province), and magnitude of disaster are important factors in determining the setup of special agencies. The 2004 Asian Tsunami created devastation on an unprecedented scale in Indonesia (Aceh) and Sri Lanka, and even functioning local governments faced difficulties in undertaking the reconstruction effort.

Political Economy: Impacting decisions on institutional design are country contextual factors such as a country's existing institutional and budgetary arrangements, in particular how aid is received, civil service structure, and governance arrangements. These factors impact the setup of institutions based on existing gaps and limitations, yet also impact the project efficiency and potential for long-term capacity building.

Government Capacity: This includes the government's capacity to undertake recovery and reconstruction tasks such as policy and standard setting, coordination, monitoring and evaluation, donor interaction, and implementation in disaster-affected sectors. These factors depend on leadership, staffing, bureaucratic procedures, and previous experience in disaster recovery and reconstruction where institutional arrangements have been arranged and can rapidly be reorganized. In disaster-prone countries or provinces, "semi-permanent PMUs (project management units)" are quite common and can mobilize quickly. Some of the best performances in the record of projects for relief, resettlement, and reconstruction have been completed in cases where there were pre-existing and well-experienced PMUs. Thus, while later in this paper we advocate for sunset clauses on PMUs established for single emergencies (e.g., if they are not to be transformed into permanent government units), pragmatism would argue that such moves be weighed carefully. Gaining critical mass, cohesion, effective internal working relationships, the right staff in the right jobs, are all organizational goods which are not easy to achieve and which may take a year or more for even the most competent leadership. It would be unfortunate to disband all this organizational capital only to have to rebuild it again from scratch a short time after.

Box 1. Innovative Intra-Government Mechanisms to Fill Capacity Gaps: Twinning Cities After the 2008 Sichuan Earthquake

Following the 2008 Sichuan earthquake, the Government of China implemented a strategy to provide additional resources to affected populations throughout the relief and recovery phases. The strategy, called 'twinning,' linked several badly impacted counties and cities with other Chinese provinces and municipalities. These partnerships aimed to assist affected areas with resources, personnel, and moral support for recovery. A reported 1-3 percent of the annual gross domestic product of sponsor provinces was pledged towards long-term recovery efforts in the affected county for at least three years. For example, Wenchuan County, the epicenter of the earthquake, was paired with wealthy Guangdong Province for long-term reconstruction assistance, including the provision of medical personnel to replace staff lost in the earthquake, and the training of Wenchuan-based staff in teaching hospitals in Guangdong.

Source: Hoyer, Brian, "Lessons from the Sichuan Earthquake," Humanitarian Exchange Magazine 43 (June 2009), http://www.odihpn.org/report.asp?id=3008.

Funding Agency Characteristics: Often, disasters bring in new actors including other states, donors, and international NGOs. The scale of international aid, number of funding agencies, and the amount of on-budget as opposed to off-budget support impacts the institutional arrangements of recovery and the level of coordination required.

MODELS FOR THE MANAGEMENT OF RECOVERY

There are several possible options with regard to the institutional arrangements for managing reconstruction with the optimal choice depending on the factors outlined above such as the scale of the disaster and reconstruction needs, country size, geographical impact of the disaster, and pre-existing capacity of central and local agencies to handle the special spending/implementation demand of reconstruction. Two models have been commonly

adopted after disasters: i) one that is integrated into an existing ministerial system, usually in the form of a coordination body; or, ii) one that is a separate agency with the specific role and responsibility of recovery efforts. A middle third organization is that of an interim recovery task force which may eventually evolve into a full recovery organization.

1) Working through Existing Government Arrangements: Governments may choose to organize recovery and reconstruction through normal line ministries and related service departments or agencies of government without any significant organizational changes. After the floods of 2000-2001, Mozambique applied this model with the nodal agency undertaking both the coordination function and implementation. In Latin America, where in many countries there are strong line agencies, there are coordinating bodies which are often the only "disaster agencies," with implementation work being undertaken by line agencies of the government. In several Latin American countries, this coordination is effected through the mechanism of budgets where the agency receiving the budget for disaster response is responsible for coordinating the work of all recipients. For example, in Costa Rica, the Civil Defense agency serves as the coordinating agency. It implements the damage assessments with the line agencies, develops the reconstruction plan, issues the Declaration of Emergency, and then allocates the budget available to the various line agencies according to its judgments of needs. Mexico's FONDEN (see Box 2) operates in much the same manner. This model is appropriate where there has been significant reconstruction experience and capacity in place as well as well-practiced administrative and operational procedures.

Box 2. Mexico's Fondo Nacional para Desastres Naturales (FONDEN) uses budget funds, extra-budget revenues from petroleum sales, and even catastrophe insurance claims to organize and support reconstruction activities typically undertaken by line agencies and local governments.

2) Creating a Recovery Task Force: In certain cases, a recovery task force is created, typically comprised of designated representatives from existing ministries or government agencies led by a senior government official. This model can often be the initial tentative arrangement that later evolves into a new organization. After the 2010 Pakistan Floods, a National Disaster Management Commission (NDMC) was set up in addition to a National Disaster Management Oversight Council (NDMOC) while longer-term recovery arrangements were being developed. Following the 2004 Asian Tsunami, a task force was initially setup in Sri Lanka as well, which eventually grew into a separate recovery organization.

3) Creating a New Recovery Organization: The creation of a new institution to manage reconstruction is desirable in a situation where it is unlikely that the existing government institutions will be able to implement a high volume of additional projects at increased speed while, at the same time, sustaining routine public services. This option consolidates reconstruction in one agency that provides oversight, a single point of coordination for international stakeholders, and additional capacity to implement and expedite reconstruction projects. Special agencies have been a core feature in many reconstruction processes, particularly after large-scale natural disasters. These units can be centralized or decentralized but are often placed at the apex of political power and authority, with strong representation from line ministries. This option provides a unified approach to the recovery effort; however, it draws capacity from other ministries which some may argue limits the opportunity for long-term capacity development. A recent example is the creation of the Rehabilitation and Reconstruction Agency (BRR) NAD-Nias following the 2004 Asian Tsunami in Indonesia.

In most South Asian countries, there has been a pattern of creating specialized agencies capable of undertaking both the coordination and implementation of recovery. Examples are the Gujarat State Disaster Management Agency (GSDMA) following the Gujarat Earthquake of 2002 or the Earthquake Reconstruction & Rehabilitation Authority (ERRA) in Pakistan after the earthquake of 2005. The requirements for undertaking coordination and implementation were so large after the Pakistan earthquake that ERRA grew to over 2,000 staff before downsizing in 2010. For the disaster-affected areas situated in remote northern Pakistan, in the foothills of the Himalayas, this single-agency approach may have been the only route to success.

Several observers note that more important than the form of agency are the functions that need to be fulfilled. The end goal of recovery and reconstruction planning is “empowered decision making” - the ability of competent, carefully selected people of high professional integrity, committed to the interests of the shattered communities and affected populations, to take strong decisions and try what seem to be sensible and feasible courses in as rapid a sequence as possible.

FUNCTIONS

Developing effective institutional arrangements for disaster recovery and reconstruction is not limited to agencies but also includes the processes and procedures for undertaking recovery tasks. Regardless of the type of institutional arrangement, there are some common functions that need to be undertaken which include planning, standard setting, oversight, coordination, implementation, and monitoring and evaluation.

Several observers note that more important than the form of agency are the functions that need to be fulfilled. The end goal of recovery and reconstruction planning is "empowered decision making.

Special Procedures: Special policies, laws, or special dispensations for reconstruction are usually required for speedy recovery and rapid implementation. Two of the successful cases, that of Costa Rica's Civil Defense (CD) and that of Pakistan's ERRA, are marked by a special procedural regime which appears key to the successes achieved. Under declared emergencies, Costa Rica's CD faces much speedier processes than under normal government programs, and so do the line agencies operating with CD-allocated budgets. This is so marked and critical that line agencies transfer their own budgets during emergency periods to CD so that they can expedite their work under accelerated rules. In Pakistan, ERRA was able to create special dispensations, accelerating procurement, recruitment of staff, and transfer of civil servants, all of which were elements of its superior performance. The important point, according to one observer, was that "to break normal routines, one has to institutionalize urgency." This is a critical factor for all the stages of emergency response, whether the lead role is with permanent government agencies or temporary project units.

Coordination: As described above, the progression of disaster response demands a number of agencies or units more or less specialized in the work of those phases. However, determining when the phases shift and which agency should lead is critical for seamless transitions in recovery. A centrally coordinated mechanism is essential for effective cooperation among agencies as well as engagement with international donors. In cases where many international NGOs are implementing programs, a central agency can ensure their efforts are consistent, coordinated, and targeted to meet needs and gaps in the program. Centralized planning ensures that the government is able to set

common standards for all involved, including donor agencies. Thus, there is a critical need for an apex body to plan recovery and reconstruction as well as set overall policies, strategies, and standards, especially in areas such as cash transfers, asset compensation, and housing entitlement.

In Colombia, effective coordination of the recovery and reconstruction stages was achieved by an entity with a more explicit financial orientation, the Coffee Belt Reconstruction Fund (FOREC). Following the 1999 earthquake in the coffee region, the Inter-American Development Bank and the World Bank helped to establish FOREC to coordinate the reconstruction of the coffee region. It had a decentralized management structure, with NGOs and universities undertaking the municipal reconstruction efforts, as well as line government agencies. This institutional arrangement may only have been achievable in Colombia's unique circumstances but it does underline the importance of working with strong institutional assets in any particular national system. Again, the Latin American model of using budgetary funds to coordinate activities of many organizations should be noted.

While the importance of coordination, particularly donor coordination, is well known, in practice, mechanisms such as consultative group meetings and other formal mechanisms of coordination and harmonization perform less effectively, with conflicting objectives and processes. But this goal is important in disaster recovery and reconstruction with the cost of disarray among donors being greater and more obvious. One approach is for early meetings of the donor community with government after a major event and the designation of one of the main donors as a lead, responsible for coordinating the work and inputs of all external sources of assistance. To do this and reap the benefits of tighter organization and programming without diminishing the enthusiasm and actual contribution of several other potentially large sources may be a challenge. Another possibility is a system of steering committees. Here, the challenge will be to obtain quick and clear decisions.

Monitoring and Evaluation: With the need for exceptional speed in implementation come inherent risks. More expenditure than normal development programs per unit of time can mean that more people will need to be

engaged, recruited, and transferred to work on the program than in normal development programs of the same magnitude. Given the speed of expenditure and many of the fast-track mechanisms and large numbers of staff, there can also be opportunities for corrupt practices and sheer unintended mistakes in the absence of strong monitoring and evaluation mechanisms. Thus, whatever the perceived need for speed, checks on both integrity of the planning and payment flows, and on professional review of investments, must be built into the process, often on a simultaneous basis to avoid waste and loss of credibility.

Therefore, effective monitoring systems are essential in the reconstruction process to ensure urgent needs have been addressed by sufficient funding and that resources are used effectively and are reaching intended communities. The design of these systems depends on the size of the disaster and number of players engaged in reconstruction spending, the quality of country reporting systems, and existing capacity within agencies tasked with monitoring and evaluation roles. The monitoring systems should have both internal and third-party monitoring arrangements, the latter sometimes at multiple levels.

In parallel to monitoring systems, there is a need to have a very robust grievance redressal system which should be linked to the monitoring system to keep track of objective application of rules and criteria.

Implementation: Implementation is often separated from the coordination and monitoring functions for a number of reasons. Coordination often needs to occur at a centralized level. For large disasters, this occurs at the national level. Implementation needs to occur as close as possible to the local level and therefore is decentralized. Line agencies or local governments need to be involved in the reconstruction process. In addition, establishing separate new systems for implementation may create incentives for these agencies to be perpetuated and hinder their eventual phasing out. Finally, assigning the new agency with implementation could undermine its monitoring role and leadership.

RISKS AND TRADE-OFFS: SHORT-TERM VERSUS LONG-TERM CONCERNS

The need for speedy responses and flexibility, lack of accurate information, and capacity constraints together create a number of trade-offs which may relate to balancing short-term and long-term values. This is not limited to institutional planning, however; rather, it applies to the broader recovery and reconstruction areas as a whole. What follows are some of the key trade-offs as they relate to recovery and reconstruction programs.

Planning Resettlement and Livelihoods: A particularly problematic trade-off exists between speed of resettlement and quality of livelihood development – an issue which needs to be addressed when designing institutional arrangements for recovery and reconstruction. Often, disaster recovery programs suffer from poor or even non-existent planning of new livelihoods for resettled victims. In the case where old livelihoods are permanently destroyed by disasters, perhaps by the deposition of layers of silt and rock too thick to remove economically (e.g., as in the Kosi River floodplain of northern India and southern Nepal), new livelihoods will have to be developed in a new location. It must be recognized that at least final resettlement will not be able to move faster than feasible livelihood redevelopment, and this should be announced and planned early on. A recent negative example, where political leadership was intent on producing virtually instantaneous new settlements, with no regard whatsoever to possibilities of any new livelihoods (agricultural or otherwise), or indeed of basic water supply and sanitation, was the settlement of Georgian refugees from Southern Ossetia after the 2008 war between Georgia and Russia. Indeed, one can find other examples of such settlements in the Caucasus typically housing refugees from previous armed conflicts. These may serve various political purposes, but they are not good examples of development-oriented reconstruction.

There may be some modalities whereby both speed of startup work and generation of temporary livelihoods can be accelerated together, generally involving employment of survivors in at least the early phases of reconstruction work. For recovery functions such as rubbish removal and demolition

of unsafe structures, or excavation of mud from canals and other structures, it may be possible to shorten a long effort to procure contractors through normal tendering procedures, and instead turn to force account using either national agencies or units from unaffected provinces, for example provincial public works departments with mandates that needed labor be recruited from among disaster survivors. This, if well managed, could both accelerate needed work and put cash in the hands of those most in need, especially with mandates that labor be paid at the end of every day. A second and larger program along similar lines would involve owner-driven reconstruction with design, advice, and materials supplied by government agencies, or perhaps completely at the discretion of the beneficiaries, with only funds supplied by government or donors. Fengler, Ihsan, and Kaiser (2008) note that, "In weak and/or cumbersome governance arrangements, off-budget channels (partially through NGOs) seem to be critical in the early phase of reconstruction. In Aceh and East Timor, mobilization of the private sector and NGOs at the initial stages combined with community development-driven reconstruction achieved rapid results on the ground and also increased community participation (e.g., cash-for-work programs)."[1] More detailed considerations of these modalities can be found in the WRC Thematic Session Background Paper on Reviving of Livelihoods and Local Economy.

Start Mitigation Early: Another trade-off in speedy recovery planning is with long-term disaster risk reduction. Mitigation programs need to be planned, proposed, and initiated as soon as possible, mainly because they are politically the least attractive. They often provide few obvious short-term benefits to the masses of citizens, and often high costs and little visibility. Examples include the development of storm and flood forecasting systems, river training works, or catastrophe insurance systems. It is often only in the near-aftermath of major disasters that such mitigation systems can garner the political support needed to develop momentum. Postponement of startup work on such long-term solutions may only mean that the next disaster will again catch the region or country unprepared.

[1] Fengler, Wolfgang, Ahya Ihsan, and Kai Kaiser, "Managing Post-Disaster Reconstruction Finance: International Experience in Public Financial Management," World Bank Policy Research Paper 4475 (2008).

PERMANENCE OF DISASTER RECOVERY INSTITUTIONS

A long-standing issue has been the need for permanent disaster management institutions. Since this paper is concerned with disaster recovery and reconstruction specifically, this section will elaborate the need for long-term agencies that service this need.

As discussed in previous sections, a number of different institutional arrangements are possible for effective long-term recovery and reconstruction, but in all cases, the capacity to undertake recovery and reconstruction is built up over the course of a disaster program. What should happen to this capacity when disaster recovery programs come to an end? How to determine when a permanent institution to serve recovery and reconstruction needs is warranted?

In large part, the frequency of disaster events should determine the appropriate institutional response, militating for certain types of permanent agencies with specific ongoing mandates. In some regions, floods of settled, built-up areas occur virtually every year, with severe floods every 2-5 years. Predictability of disasters adds to the power of this factor, even when frequency is low. For example, major El Niño events seem to occur every 17 years, i.e., with very low frequency, as do certain insect infestations and migrations. The strength of the predictability means that preparatory measures can be rationally spaced out over preceding years, and readiness - as much as is possible - can be achieved in time without extreme and perhaps infeasible expenditures in the short term.

Another factor in establishing a permanent institutional arrangement to deal with recovery and reconstruction is the scale of rare catastrophic events. For example, a large landscape earthquake has been predicted by seismologists to strike the vicinity of the city of Istanbul in the coming years. Even without any strong indication that this will be in the short term, nor any real temporal predictability, the magnitude of the potential loss of life and property in this extremely densely populated, highly developed region, is such that a permanent program of retrofitting of important buildings, major infrastructure, and development of some sort of protection of residences, is fully justified.

Thus, a permanent local government agency to manage such retrofitting and construction is also justified. It would seem that these principles may be relevant in most parts of the world.

Box 3. Growth of Institutions in Bangladesh for Disaster Recovery and Reconstruction

In terms of frequency of major disasters, there may be no country or region more afflicted than Bangladesh. Geologically, it is mostly a low flood plain of two large rivers, the Ganges (Padma) and Brahmaputra (Jamuna), and their joint delta. The normal snow melt floods of these rivers often coincide with high monsoon rainfall floods within the country, and when these also coincide with cyclones from the Bay of Bengal, or even mere spring tides, a large portion of the country, sometimes over half, is deeply inundated. Between 1970 and 1998, 171 large-scale water-related disasters – an average of six per year - killed an estimated half million people, with an average of around 14 million people affected per year.

Bangladesh, however, has advanced in developing robust institutional arrangements for disaster management to respond to frequent disasters. The nodal disaster management agency, the Ministry of Food and Disaster Management (MFDM), consists of two departments, the Disaster Management and Relief Division, and the Food Division. The Disaster Management and Relief Division undertakes the work of the relief phase as well as a number of activities of recovery or early reconstruction. The recurrent food shortages due to perennial flooding have led to the creation of a specialized and permanent food security agency in the same ministry, further institutionalizing the government's disaster response capacity.

Another agency undertaking disaster management and water infrastructure is the Bangladesh Water Development Board (BWDB), the executive agency of the Ministry of Water Resources (MWR). A very large portion of their ongoing water resource construction work is flood control and drainage investment, an important mitigation need in the country. The

Box 3. Growth of Institutions in Bangladesh for Disaster Recovery and Reconstruction (continued)

reduction in losses over time, from floods of similar magnitude, despite increasing population and development densities, is an indication that MWR and BWDB have performed creditably in prioritizing such investments, to use whatever limited funds are available to them to tackle the more important locations first, in effective ways. Other specialized units of MWR are responsible for flood forecasting and flood monitoring functions, with their outputs available to all in real time.

In sum, the overall evolution of disaster management in Bangladesh has well institutionalized its ongoing responses to perennial flooding with the Ministry of Food and Disaster Management continuing to develop its capacity for comprehensive risk reduction.

Furthermore, some of the most well-known cases of organizational success in disaster recovery and reconstruction have involved units created to manage specific emergencies and later transformed into permanent agencies of government responsible for ongoing functions. One of the most well-known cases is the PMU for recovery after the Gujarat Earthquake in India which not only graduated into a permanent disaster management agency of the Gujarat State Government but also thereby became a model for the other Indian States.

However, as disaster management encompasses disaster relief as well as recovery and reconstruction, a question may arise of how effective a single nodal agency can be to serve very different functions. In Turkey, a temporal emergency agency was transformed into permanent agencies, but with this, was something lost? Fengler and his colleagues mention that an emergency unit "usually has a limited period of life. It is unlike a regular disaster management institution which is usually part of government function and responsible for disaster preparedness, promoting disaster prevention/risk reduction, and integrating disaster risk management into national development strategy."[2]

[2] Ibid., p. 8.

Both the tasks of disaster relief and its institutional culture are much different than those of recovery, reconstruction, and preparedness/mitigation. One may wonder whether the patient, analytical, and somewhat formal culture of an organization devoted to the latter aims could ever be accelerated and informalized to that required for an organization which must respond to conditions changing not by the day but by the hour – where there is little time for written memoranda and formal decision meetings. One organizational approach which might solve this dilemma may be the Bangladesh one where in the same ministry, different departments for relief and for food security planning and implementation may coexist; institutional cultures, after all, are built, and may differ, at levels of organization far below the ministerial level, often in fairly small units.

The main arguments in favor of a dual role for the disaster management organization – serving both emergency and non-emergency functions – are probably that at least the permanent organization: a) exists, has a core hierarchy and structure, and staff which can be multiplied when disaster occurs; and, b) is continuously undertaking preparedness for emergency situations.

RECOMMENDATIONS

Assigning Responsibilities, and Preparing for Reconstruction to Save Time and Resources when the Disaster Occurs: There is a need for pre-establishing policies, systems, and resources for recovery and reconstruction as much as planning for the emergency relief period. This includes formulating a vision and framework for post-disaster recovery planning, and developing or strengthening of institutions and regulations to facilitate disaster recovery operations. The "window of opportunity" for innovations that follows disasters is often the only real political chance available for creation of such innovative, and often widely opposed, institutional structures. In Turkey, it was only the Marmara Earthquake of 1999 that catalyzed the development of the Turkish Catastrophic Insurance Pool and the Turkey Emergency Management Agency under the Marmara Earthquake Emergency Rehabilitation project, after being discussed fruitlessly for at least a year prior to the earthquake. On the other hand, agreement was reached

between the World Bank and the Romanian Government to accept the Hazard Mitigation Project which included several long- and medium-term mitigation programs against floods, dam bursts, and earthquakes, with no current disaster as a backdrop. Perhaps the lesson is that efforts should be made to establish such institutions and long-term programs even in non-disaster times, but if they do not succeed in winning national approval, such detailed proposals for establishing and equipping such institutions or programs should be kept in a high state of readiness for the unfortunate opportunity of a disaster which proves their usefulness. In the Romania case, this is being done by developing outlines for catastrophe insurance. In addition, expanding emergency planning for disaster relief to also include recovery and reconstruction is an important step.

Disaster Recovery Is a Full-Time Job: In some reconstruction episodes, a practice has been to form teams (at least on paper) of the best people to manage reconstruction tasks while retaining their normal (and highly responsible) government positions. This is not good enough. There is a role for part-time advisors or inspectors, but the real implementation of disaster recovery is more than a full-time job. Spare time contributions can be heavily discounted; all focus should be on the full-time, dedicated forces.

Form Project Implementation Units (PIUs): In the recent past there have been questions on the role of PIUs. Some argue that "autonomous" or "semi-autonomous" PIUs may be undermining local capacity building, distorting salaries, and weakening relationships in the government policy-making arena. Others have argued that PIUs are not meant to be sustainable but are meant to ensure that very important projects and programs get done well, fast, and transparently. Disaster response programs require more speed than typical development programs. Even in agencies specialized in disaster relief, reconstruction, and mitigation, a small leadership unit needs to be formed quickly with enough expertise in each necessary branch of work to ensure that norms of resettlement, feeding, engineering, procurement, sanitation, livelihood development, accounting and auditing, monitoring and evaluation, environmental protection, and others are met, either through coordinating the work of others, or by doing it themselves. In many cases, PIUs can be embedded in the existing structure and become implementation agents for line ministries,

ensuring that they remain in charge of their sector. In other cases, PIUs have been set up to focus primarily on fiduciary functions while existing line agencies remain in charge of program design and supervision.

The Best Organizational Approach Will Be Tailor-Made: Every country and disaster context is different and each organizational approach for recovery and reconstruction must be based on the unique governance traditions of each country, the capacities of the organizations and staff after the disaster, local governance structures, community self-reliance, and the strength of contractors and NGOs, among many factors. Institutional approaches need to be drawn from scratch after each disaster. The nature of the disasters themselves, for example Pakistan's earthquake of 2005, which was fairly concentrated in remote mountain regions, versus the 2010 floods which were Indus Basin-wide, affecting tens of millions in largely low-land areas, dictate differing organization responses even in the same country.

The best organizational approach will be tailor-made.

Creating Extra Contingencies in Contingency Planning: With the best of planning, new or old problems will continue to arise during implementation. Many times, the original solutions to problems were inadequate and need to be revised, or problems which could have been foreseen, such as cholera in Haiti, were not adequately protected against. If a recurring problem proves serious, it may be that only a special organizational unit devoted to its solution will be sufficient to the task of solving it, in essence a mini-PIU. In such a case, a responsible unit needs to be formed, staffed, and focused on that problem until its cause is reduced in magnitude to routine status. At that point, the unit should be disbanded or merged into a larger ongoing unit, with some of the assets redistributed to currently more pressing problems.

Institutional Arrangements for Livelihoods: As mentioned previously in this paper, reestablishing livelihoods after disasters is perhaps the most difficult part of recovery. Here, a distinction may be made between creation of temporary livelihoods, such as paid work in the relief or reconstruction program itself, which may be best managed by those particular agencies, and reestablishment of permanent livelihoods. For the latter, the greatest difficulty, and the one requiring real sustained organizational effort and coordination, occurs where

previous livelihoods are actually destroyed. Finding new assets on which to base new jobs, or stimulating the creation of new jobs via enterprise creation or investment in expansion, could require joint efforts of rural credit and micro-credit institutions, local agriculture and livestock departments, bureaus of light industry, transport, economic development, and many others, including NGOs which often may be both larger and more competent in such fields than government agencies. The very first assessment of damages should pay close attention to issues of livelihood redevelopment among the affected population, estimating the proportion which will require formation of new livelihoods, and those who should stay near existing natural assets, and reestablish their old lives. This should guide resettlement planning, and be fully coordinated with it.

If a large enough mass exists that requires new employment, the development of a separate Working Group for Livelihood Redevelopment for the duration of the reconstruction program should be explored by the lead recovery agency. Livelihood redevelopment is different enough in character from other recovery and reconstruction activities that it might be expected to lead a largely independent existence under its own coordinator or PMU Director. In a sense, the mandate of this group is the economic development of the disaster area, with all the complexity that this brings. For example, investors need to be lured in, technical training programs need to be established, special incentive programs may need to be created for hiring of labor in the affected area, new farms may need to be established, and cadastral rights need to be quickly established. These tasks seem particularly worthy of a separate node of a reconstruction organization, as in practice, effective livelihoods redevelopment is often difficult and should be addressed through institutional arrangements for recovery.

Multi-Donor Trust Funds: A mechanism increasingly used over recent years for coordination amongst numerous donors who often join to support recovery and reconstruction efforts is the Multi-Donor Trust Fund (MDTF). MDTFs can be managed by either government appointees or international donors. The World Bank itself has assumed this role on several occasions. The organization of a MDTF should play a critical coordinating role in disaster recovery and reconstruction.

Increasing Role of NGOs: NGOs and INGOs are increasingly playing an important role in disaster recovery and reconstruction where traditionally their work has been limited to the disaster relief phase. Both the size of these organizations and their established presence in affected communities have catalyzed their role in both the implementation of disaster reconstruction and policy decision making. Following the Gujarat Earthquake of 2001, the Government of India partnered with the Self-Employed Women's Association (SEWA) to implement a seven-year community-driven livelihood security project for rural households. After the 2004 Asian Tsunami, the South Indian Federation of Fisherman Societies (SIFFS) and SNEHA (Social Need Education and Human Awareness) initiated the NGO Coordination and Resource Centre (NCRC) to improve coordination of local NGOs involved in recovery and reconstruction. Senior officials of the Tamil Nadu state government partnered with NCRC to facilitate coordination and information exchange between the government, affected communities, and other recovery actors. The NCRC was a separate non-implementing organization, which placed it in an ideal position to undertake social audits and advocate the needs of beneficiaries. The broadening of potential capacity can provide a whole new set of skills, knowledge, and resources to improve and accelerate recovery. Where there is no immediate recovery experience to build on, building such partnerships before disasters is essential.

Box 4. University's Role in Yogyakarta Recovery

The Gadjah Mada University played a central role in the recovery of Yogkayarta and the affected regions of Java following the 2006 Java Earthquake. Bringing to bear their knowledge and resources in the fields of health, the built environment, social science, and economics, they served as a key partner to the local governments, the National Reconstruction and Rehabilitation Agency, as well as donors and INGOs.

One such area where GMU provided assistance was the community-driven reconstruction initiative. GMU noted that the community needed technical support and training on the practical aspects of building earthquake-resistant housing, while the government needed to establish a system to facilitate and control the process to assure the quality and products of the reconstruction effort. The Faculty of Engineering at the university established a technical support unit called POSYANIS (Pos Pelayanan Teknis,

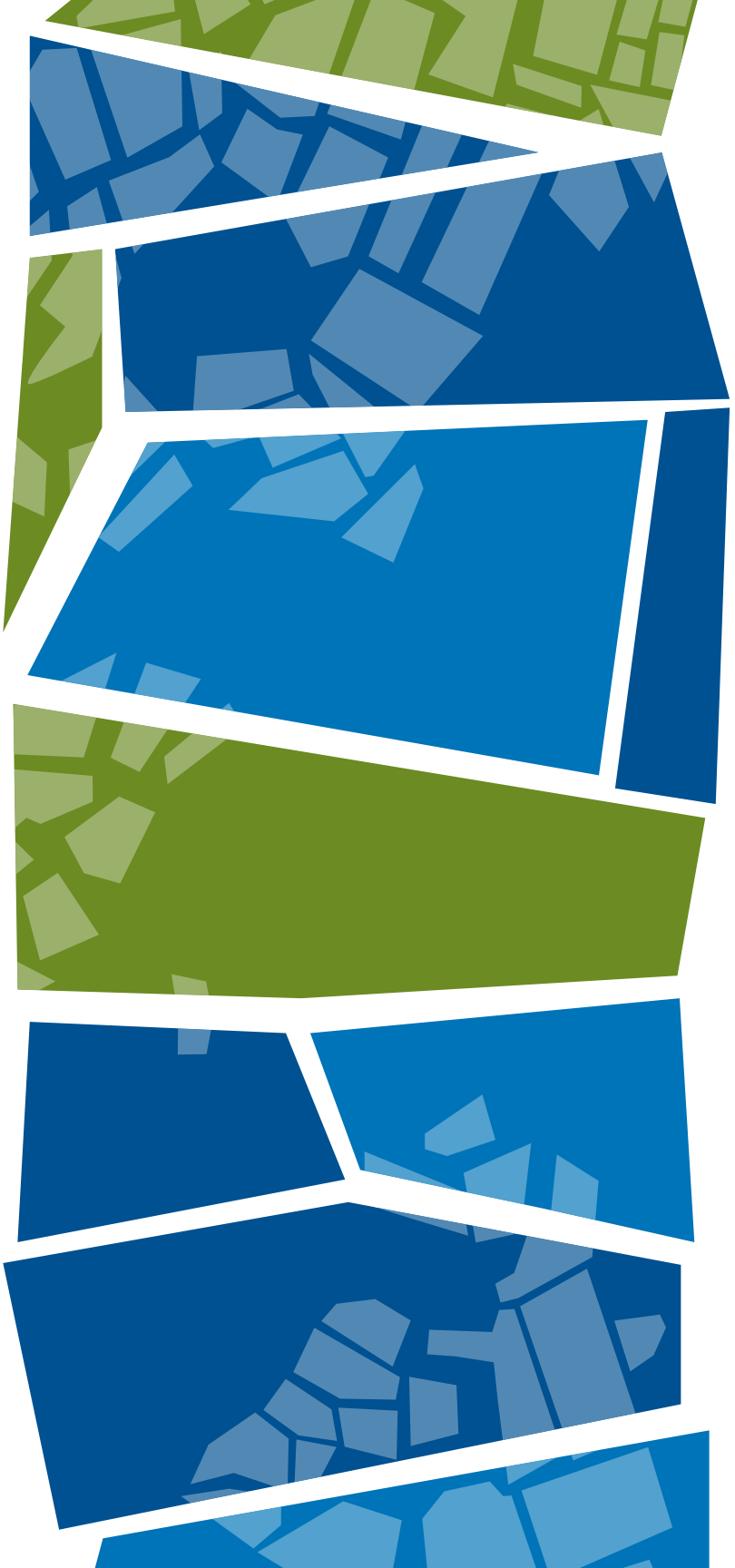
Box 4. University's Role in Yogyakarta Recovery (continued)

Technical Support Unit) to assist and support government policies related to the community-based reconstruction effort. POSYANIS was established in the first week after the earthquake to mobilize students and staff in assisting with building safety assessment.

Upon realizing that many of the victims had already started to try rebuilding their destroyed houses on their own, without any technical knowledge or know-how related to earthquake-resistant building design, POSYANIS established a unit that could provide technical information and guidelines that would be easy to understand and implement by the community.

In order to ensure that self-constructed houses met the earthquake safety requirements, POSYANIS developed simple technical guidelines for lay readers and provided earthquake-resistant construction training through mobile housing clinics. The mobile housing clinic would move from one sub-district to another providing training, technical assistance, and advocacy services, as well as disseminating government information on recovery policies and procedures. In addition, POYSANIS worked with the District Office of Public Works to develop an accelerated building permit issuance process to ensure quality control of earthquake-resistant methods without delaying the reconstruction process.

Source: International Recovery Platform, "Yogyakarta and Central Java Earthquake 2006," Recovery Status Report 01 (2006), http://www.recoveryplatform.org/assets/publication/RecoveryStatusReport/RecoveryStatusReport_Yogyakarta.pdf.



PROTECTING AND EMPOWERING

VULNERABLE GROUPS IN RECOVERY

by Margaret Arnold and Cynthia Burton

1. INTRODUCTION

Disasters are not neutral. They compound social exclusion and existing vulnerabilities, disproportionately impacting the poor, women, children, the elderly, disabled, minority groups, and those marginalized in other ways. Reconstruction and recovery interventions are also not neutral. They can increase, reinforce, or reduce existing inequalities. The World Bank (2006) notes that: "The unevenness of [disaster] impacts is often highly visible because of media attention, but the recovery process is potentially more uneven, and it tends to be less visible, at least to those on the outside, because their attention has turned elsewhere."

If reconstruction and recovery programs are to achieve the often-stated goal of making communities more resilient to future hazard events and climate change, three things are required: a clear understanding of the pre-existing social, political, and economic factors that contributed to the vulnerability of the poor and marginalized before the disaster; recognition and understanding of how relief, recovery, and reconstruction interventions can reduce, reinforce or increase those vulnerabilities; and investment in actions to ensure these groups are effectively reached and empowered.

This paper aims to provide the reader with a clear understanding of why certain groups are not only more vulnerable to the impacts of natural hazard events, but why they may also be more vulnerable to ending up in a worse situation as a result of the recovery process. It examines different stages of recovery to illustrate these issues and demonstrate how recovery support can be designed to upgrade the living standards of the poor, to enable the most marginalized to participate, and to establish mechanisms between affected citizens and government to foster accountability.

Certain groups are not only more vulnerable to the impacts of natural hazard events, but why they may also be more vulnerable to ending up in a worse situation as a result of the recovery process.

2. UNPACKING DISASTER VULNERABILITY

Vulnerability to the impacts of disaster and climate change is socially differentiated. The suffering and losses that people experience from natural hazard events are not only a consequence of their exposure to a physical hazard, but are shaped by social, political, and economic factors. Certain groups are particularly vulnerable to disasters, for example, female-headed households, children, the disabled, indigenous groups, landless tenants, migrant workers, and other socially marginalized groups. The root causes of their vulnerability lie in a combination of their geographical context; their financial, socio-economic, cultural, and gender status; and their access to services, decision making, and justice. For instance, more than 90 percent of the estimated 140,000 fatalities in the 1991 cyclone in Bangladesh were women (Mearns and Norton 2010); in India, up to three times as many women as men died in the 2004 tsunami, while in Indonesia, this figure rose to up to four times the number of male casualties (Guha-Sapir et al. 2006). The limited mobility and social status of women increased their vulnerability to these events.

Those who are already poor and socially vulnerable are at higher risk, as they are more likely to lack adequate resources to buffer them against hazard impacts. Such groups are also nearly always the most difficult to see and to hear, tend to be the most disenfranchised, and are the least accustomed to expressing and asserting themselves (Twigg 2004, 125-26). They often face difficulties gaining access to decision-making processes and resources to improve their situation and protect themselves from risk (World Bank 2010, 19).

In a post-disaster context, the poor and marginalized face further obstacles to accessing entitlements, such as government relief or recovery assistance. They are less likely to understand how to work through the bureaucratic system or may not have access or entitlement to key documentation, such as national identity cards. Even in some wealthier countries, it has been found that navigating the aid process requires education, time, and skill that poor families – or minority/migrant groups - usually do not possess

Box 1. Vulnerable and Invisible

The International Organization for Migration (IOM) found that the December 2004 Indian Ocean tsunami aggravated the already precarious legal and socio-economic position of many thousands of migrants from Myanmar who worked in agriculture, fisheries, and construction along Thailand's shoreline. Because of their status, many did not come forward for assistance for fear of arrest and forced return to Myanmar. Others faced difficulties re-establishing their legal identity or recovering lost permits and authorizations. Some were unable to reclaim the bodies of dead relatives, and the majority failed to claim the compensation offered by the Thai government for deceased relatives.

Source: IOM (2006).

(Seidenberg 2006, 6-7). Many relief and recovery responses to major disasters remain limited in their attention to the need for different approaches to ensure that vulnerable groups are appropriately reached, despite considerable evidence of the harmful impacts of not doing so.

3. TRANSITION FROM RELIEF TO RECOVERY: PROTECTING THE VULNERABLE AND PROMOTING RESILIENCE

Actions taken during the first days, weeks, and months after a disaster have a major impact on the recovery process to follow. The choices made regarding the kinds of relief and transitional assistance to be provided, and how it is provided, can facilitate or hinder the recovery of affected communities (Christoplos 2006). For instance, after the 2001 earthquakes in El Salvador, single women insisted that the sheeting provided for temporary shelters be opaque and strong. In the past, it had been translucent, making it easy to see when they were alone. Given that it could easily be cut with a machete, many women had been raped (ALNAP 2003).

While disaster-affected communities require critical relief support to preserve life, alleviate suffering, and maintain human dignity, they also begin an immediate process of self-recovery to rebuild their livelihoods, homes, and institutions that have been destroyed or weakened by the event. Poor households may resort to selling off their scarce productive assets, such as livestock, to meet basic needs, and thus become even more vulnerable to future shocks.

In addition, the sense of urgency that pervades relief efforts (particularly in sudden-onset disasters) many times carries over into recovery, leading to shortcuts in consultative processes that sideline local decision-making structures. People and institutions that might help rebuild communities may be left out. Too little may be done to ensure that the social and livelihoods needs of the affected population are considered. The poor and vulnerable may become even more disadvantaged than they were before the disaster (World Bank 2009).

For these reasons, efforts to restore livelihood opportunities, essential infrastructure and services, and governance capacity need to take place in tandem with emergency assistance. This work should augment ongoing humanitarian operations, support spontaneous recovery initiatives by affected communities, and establish the foundations for longer-term recovery.[1] The assistance should create the conditions to support households, communities, and governments to undertake their own self-directed recovery and to withstand future shocks.

Ensuring Safety and Protecting Human Rights

Protection risks to women, children, older persons, persons with disabilities, and other at-risk groups increase as access to basic needs decreases (UNHCR 2010). The need to provide a safe environment for vulnerable groups during relief operations has been increasingly recognized in recent years by the international community. The UN Inter-Agency Standing Committee's (IASC's) Protection Cluster has identified a number of vulnerability and protection risks that can arise as a result of natural disasters. These include unequal access to assistance, forced relocation, sexual and gender-based violence, loss of documentation, recruitment of children into fighting forces, unsafe or involuntary return or resettlement, and issues of property restitution (IASC 2006).

Of immediate concern after a disaster is ensuring the physical security of physically vulnerable people, such as women, children, and older or disabled people. Violence and sexual harassment of women and children typically increase after a crisis when civil and administrative structures are weakened. Such risks are often overlooked by officials as social/cultural reluctance obstructs addressing these issues. In recent years, the UN IASC Protection Cluster has made efforts to raise the profile of these issues and to identify follow-up actions together with the governments of affected countries.

Cases also continue to surface in various crisis settings of aid workers abusing vulnerable affected people, despite international commitments to prevent this. A June 2010 IASC Review of Protection from Sexual Exploitation and Abuse [PSEA] by UN, NGO, IOM and IFRC Personnel found that

[1] Adapted from the UN Inter-Agency Standing Committee (IASC), Cluster Working Group on Early Recovery website (2008).

> "...while progress has been made on the establishment of PSEA policy, this has not translated into managerial and staff understanding and acceptance of these policies... [I]mplementation is either patchy, poor or non-existent... [T]he most critical gap (…) is that of visible senior management leadership to actively promote PSEA policies and to proactively support PSEA activity, while holding field managers accountable for implementation... PSEA focal points are not being effectively supported; effective personnel awareness-raising and complaints mechanisms are not in place; and monitoring of activity and sharing of good practice is not happening" (Reddick 2010, 6-7).

Natural disasters often force many people to leave their homes, with a high number of people becoming temporarily or permanently internally displaced. Internally displaced people (IDPs) can be a particularly vulnerable group. Discrimination and disregard for economic, social, and cultural rights may emerge during emergency response. The longer the displacement lasts, the greater the risk of human rights violations. While responsibility for protection of IDPs rests with national governments and local authorities, they are often unwilling or unable to meet these needs. Thus, groups providing assistance must include effective safeguarding of the IDP rights under international humanitarian and human rights law (UN IASC in World Bank 2009).

Important among these is the right of IDPs to make informed and voluntary decisions as to whether they want to return, to settle where they found refuge, or to go. There may be situations in which authorities determine that conditions are too unsafe to permit return to an area (e.g. when the disaster has made the area uninhabitable). However, there have also been situations where forced relocation has occurred (e.g. when a disaster offered an opportunity to move poorer people away from land with potentially higher value for re-development). If these influencing factors are not well understood, there is a risk of aid providers inadvertently supporting forced relocation or relocation to unsuitable areas. As these planning decisions are often made during the early weeks and months following a disaster, agencies need to investigate the potential issues at the earliest opportunity.

In situations where the affected population must move into temporary shelter settlements, the design of the settlements and related services also needs to take security risks into account. For example, appropriate lighting is required for areas frequently used by women and girls. Guaranteeing adequate privacy is also critical. Women and girls should be consulted on the setup and location of sanitation facilities to ensure that the route is safe, that latrines are well lit, lockable from the inside, and offer privacy. The needs of older and disabled persons with mobility constraints also should be taken into account, such as distance to the toilet and ease of access/use. Separate facilities should be put in place for males and females, not directly next to each other. Pregnant women in temporary settlements are at high risk due to the psychological and physical strains put on their maternal health. Medical facilities should be established specifically for pregnant women, lactating mothers, and infants, as should adequate reproductive health services for both women and men. Additional policing and the establishment of safe and confidential reporting mechanisms in the event of incidences of abuse or violence are examples of the kind of considerations that need to go into planning such settlements.

Orphans and children separated from their families are at high risk of abuse, abduction, and kidnapping. Physical security and legal protection for them is a priority, as is family reunification. In Pakistan, following the 2005 earthquake, the government put a ban on any adoption of children from the affected areas. For orphans, interim and alternative care options that are culturally sensitive should be provided, and unnecessary institutionalization should be avoided. Street children can be particularly invisible to relief and recovery planners. Awareness raising and training on child rights and child protection should be carried out for all concerned actors.

In summary, care needs to be taken to ensure that all vulnerable groups are physically protected and their human rights respected. Otherwise, survivors of disaster not only face the trauma of losing loved ones, livelihoods, and assets, but also may have their vulnerabilities exploited or face the additional trauma of physical or sexual violence.

Protection and Replacement of Income and Assets

For the poor and vulnerable, recovery from the impact of disasters depends significantly on how well livelihoods are protected and restored. The loss of income and productive assets through a disaster may cause households that already were in a state of transient poverty to sink into chronic poverty and also cause households that were on the verge of poverty to become impoverished. This is particularly the case when large groups of people have been affected by a disaster--or subjected to multiple, repetitive shocks--and cannot resort to traditional reciprocity-based coping mechanisms because the coping capacity of family and neighbors has also been eroded (Alam et al. 2006).

For women and others in the informal sector, the loss of housing often means the loss of workplace, tools, supplies, and markets.

During the initial period of disaster response, agencies can play a key role in helping people protect their income and assets through existing community outreach mechanisms. This may include activities such as:

- Replacing lost livestock and other agricultural inputs and tools;
- Replacing household assets;
- Providing fodder and veterinary services to ensure livestock survival;
- Organizing seed fairs, seed vouchers, or cash for seed; and
- Replacing stock, equipment, or tools lost by small businesses (including home-based businesses).

During the 2010 Pakistan flood response, some aid agencies organized fodder drops to stranded farming households in order to protect their valuable farm animals from perishing. In Ethiopia, the ongoing Productive Safety Net workfare program reaches over 7 million people; a survey after the 2008 drought found that beneficiaries living in households that got at least 10 days of work a month in the previous three months consumed 30 percent more calories and held more livestock than non-beneficiaries. Public works combined with seeds, credit, and irrigation raised wheat and maize yields by about 200 kilograms per hectare (World Bank/UN 2010, 137-38).

For women and others in the informal sector, the loss of housing often means the loss of workplace, tools, supplies, and markets. Haiti's economy is approximately 85 percent in the informal sector, and within that more than 75 percent of those

participating are women. Agricultural produce is often produced in the garden by women and traded in the marketplace for other essentials not produced by the household or manufactured, and provides the income with which women feed and care for their children. It is important in post-disaster settings like Haiti to formally recognize women's agricultural activities and provide compensation for their loss of tools and agricultural inputs.

Box 2. Support for Children and Host Families in Haiti

The British and Danish Red Cross societies, in collaboration with the Haitian Red Cross, are providing livelihoods and school fees cash support for host families and the children living with them in areas outside of the earthquake-affected capital of Port-au-Prince. The societies recognized a vulnerable group that had been missed through the SMS (text) messaging tracking system for affected Haitians, as the parents had left their children with these families while seeking income-earning opportunities in the capital, taking their mobile phones with them. Both the host families and the children are living in strained economic and social circumstances; the funds and other support to be provided are intended to contribute to easing these strains and the risks that accompany them.

Where poor households have lost their means of making a living or become food-insecure, food aid or labor-intensive public works schemes (e.g. food-for-work) to restore community assets can provide them with much-needed income. Rubble clearance, marketplace rehabilitation, or drought mitigation works are examples of commonly used means of injecting income into the local economy in the aftermath of a disaster.

A 2006 evaluation of the World Bank's experiences in disaster response further highlighted that "cash support stabilizes the situation of the poor during early recovery" (World Bank 2006, 49). This includes cash grants, cash for work, providing cash to microfinance institutions for low-interest loans or other forms of financial support, and vouchers for goods such as seed and livestock. Overall, research has found that in appropriate circumstances, cash-based programs can be less costly, timelier, and better adjusted to people's needs and preferences than the distribution of commodities. This also includes initiatives like the rental funds support provided to households displaced by Turkey's 1999 Marmara earthquake and house reconstruction support (both cash and materials) provided to small farmers following the 1991 North China earthquake. Beneficiaries have used unconditional cash transfers for a variety of purposes, such as purchase of food; paying off debts and loans; payment of school and health-care costs; purchase of livestock, agricultural inputs, and tools for petty trade; and setting up small shops (World Bank 2009).

Remittances from family members who are working in other areas or countries are another key component of disaster-affected peoples' coping strategies. This was the case in Sri Lanka, for instance, following the 2004 tsunami. Net private remittances grew by more than 28

percent between 2004 and 2005 and topped US$1.7 billion, while some skilled expatriates returned home to provide medical support to affected communities (IOM 2006). Activities to increase poor communities' access to modern technological cash transfer mechanisms and/or to restore remittance flows after a disaster may be a quick and effective way of supporting livelihoods recovery, especially as recipients tend to share remittances with their extended families and even their neighbors (Savage and Harvey 2007). Likewise, not all who need help receive remittances, and there are sometimes impediments to such flows that the government could remove, e.g. controls on capital flows or dual exchange rates (World Bank/UN 2010).

Likewise, funding can be channeled through microfinance institutions and savings societies to provide low-interest credit to meet such needs. The World Bank's Mongolia Sustainable Livelihoods Program (MSLP) has a funding window that is used to finance demand-driven investments in basic infrastructure at the level of community groups and investments in pastoral risk management to improve herding communities' preparedness for and post-disaster recovery from drought and winter storms.

Traditional safety nets may fail to reach some vulnerable groups where they target beneficiaries by income or other indicators such as ownership of land or assets.

The Role of Social Safety Nets

Social safety net mechanisms have become an important disaster response vehicle to provide compensation or reconstruction payments to more poor and vulnerable households. In some cases, this has been highly successful, such as the transfer of accommodation and repair allowances through Turkey's Social Solidarity Fund following the 1999 Marmara earthquake, and the damage payment system developed by the Maldives government after the 2004 Asian tsunami and earthquakes (World Bank 2006, World Bank/UN 2010).

In other cases, certain vulnerable people have been missed in the deployment of safety nets (Pierce 2010). The victims of a disaster may not be those that an existing safety net is designed to catch, for example, those who become permanently disabled or find themselves impoverished as a result of the disaster. Traditional safety nets may fail to reach some vulnerable groups (e.g. children, women, elderly) where they target beneficiaries by income or other indicators such as ownership of land or assets. Urban slums and informal settlements that

are outside the legal sphere are often overlooked. Likewise, recent studies have indicated that 11 percent of those that sustained injuries during Cyclone Sidr in 2007 were left with permanent disability, yet disabled people are virtually excluded from the country's disaster preparedness and response activities. More practical indicators, such as nutritional or disability status, may be needed, though data collection for short-term use may be expensive (World Bank/UN 2010).

Box 3. Malawi: Implementing a Productive Safety Net in Response to Drought

In response to drought in 2004/2005, the Malawi government implemented a Public Works Program (PWP) through the Malawi Social Action Fund (MASAF). In September-December 2005, cash income was provided to vulnerable households through Conditional Cash Transfers (CCTs) to enable them to buy food and agricultural inputs for the next growing season. The program contributed to Malawi producing a bumper crop of 1.5 million tons of maize in 2006.

The PWP-CCT was designed along the lines of MASAF 3 Local Authority Managed Projects, a conventional Public Works Program that MASAF had been implementing for 10 years. Beneficiaries were paid a wage that was 20 percent lower than the market wage; the local leadership selected the beneficiaries. Only one person per household was eligible to work under the program. The program's innovation was to tie the cash payment to a condition that beneficiaries buy seeds and fertilizer as inputs for the following year's harvest. After 10 days of work, beneficiaries earned enough to buy one 50-kilogram bag of maize and one 50-kilogram bag of subsidized fertilizer. The PWP-CCT ran alongside a government program of farm input subsidies. If there had been no parallel government initiative, the cash transfer would have been inadequate to meet the cost of these inputs.

Nearly 600,000 people benefited directly from the program. MASAF successfully disbursed US$12.1 million to all 28 district assemblies of Malawi, and 1,838 public works sub-projects were carried out across the country.

Source: World Bank (2009).

Safety net programs in a number of countries are being designed with post-disaster recovery and proactive risk reduction in mind. This is in line with the World Bank/UN study on Natural Hazards, Unnatural Disasters, which concluded that "to achieve a quick and organized response, safety nets need to be in place before hazards strike. Trying to put in place safety nets after a hazard strikes is often impractical and ad hoc" (2010, 159). In Vietnam, World Vision and its local partners support the preparation of community-based disaster risk management plans, along with the promotion of diversified income sources to minimize the livelihood impact of losing crops or fishing equipment in extreme weather events. This has been achieved through the provision of loans and revolving funds to communities and managed by the Vietnam Women's Union. And in Kenya, Oxfam undertook a cash-for-food pilot program, targeting up to 10,000 people with timely and predictable cash transfers each month for between six and nine months. The work focused on infrastructure projects, which were identified by the community and were both labor-intensive and technically sound. These projects also contributed to reducing vulnerability – for example, by maintaining water sources. Those who could not work, such as elderly people, were provided direct assistance. The cash was provided alongside emergency food relief, which ensured that the cash was used to support livelihoods development rather than all being spent on food (Newsham et al, 2011).

4. RECONSTRUCTION AND LONGER-TERM RECOVERY: EMPOWERING THE POOR AND VULNERABLE TO BUILD MORE RESILIENT COMMUNITIES

While the poor are the hardest hit by disasters, there is little analysis of how the poor and marginalized are treated during recovery and how the impacts of reconstruction and recovery works are distributed among socio-economic groups (World Bank 2006, 47). Disasters not only increase the short-term economic and social vulnerability of the poor, but also erode their ability to cope with future shocks. In the case of slow-onset or regularly recurring hazard events or shocks, many poor communities live in a constant state of recovery where temporary relief has become a permanent coping strategy. In Malawi, drought occurs with such frequency that people have little time to recover before another drought hits. This has resulted in deepening poverty, chronic food insecurity, and aid dependency.

Participatory approaches to recovery can empower communities to both meet current needs and reduce future risks. However, many recovery strategies are based on an 'assistance' approach, treating communities as beneficiaries or clients rather than the drivers of their recovery and development.

Identifying and Targeting Marginalized Groups

Target populations must be identified on the basis of actual need; community participation is essential to achieve this (ProVention Consortium, 2005). Engaging civil society organizations already working with vulnerable or marginalized groups and using well-tested participatory community facilitation methodologies are important steps to gaining access to less visible groups. Agencies and governments may need training on how to work with marginalized groups and how to use participatory techniques. Coordinated, multi-disciplinary, multi-agency assessments are the best mechanism to ensure that these needs and priorities are adequately identified and the linkages between sectors understood (World Bank 2006). They also can avoid or reduce the problem of duplication and identify gaps in aid coverage. The updated edition of the *SPHERE Humanitarian Charter and Minimum Standards for Response*, to be released in 2011, has moved away from a 'vulnerable group' approach to targeting (i.e. simply assuming women, disabled people, etc. are all vulnerable) to acknowledging that vulnerabilities are more complex, context-specific, and may change over time.

After a disaster and during recovery, lack of data can impede equitable distribution of assistance. For example, entitlement programs have traditionally favored men over women, tenants of record, bank-account holders, and perceived heads of households. Conversely, the specific needs of men have sometimes been left out, such as stress, alcohol counseling, or developing the skills to cope with becoming a single parent; this can be a significant need given that women comprise the majority of those who die in disasters. Youth, the elderly, the disabled, landless tenants, and families hosting those displaced may also be less visible and inadvertently overlooked in assessment processes. Damage and loss assessments can help ensure equity by disaggregating mortality and morbidity by gender and age, and taking into account losses suffered in the informal sector.

Box 4. Vulnerability Targeting Issues in Pakistan

During the 2007 response to flooding in Pakistan's Balochistan and Sindh provinces, the national and local authorities worked together with other organizations to bring relief supplies and shelter to the affected population. The relief operations were aimed at addressing beneficiary needs as a whole, and not at segmented groups or communities with varying abilities to access relief goods (both physical and social). Widowed women and orphaned children became the focus of some well-intentioned institutions, but they neglected to view these individuals within the context of the deprivation of entire communities to which they belonged. Thus, there were some strategic interventions where those being actively denied access, or those who were unable to access relief (such as the landless, or those belonging to a different caste) were excluded from being counted as vulnerable. This became problematic at the policy level, as the number of widows and orphaned children was not deemed to be of a serious proportion in comparison to the overall number of affected people. The opportunity was thus lost to address vulnerability issues in a robust manner during disaster relief and recovery implementation.

Source: Young Sir N et al. (2007, 7).

The costs of not adequately resourcing targeting-related functions is seldom considered, yet numerous evaluations have demonstrated adverse impacts in terms of community conflict, construction delays, reputational risks, etc. A lack of understanding and analysis on behalf of decision makers of the implications of certain approaches can contribute to poor judgments or assumptions about the impact of interventions on vulnerable or marginalized groups. Some programs that target specific groups (single parent-headed households, orphans, people with disabilities) have been based more on assumptions than robust needs assessments, or the selection criteria have not been well discussed with the affected communities. Too often, the focus is on fulfilling physical construction targets without taking the time to analyze power relations and engage communities to ensure socially appropriate and equitable outcomes.

In order to target the most vulnerable, equity, vulnerability, and conflict sensitivity need to be systematically institutionalized into the policies, systems, and procedures of organizations at every level. Equity (and equality) and vulnerability sensitivity need to be valued within organizations as worthy of investing both human and financial resources. Senior management needs to lead by example for policies to be implemented; they must also actively monitor their implementation using robust performance indicators. A recent evaluation of UNHCR's implementation of its *Age, Gender and Diversity Mainstreaming Strategy found that the strategy* was innovative and led to positive improvements in staff knowledge, attitudes, and needs assessment processes.[2] However, successful implementation of the strategy was hampered by a need for more pro-active senior management leadership, effective accountability functions, and adequate resources and capacity (UNHCR 2010). The evaluation further noted that "where special funds and extra technical support have been made available to address specific protection gaps at country operation level, there is a corresponding response in terms of targeted actions" (5).

Such measures will not resolve the inevitable pressures that arise in deciding on whom to target for assistance in a disaster recovery operation. There will always be different priorities and agendas competing for a limited resource base. However, a clear institutional framework that is adequately resourced will go a long way to better identification and management of targeting issues. Organizations should further consider keeping a certain small percentage of uncommitted funds in reserve to be able to respond flexibly to changing circumstances. It is inevitable that some needs will change or missed groups will come to light during the implementation of programs – not all needs or forms of vulnerability can be identified at the outset of a response.

Housing and Human Settlements

Facilitation between government, contractors (where used), and communities is essential to design settlements that include key community services (roads, water and sanitation, schools and health centers, lighting, etc.) and facilities

[2] A 2010 CDA study found that the attitudes of aid workers have a significant impact on program perceptions and outcomes: CDA, *The Listening Project Issue Paper: The Role of Staffing Decisions*, June 2010.

that promote social cohesion (community centers, places of worship, parks, playgrounds, etc.). This may also include the integration of livelihoods support into planning and must consider access to sources of livelihoods. The World Bank's 1993 Argentina Flood Rehabilitation Project facilitated interaction between affected communities and the authorities, resulting in the timely availability of construction materials and the accommodation of local customs in the architectural design of the new houses. Staff observed that this created ownership among homeowners and increased maintenance (World Bank 2006).

Box 5. Community and Local Government Participation in Owner-Driven Rebuilding in Gujarat

The Gujarat Emergency Earthquake Reconstruction Program (GEERP) aimed to promote sustainable recovery in areas affected by the 2001 earthquake and to lay the foundation for sustainable disaster management capacity in Gujarat. The main component of the project was an owner-driven permanent housing construction and house repair program. Through another component, village-level sub-centers were established to build capacity for earthquake-resistant construction and to form self-help groups to monitor the program and be responsible for disaster preparedness in the future. This was supplemented by information, education, and communication activities, along with gender sensitization workshops for those working with the affected communities. A community-based disaster preparedness program was also initiated, and local government mechanisms to undertake social audits were strengthened.

Source: World Bank (2010a).

The perceived need to rebuild housing and infrastructure quickly often outweighs the need for equity. These assets tend to consume the greatest share of recovery resources and are highly visible. This can have a negative impact on targeting decisions as aid providers compete for programming space in order to utilize a large amount of donated funds. Both governments and donors usually feel considerable public pressure to show quick results and may make

The perceived need to rebuild housing and infrastructure quickly often outweighs the need for equity.

programming decisions based on limited information about, or consultation with, the affected population – let alone take the time for the greater depth of assessment and specific approaches required to identify the most vulnerable and ensure their inclusion in key decisions. The 2009 review by the Tsunami Global Lessons Learned Project (TGLLP), *The Tsunami Legacy: Innovation, Breakthroughs and Change*, found that:

> "Often, tight deadlines imposed by the need to deliver fast had the effect of dropping equity issues – or of the wrong projects being taken up by the wrong organisations for the wrong reasons ... to truly build back better, donors, organisations and governments need to embrace participation as key to the success. Stringent deadlines and supply-driven policy making, while satisfying reporting requirements and a home public eager for results, do not always make for measured and efficient programming. Taking the cue from the Paris Declaration on Aid Effectiveness, recovery partners need to internalise the need for a pragmatic approach to consultations and participation." (TGLLP 2009, 10)

Where deadlines are given a higher priority than stakeholder participation, often avoidable misunderstandings and targeting errors occur. The consequences can be inaccurate and inequitable beneficiary lists; tensions with program beneficiaries, non-beneficiaries, and other stakeholders; the unintentional exclusion of some vulnerable groups from programs; or the inclusion of ineligible, better-off households. In some Indian Ocean tsunami programs, missed groups were discovered after funds had been fully committed, so assistance could not be extended to them. Similar experiences have been recorded by other organizations in subsequent high-profile disasters and complex emergencies. A UN inter-agency real-time evaluation of the 2009 and 2010 Pakistan IDP crisis found that humanitarian values for many international organizations were over-ridden or compromised by the need to gain access to the affected population. The end result was that strong support was given to only one party to the conflict (Cosgrave et al. 2010, 3-4).

It is important to assess the socio-cultural and legal context of property rights when designing a major housing program and to promote more equitable

land titling and property rights for the poor and marginalized. Many poor and marginalized people face barriers to obtaining land and property rights. Some problems to which this has led include:

- Damage assessments and beneficiary lists that were inaccurate or did not meet government selection criteria, with many inclusion and exclusion errors;
- Legal and/or working definitions of land/house ownership and inheritance rights that excluded widows, orphans, or ethnic groups with matrilineal inheritance rights; and
- Exclusion of very vulnerable groups such as renters, squatters, and tenant farmers.

The following example from a reconstruction program in Sri Lanka illustrates this point:

> "ODHPs [owner-driven housing programs] were initially not particularly gender-sensitive and had a negative impact on some groups of women. Land ownership in Tamil and Muslim communities generally in the east as well as in some Sinhala communities were matrilineal. Traditionally, lands and houses are given as dowry to daughters on marriage under the mukkuwa system. The damage assessment declaration database recognized the male as the head of household although the land sometimes belonged to the female" (Lyons et al. 2010, 93).

The promotion of gender equality can often be addressed in the recovery process by including women in housing design as well as construction and promoting land rights for women. Some World Bank projects have elevated women's status in society by providing land titles in the names of both women and men, as was done in Maharashtra. Unprecedented in the region, even widows received houses in their own names and ex-gracia payments for lost relatives (World Bank 2006). Indeed, it has become standard practice to issue housing grants and housing and land titles in both the wife's and husband's names, and to stipulate that widows receive houses in their own names after so many cases resulted in positive social impacts. Cases include post-tsunami reconstruction in Sri Lanka; post-earthquake recovery in Maharashtra, India;

It has become standard practice to issue housing grants and housing and land titles in both the wife's and husband's names, and to stipulate that widows receive houses in their own names.

and post-flooding reconstruction in Argentina, El Salvador, and Mozambique. Special attention should also be paid to children's inheritance rights to land and property, and administration by legal guardians.

Restoring records of property rights to housing, commercial property, and land should be launched as soon as possible, with special assistance to the poor, squatters, widows, and orphans. Establishing a multi-disciplinary Land Task Force has worked in other cases to protect land and inheritance rights, as well as land dispute resolution.

The approach taken to the provision of housing can have a bearing on vulnerability outcomes as well. The most commonly used approaches include community-driven construction, donor- or contractor-driven construction, and owner-driven housing construction.[3] In post-tsunami Sri Lanka, owner-driven housing was found to be a faster and more cost-effective method of delivery than donor-driven housing, and achieved a higher level of coverage. At the same time, it suffered from a few inequities during implementation. These primarily related to allocating insufficient resources to pay for hired labor and provide technical support to assist very poor households or households headed by women with young children or older persons. Practical Action found that poorer beneficiaries were the most marginalized in these circumstances and that this was mostly evident in the conflict-affected districts of the north and east (Lyons et al. 2010, 95). Without such support, these groups had difficulty completing their houses and/or compromised on basic safety features.

Community involvement in beneficiary selection and verification systems is a key element to reducing social tensions. Practical Action has documented similar findings in its *Building Back Better: Delivering people-centred housing reconstruction at scale:* "Beneficiary identification was a key tool in community engagement... If this process was seen to be equitable and impartial, communities developed a sense of ownership over the program and became engaged in the reconstruction process. If not, it created conflict, delayed or stopped the program and alienated

[3] Community-driven reconstruction refers to an approach that entails varying degrees of organized community involvement in the project cycle, generally complemented by the assistance of an agency that provides construction materials, financial assistance, and/or training. Owner-driven reconstruction describes a reconstruction approach in which the homeowner undertakes rebuilding with or without external financial, material, and technical assistance. Donor- or contractor-driven reconstruction refers to a reconstruction approach where the donor engages external agencies to undertake rebuilding for the homeowner or manages the process itself.

sections of the community" (Lyons et al. 2010, 147). Rigorous and direct monitoring of selection and distribution processes also was necessary to maintain their integrity, as was negotiation and advocacy with government agencies for the inclusion of the most vulnerable and marginalized members of society. Such work needed to be carried out or monitored by field-based staff and a computerized database set up from the outset for monitoring progress to identify any missed groups and to manage the risk of elite capture.

Box 6. Improving Social Equity: Cash for Repair and Reconstruction Project (CRRP)

The Consortium of Swiss Organizations' CRRP in Sri Lanka provided technical support and cash grants for house repair and reconstruction to tsunami-affected people in specific areas through the Sri Lankan government. Families were provided with US$2,500 if their house had been fully damaged and US$1,000 if their house had been partially damaged. A 2008 evaluation of the CRRP concluded that beneficiary targeting of vulnerable people had been much more effective in the second phase of the project than in the first phase. A total of 250 households were identified that had missed out on their self-build funding entitlements under the project. The families that had been excluded in the first phase were predominantly landless, squatters, or those who were unable to register to receive the assistance. Nearly all beneficiaries in this category were very poor, with a number being single mothers, lone elderly households, or those who had encroached on government land. The main difference between the two phases was that the Consortium undertook beneficiary identification and verification directly, rather than through local authorities, during the second phase. This was done mainly in response to capacity issues identified at the local government level. The Consortium successfully negotiated with government partners to use cost savings from the project's first phase to meet the needs of these 'new' beneficiaries.

Source: Y. Aysan (2008, 2-17).

Communities have a key role to play in monitoring the appropriateness and quality of rehabilitation and reconstruction activities. Community-based organizations (CBOs) can check on progress and provide feedback to contractors, government, and donors. Agreements with governments and contractors (where used) should incorporate a role for CBOs in quality assurance systems, and the CBOs should be given guidance on carrying out the role. The World Bank's Ecuador El Niño Emergency Recovery Project engaged an NGO to facilitate interactions between stakeholders and to conduct training programs. Government agencies also can be trained to carry out technical and social audits.

Box 7. Grassroots Women Skilled in Safer Housing in Jamaica

In 1994, the Construction Resource for Development Centre (CRDC), a local NGO, educated 17 hurricane-prone communities on how to build hurricane-resistant roofs through a "Safe-Roof Retrofitting Project." Half of the 1,050 households were headed by women, and CRDC decided to support women among them to acquire skills to address disaster risk, map physical vulnerabilities in their communities, and learn construction techniques to help protect their houses against hurricanes; this was expanded to women in 28 other communities in 2006, and those trained in turn transferred their skills to other communities. The positive results of the training in generating income for these women and improving community safety in subsequent hurricane seasons has led to the project being adapted to four other Caribbean countries.

Source: UNISDR (2007, 27-29).

The findings of a 2011 IFRC beneficiary targeting study reinforce the lessons detailed above. According to the study, large-scale housing programs that achieved better targeting results were those that:

- Had strategies to manage expectations and allowed sufficient time for community consultation and stakeholder participation in beneficiary identification and verification;

- Pro-actively engaged in coordination and advocacy with the relevant local and/or national authorities;
- Hired appropriate local staff to monitor those processes and set up a computerized database;
- Sufficiently analyzed the socio-cultural context and legal dimensions of property and inheritance rights;
- Provided additional financial and technical support to poorer households and those not able to access household labor to support their rebuilding;
- Used funds flexibly to respond to gaps identified through their monitoring systems;
- Took a holistic approach to community recovery that accounted for physical, economic, and social needs;
- Included host communities in their planning and activities (where resettlement was the only housing option); and
- Balanced quality, speed, safety, and user needs/preferences in housing construction.

Empowering Vulnerable Groups to Build Resilient Livelihoods and Local Markets

To build up household income and assets during the recovery period, recovery programs can maximize the use of local skills, labor, and materials when restoring housing and communal assets. This includes identifying support roles, such as providing meals or drinking water to the workers, for those with less strength or mobility (e.g. disabled or elderly individuals). At the same time, households also will weigh up the opportunity cost of participating in recovery programs. For example, poor women may have to choose between providing labor to restore an access road and restoring their home garden.

Reconstruction programs need to try to preserve social networks and find ways to lower the workload of women. Women shoulder much of the burden of care for children, the elderly, and the disabled, as well as such household tasks as provision of water and fuel wood. Disasters increase the intensity of this work, and informal networks among neighbors and family, an important coping mechanism for women in times of crisis, have often dissolved. Paid

childcare, delivered by older women, for example, was planned in a 2003 reconstruction project in Zambia to recreate a form of support network and to provide paid employment for women.

Surprisingly little market analysis is carried out by agencies to determine the pre- and post-disaster trends in demand for goods and services. Market surveys can correct a tendency among some agencies to view the livelihoods of poor households in overly simplistic ways—farmer, fisher, trader—rather than seeing the diverse set of productive activities usually undertaken. An oversupply of fishing boats in Aceh after the 2004 tsunami put added pressure on fish stocks that had been declining prior to the disaster and increased pre-existing vulnerabilities (Christoplos 2006). Such surveys can also be used to further develop strategies for the urban poor and vulnerable, e.g. if they depended on a job in a factory or an office that has collapsed. Market analysis can identify appropriate education and training opportunities to help individuals diversify their income sources or move into new occupations when they have lost a means of living or it is under threat for other reasons.

The development of programs in savings, credit, and insurance can help recovery and future risk management among poor and vulnerable disaster-affected households in a variety of ways. Households can use production or investment credit to build up assets and increase their future capacity to self-insure. They then can use precautionary savings or credit to smooth consumption in the face of either income shocks or anticipated variations in income or expenditures (e.g. dowries, weddings, or funerals). Governments and aid agencies could expand their current focus on microcredit institutions and savings societies to include working through traditional community coping mechanisms such as burial societies (Bhattamishra and Barrett 2008).

The Bosnia and Herzegovina Local Initiatives Project, operating in a post-conflict situation, created almost 200,000 jobs through the provision of microcredit services. Within three to five years, the microcredit organizations contracted under the project were able to quadruple their active clients to about 100,000, to reduce their interest rate by half, and to cut their portfolio at risk to 1 percent. And in India, as a result of specially targeted initiatives

of the Andhra Pradesh District Poverty Initiative Program, more than 1.2 million rural poor have taken up death and disability insurance coverage, up from fewer than 1,000 before the project (World Bank 2009). These kinds of results are also possible in post-disaster programs, as illustrated by the experience of the Malawi Social Action Fund (MASAF). As a part of its cash-for-work emergency public works program, MASAF encouraged people to form Community Savings and Investment Groups (COMSIP) to facilitate the purchase of agricultural inputs. The program instilled a cooperative culture and links to financial institutions. Usually, assets were sold off during droughts, but this pattern changed with COMSIP (World Bank 2009).

Fostering Accountability Between Affected Citizens and Government

Achieving genuine accountability to beneficiaries, while seen as a desirable ideal by many, in practice often sits uncomfortably with those controlling the decisions or resources. Sometimes, this has to do with a lack of good governance and political will to distribute resources more fairly; other times, accountability to donors is prioritized over accountability to the affected population. A fear of raising beneficiary expectations and the workload associated with managing these expectations can inhibit implementing agencies from adopting them, and power imbalances can also make communities reluctant to participate, i.e. there is a fear of losing much needed support as a result of being too critical. Aid donors themselves often have several layers of intermediaries between themselves and disaster-affected populations, reducing the visible impacts and accountability for poor decisions that they may make regarding the assistance they provide.

The development of strong two-way beneficiary communication and accountability mechanisms is a proven means of reducing conflicts within relief and recovery programs over the distribution of aid benefits, combating corruption or abuse of aid, and identifying who may have been missed. The establishment of specific monitoring mechanisms (e.g. Continuous Social Impact Assessments) can help ensure that women, children, and marginalized groups can access recovery resources, participate publicly in planning and decision making, and organize to sustain their involvement throughout the recovery process.

Recovery as an Opportunity to Build a More Inclusive Society

There have been a number of innovative joint initiatives taken across groups of organizations to improve bottom-up accountability. In Tamil Nadu, India, at the request of local and international NGOs, a Social Audit Secretariat and trained auditors carried out a series of independent equity audits in 2005 and 2006. The equity audit was an open learning process to enable organizations to systematically progress toward social inclusion in their programming and institutional development. Following this work, one NGO reported that, among its partners, the percentage of budget that went to directly support interventions for the excluded rose from 10 or 12 per cent to 60 percent (TGLLP 2009, 46).

Promoting Positive Social Change

Post-disaster situations can be opportunities to empower women and other marginalized groups at the grassroots level to build more resilient communities and initiate long-term social change and development. Creating formal spaces for women and other marginalized groups to participate in recovery efforts and formally allocating resources and roles to them not only contributes to more effective and efficient recovery; it also establishes opportunities for women and communities to shape a more sustainable development.

Box 8. Recovery as an Opportunity to Build a More Inclusive Society

In the past, attention to disability was largely concentrated on the emergency response. A more holistic approach considers long-term needs for continued integrated management, care, social support, and reintegration of people with disabilities into their communities. In this way, post-disaster reconstruction can be seen as an opportunity to build a more inclusive society. The World Bank's Pakistan Earthquake Social Welfare/Disability Project provides a good example. The 2005 earthquake left more than 70,000 people severely injured or disabled. In addition, those already disabled lost their support systems and services they were receiving prior to the earthquake. The project, implemented through the Pakistan Poverty Alleviation Fund, financed physical and psychosocial

Box 8. Recovery as an Opportunity to Build a More Inclusive Society
(continued)

rehabilitation services, skills development, and mobility enhancement for disabled people and their families. NGOs with capacity and expertise that were already on the ground in the affected areas led the work. The project included capacity building of service providers, NGOs, and disabled persons' organizations to provide services, raise public awareness on disability issues, and represent persons with disabilities.

Source: World Bank (2009).

Grassroots women are active leaders in rebuilding their communities after disasters. In Maharashtra, India, after the 1993 earthquake, a local NGO negotiated with the government to secure the appointment of women as communication intermediaries, placing them at the center of the reconstruction process. The women's groups underwent training to build technical capacity and monitor reconstruction. Over time, they became community development intermediaries. In Turkey after the 1999 earthquake, a local NGO (KEDV) began by creating public spaces for women and children to rebuild disrupted community networks and promote women's participation in the public sphere. These Women and Children's Centers started out in tents and then moved to temporary housing settlements. They provided women's groups with a place to meet, organize, learn new skills, gather and share information on the reconstruction process, and start individual and collective businesses.

5. CONCLUSIONS AND REMAINING CHALLENGES

While there is increasing recognition that disaster recovery is not a neutral process, a number of critical challenges remain to effectively engaging with poor and marginalized communities so that they are empowered to drive their recovery and development process. A more realistic understanding of the political economies involved in disaster recovery can contribute to better

informed and more pragmatic programming responses that respect human rights and avoid contributing to existing gender and social inequalities.
Most governments, humanitarian actors, and aid agencies have stated commitments on reaching the most vulnerable through their disaster responses, reflected in various policies, codes of conduct, and humanitarian standards. At the same time, it can be difficult to persuade governments and agencies to sufficiently invest in developing capacity to more effectively reach vulnerable and marginalized groups with post-disaster recovery or risk reduction support. This requires senior management commitment, along with dedicated funding and technical support. Moreover, while most governments and agencies expound the virtues of participatory approaches, there is still reluctance among many local or national authorities to relinquish power or budgets to marginalized groups, let alone develop mechanisms to ensure that their voices are heard. There is a need to pay more systematic attention in disaster response and recovery to considerations of political economy, including greater incorporation of skilled specialists in the analysis of and programming responses to these inequalities.

Ensuring effective outreach and the inclusion of groups that are considered illegal or for which there is deep structural discrimination is a particular difficulty, e.g. illegal migrants, ethnic minorities, urban squatters, etc. This requires a much deeper and frank dialogue among agencies and governments with a view to increasing tolerance and understanding as a core element of humanitarian diplomacy (a number of humanitarian NGOs like Oxfam and World Vision already have such dedicated roles) and identifying concrete actions to support such groups. The Tsunami Global Learning Project's report (2009, 47) recommended to humanitarian aid providers to: "Develop organizational anti-discrimination capacity by reviewing organizational culture and offering training to staff on rights-based approaches to relief, recovery and development, including awareness and understanding of international codes, guidelines and principles." This has been done to a certain extent, but awareness-raising alone often has not led to increased resource commitments. Many governments and agencies still do not understand the costs of NOT investing more in better vulnerability targeting/programming in disaster recovery. More cost-benefit analysis could help to build awareness in this area.

The meaningful implementation of the principles of the Good Humanitarian Donorship initiative, the Paris Declaration on Aid Effectiveness, and the Accra Agenda for Action remains elusive. Donors and governments continue to base many of their larger-scale disaster responses on media interest and political considerations more than the needs and priorities of the affected population, as illustrated by the findings of the 2010 study on the economics of disaster prevention (World Bank/UN 2010, 111). There is real pressure to deliver quickly in such responses. Pro-active strategies are needed to manage expectations, and greater recognition among donors and governments that delivering quality results in a timely manner at scale requires more intensive human resourcing, particularly of community facilitation skills. New and more creative ways of tackling these issues need to be explored by all parties to achieve a realistic and appropriate balance between these considerations.

Many important decisions on reconstruction planning and resourcing are still made on the basis of one-off or limited assessments, without enough understanding of underlying structural issues of inequality, chronic poverty, or vulnerability. A system of ongoing participatory assessment is required in order to build an incremental picture of vulnerability and how it changes over time in a post-disaster context. This needs to be complemented by greater flexibility in the use of resources to be able to redirect or reprogram some funding in response to emerging needs. Getting governments, donors, and implementing agencies to work in more flexible and cohesive ways to respond to this environment has been very hard. The IASC cluster system has improved information sharing but full cooperation and cohesiveness in programming remains elusive.

So while there are a number of opportunities in post-disaster recovery situations to empower poor and marginalized communities to drive their recovery and future development, these are often not seized. There remain considerable institutional biases towards a predominant focus on replacing or improving physical infrastructure, over the more 'soft' or complicated longer-term aspects of recovery work, e.g. restoring livelihoods and social cohesiveness. Such activities are literally visible and concrete, and the results easier to see, but can founder without attention to the socio-economic dynamics of recovery. Bringing

together the often very different perspectives and priorities of economists and engineers with that of community development workers and social scientists in service to the vision and desires of poor communities takes considerable effort. But until this happens, not only will recovery interventions fail to take advantage of the tremendous opportunities for positive social change, but they will continue in many cases to do more harm than good to the poor.

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INNOVATIONS IN DISASTER AND

CLIMATE RISK FINANCING FOR DEVELOPING COUNTRIES

by Olivier Mahul, Laura Boudreau, Morton Lane, Roger Beckwith, and Emily White

EXECUTIVE SUMMARY[1]

Innovation in disaster risk financing and insurance (DRFI) is occurring at all levels of the risk market: risk transfer for sovereign entities, private non-life catastrophe insurance markets for homeowners, agricultural insurance for farmers and herders, and disaster microinsurance for low-income populations. In addition, innovation is happening on different fronts in DRFI – product development, delivery channels, and risk assessment, to name a few – that interact to produce new solutions. These innovations help develop risk market infrastructure that is essential for affordable DRFI solutions in developing countries.

This paper aims to advance the dialogue on creative, forward-looking solutions for developing countries by presenting innovations in DRFI by the private markets and the international donor community, from the macro (government) level down to the micro (household) level.

Combining the insurance and capital market instruments has triggered numerous innovations that may hold significant promise for sovereign disaster risk financing for developing countries. This paper examines the potential of a multi-year cafeteria approach, in which a standard set of multi-year

[1] This is a shorter version of a paper whose full version, annexes, bibliography, and glossary, are available at http://www.gfdrr.org/gfdrr/node/336.

insurance-linked securities (ILS) is repetitively issued as a menu of offerings, for transferring developing country risk to the private market. The tranching of risk portfolios – potentially for International Financial Institutions (IFIs) – into collateralized debt obligations is another, longer-term, vision put forward.

Examples from the London insurance market also support this discussion; they exhibit creative thinking to improve the operational efficiency of domestic insurance markets. The Lloyd's of London "Coverholder" model, in which an entity external to the Lloyd's market underwrites local business on Lloyd's behalf, shows how companies can leverage existing local infrastructure for product distribution. The London Market Data Community demonstrates how firms can share the cost of risk analysis for common exposures, reducing the cost of underwriting support for all participants.

A diverse group of disaster microinsurance programs is testing new solutions for providing disaster insurance to low-income populations. Although these programs have had varying success rates, they provide insight into how disaster microinsurance can meet the needs of low-income populations.

Finally, the paper calls for the establishment of an International Platform for Disaster Risk Financing and Insurance, financed by both the public and private sectors. Its mandate would be to offer technical assistance and public goods and services to the developing countries that want to develop disaster risk financing and insurance solutions as part of their overall disaster risk management agenda.

INTRODUCTION TO DISASTER RISK FINANCING AND INSURANCE IN DEVELOPING COUNTRIES

Over the past 40 years, natural disaster losses have been rising around the world. Global cumulative natural disaster damage for 1970 to 2008 is US$2.3 trillion, with the vast majority of damages occurring after 1990.[2] This upward trend is attributed primarily to increasing exposure: during these years, there was significant growth in population and assets located in high-risk zones. Losses

[2] Figures adjusted for inflation. World Bank (2010).

are expected to continue trending upward due to a variety of factors, including growing urbanization, environmental degradation, and climate change.

Although in absolute terms, damages in developed countries far exceed those in developing countries, damages from natural disasters as a proportion of GDP are much greater in developing countries. In low-income countries, this annual loss is approximately 0.6 percent of GDP. In middle-income countries, it is somewhat higher, approaching 1 percent of GDP. In contrast, high-income countries suffer an average annual economic loss less than 0.2 percent of their GDP. This evidence shows that damages are especially high in middle-income countries, whose regulatory systems (e.g., zoning laws and building codes) often cannot keep pace with rapidly expanding asset bases at risk.[3]

Natural disasters tend to disrupt government budgets in developing countries much more than in high-income countries. After a disaster, the government is expected to provide emergency relief to victims, return critical infrastructure to working condition, and begin planning for recovery and rebuilding, usually while providing uninterrupted "business-as-usual" services outside of the impacted area.

In high-income countries, governments are typically financially equipped (with reserves and quick budget reallocation) to cover their legal and social post-disaster responsibilities. Private insurers also tend to cover a large proportion of the losses. In developing countries, however, governments often rely on humanitarian assistance and financial aid to respond to disasters. Furthermore, weak non-life insurance penetration in most developing countries, particularly low-income countries, means that private insurers shoulder little to none of the losses.

The majority of the government's disaster funding needs are not incurred until the later recovery and reconstruction phases. Thus, the government is allowed time to mobilize ex-post funding sources for the cost of reconstruction. Ex-post sources include budget reallocation, tax increases, domestic credit, external credit, and donor assistance.[4] Even if the government expects to utilize ex-post

[3] Cummins and Mahul (2009).
[4] Ghesquiere and Mahul (2010).

funding, however, it still needs immediate access to liquidity for initial relief and early recovery. Although these liquidity needs are not nearly as great as the costs incurred later for reconstruction, they are critical to avoid funding gaps and to mitigate budget disruption caused by the event. Likewise, continually mobilizing ex-post resources for small, recurrent events is cumbersome. Governments of countries prone to these types of disasters (e.g., minor floods) could benefit from ex-ante financing to efficiently cover losses.

When vulnerability to disasters is translated into monetary amounts, the sizeable return on investment from disaster risk reduction is elucidated.

Over the past 15 years, in parallel with the international community's shift in focus from ex-post disaster aid to ex-ante disaster risk reduction, increasing attention has been paid to the development of solutions to meet governments' immediate liquidity needs post disaster, and to the mitigation of the impact of disasters on the government's budget. Ex-ante DRFI tools used by developing countries include reserves or calamity funds, budget contingencies, contingent debt facilities, and risk transfer mechanisms (i.e., (re)insurance, ILS such as cat bonds). Some of these tools (e.g., calamity funds) have been used for many years.

Only recently, however, have innovations in DRFI for developing countries made tools traditionally only available in western insurance and capital markets obtainable by developing countries. A benefit of advance planning for natural disaster losses is that it forces the government to assess its financial exposure. When vulnerability to disasters is translated into monetary amounts, the sizeable return on investment from disaster risk reduction is elucidated. Financial assessment sensitizes key decision makers, such as the Minister of Finance, to the importance of disaster risk management (DRM).[5]

By clarifying the economic benefits of disaster risk reduction, DRFI complements and promotes other disaster risk reduction actions; a well-designed DRFI strategy is regarded as an essential component of a broader DRM strategy. Indeed, engagement in discussions on sovereign risk transfer typically comes after the country has made significant progress on its DRM agenda.

[5] Ibid.

DRFI does not work in isolation: it enables governments to manage residual disaster risks, those that remain after financially viable and attainable mitigation and prevention measures have already been implemented. It does not, however, physically shield populations and assets from natural hazards.

A number of recent innovative DRFI tools have forged even more explicit links between DRFI and DRM. These instruments make access to financing contingent upon engagement in DRM activities. The World Bank, for example, established a contingent credit facility in 2008 with an eligibility requirement of implementation of a national disaster risk management strategy; the Inter-American Development Bank (IADB) has since followed suit with a similar facility.

The adoption of parametric coverage (payouts are based on an independent proxy for losses, such as wind speed) is also credited with increasing investors' and reinsurers' interest in obtaining developing country risk. Investors and insurers prefer these triggers because they eliminate the potential for adverse selection and moral hazard, and are objective and transparent. Insureds, however, prefer indemnity-based insurance where the issuer of the insurance compensates the insured for its actual loss, in accordance with the level of coverage purchased. Indemnity-based insurance eliminates basis risk, or the difference between losses indicated by index measurements and the insured's actual incurred losses.

SOVEREIGN DISASTER RISK FINANCING: LESSONS FROM PRIVATE MARKET INNOVATIONS

Financial markets discriminate between good and bad ideas – as they relate to the circumstance of the moment. But some ideas, inconvenient to one set of circumstances, are enduring and may be brought back in other contexts. Winston Churchill encapsulates the spirit of this review: "The further backward you look, the further forward you can see." The catalogue of insurance innovations from the last two decades can yield new ideas for sovereign risk transfer for developing countries.

HURRICANE ANDREW: A CATALYST FOR INNOVATION

In 1992, the insurance world was shocked by the economic losses caused by Hurricane Andrew. It caused US$26 billion in contemporary dollar insured loss, devastating the Bahamas and the US states of Florida and Louisiana. Were it to repeat today, it would cause US$57 billion of insured loss. Andrew ranks as the third biggest event of the century, exposure and inflation adjusted. It caused a devastating wave of loss claims to roll through the chain of risk transfer, exhausting or depleting capital at each stage for all who had assumed part of the risk.[6] The horizontal chain across the top of Figure 1 below illustrates this chain, which can be called the "traditional" risk transfer chain.

The capital depleted by Andrew had to be replaced in this chain for the insurance market to function going forward. It was this need that resulted in the interaction of the capital markets and the global reinsurance and insurance markets, sparking a number of innovations in the last two decades.

THE REVISED RISK TRANSFER CHAIN

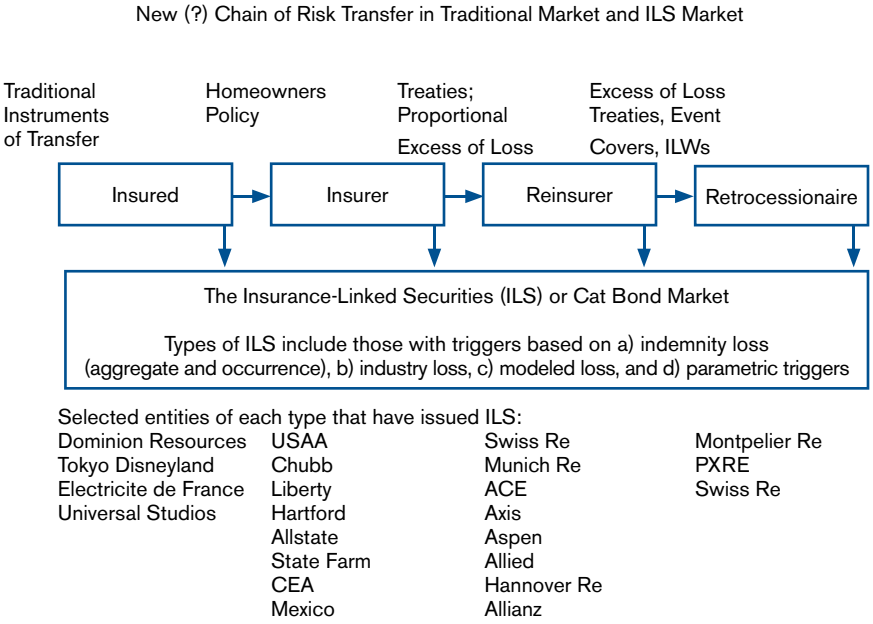
The chain of risk transfer became revised to include the vertical transfer as illustrated by Figure 1 below. Instead of transferring risk up through a chain of insurance entities, but keeping it in the insurance market, the innovation was to transfer risk directly to the capital markets. The ILS box in Figure 1 below represents the capital market.

ILS are a form of collateralized risk transfer where the insured (such as United Services Automobile Association, USAA) enters into an agreement equivalent to an insurance or reinsurance policy with a special purpose vehicle (SPV) which transfers the risk onto investors through bond issuance. The SPV has little capital but can enter into contracts to accept risk transferred from the insured. The SPV then issues bonds to investors and invests the proceeds in safe, short-term securities held in a trust account. Embedded in the bonds is a call option that is triggered by a defined catastrophic event. If the event

[6] For example, insurers who provided homeowners' policies for Florida residents, the reinsurer who provided reinsurance on these policies, and any retrocessionaires who had in turn taken a piece of the reinsurer's Florida exposure.

occurs, then proceeds are released from the SPV to the insured. In most ILS, the principal provided by investors is fully at risk, meaning that if the catastrophic event is sufficiently large, they could lose the entire principal in the SPV. In return for this option, the insured pays a premium to investors. ILS are the main instrument of transfer in the revised risk transfer chain; there are others currently in use, however, and several others have been tried.

Figure 1: Traditional and New Chain of Risk Transfer in the Insurance and ILS Markets



Source: Lane Financial LLC.

A noticeable feature of the revised chain is that the movement to the capital markets can take place by any of the types of players in the traditional chain. Electricité de France and Tokyo Disneyland have issued directly to the capital markets, showing that a fully developed chain of risk transfer is not a prerequisite for transfer into the capital markets, although it does facilitate such transactions. Of note for this paper are those governmental entities that have used the market. These include Mexico, the US states of North Carolina and Massachusetts, and the California Earthquake Authority. The fact that these entities have found it viable to access such coverage is encouraging for developing country aspirations.

TWO CASE STUDIES THAT MAY PROVIDE A ROADMAP

For developing countries to benefit from catastrophe risk transfer markets, they must circumvent the issue of under-developed private insurance markets, as they lack a traditional chain of risk transfer. One option is to emulate private market innovations by using ILS. ILS can be expensive, but there is good news for developing countries: 2010 showed strong growth in ILS issuance for property cat risk. New inflows of capital from investors and demand that is expected to outstrip supply of risk could lead to favorable pricing conditions for sovereign cat bond sponsors. Developing countries looking to capitalize on these good market conditions can learn from case studies of innovative practices from two of the biggest and most persistent ILS users, USAA and Swiss Re.

Overlapping Coverage – The Residential Re Program of USAA

United Services Automobile Association (USAA) sells homeowner, auto, and life insurance to persons who have served in the US Armed Forces. Many are retirees living in the southern coastal states of the US. Thus, USAA has exposure to hurricanes and other catastrophes affecting these states. Historically, USAA diluted these exposure concentrations by buying reinsurance along the traditional market chain.

Starting in 1996 (and annually since), USAA has also bought protection from the capital markets. To date, it has issued US$4.5 billion of ILS through the SPV Residential Re. Since 2001, all its issues have had three-year maturities. Each year, the coverage includes the ILS coverages that were purchased one and two years before; thus, they accumulate. At any point in the last few years, the three overlapping issues outstanding at the beginning of each wind season accumulated to some US$1 billion of wind protection.

By now, USAA is a familiar issuer in the market and investors compete for the bonds, as does the traditional market. This competition redounds to the benefit of USAA in the form of lower cost. Another benefit to overlapping coverages is stabilizing or smoothing costs. USAA's innovation shows a

professional approach to removing concentrations from its book of business. This strategy has creatively and adaptively evolved over time. It underscores that a well-designed program responds to circumstance and that developing countries need not be afraid to experiment.

The Cafeteria Approach – The Successor Program of Swiss Re

Creativity and adaptation are also well illustrated in this case study from Swiss Re. Swiss Re was an early issuer of experimental bonds to the market, and has been a consistent ILS user and innovator since; some of Swiss Re's well-known ILS deals are CatMex and MultiCat Mexico. The purpose here, however, is to highlight the "Successor" program as an example that could be emulated by International Financial Institutions (IFIs) or developing country governments.

Around the time that USAA was adopting overlapping three-year issuance, Swiss Re came up with an innovation that is referred to here as a "cafeteria" approach to risk transfer. This approach evolved through programs variously listed as Pioneer, Arbor, and now Successor. The essential idea of the cafeteria approach is to provide a standard set of ILS issuance as a menu of offerings. In other words, Swiss Re uses one SPV to issue bonds on a number of different risks and a number of different layers of these risks that are of interest to Swiss Re (e.g., California earthquake, Japan earthquake, or European wind). The SPV issues numerous multi-peril bonds that combine different risks and different risk layers. Investors can choose to invest in whichever risks offered in the cafeteria's "menu" most whet their appetites. The menu is standardized and is shown to the market on a fairly regular basis.

Standardization obviates the need to set up a new SPV and legal documentation each time a bond is offered – a lengthy, expensive process. The standard issue can be done repetitively and in any size. The cafeteria approach achieves standardization and economies of scale. What is striking is that the average size of issue is quite small – some are as small as US$3 million. Another benefit of this model results from regularity of issue. A standard menu has led to reverse enquiry business: investors come to Swiss Re when they have capital to assume risk instead of waiting for Swiss Re to show an offering.

Since they know the menu, all they need to negotiate is the price on the particular item of interest.

A regular menu of offerings is creative and adaptive. It suggests a model for developing countries.

INNOVATIONS IN DEVELOPING COUNTRIES: MULTICAT AND THE CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY

The World Bank has facilitated two major initiatives[7] that touch on the capital markets and the transfer of catastrophic risk. The first of these is the MultiCat Program. This program was initiated with the 2009 Mexican ILS issuance, known as MultiCat Mexico, which covered both earthquake risk in the principal urban areas of Mexico and hurricane risk of the exposed parts of its Atlantic and Pacific coasts.

In 2006, Mexico issued an ILS titled CatMex. For Mexico's second issuance, the World Bank became party to the transaction and saw an opportunity to set up a facility through which other developing countries could issue bonds. In setting up MultiCat, they adopted the "program" form utilized in ILS markets. The MultiCat Program could indeed save expense if and when other countries use the facility.[8]

Similar remarks about adaptability apply to the Caribbean Catastrophe Risk Insurance Facility (CCRIF).[9] This entity was set up in 2007 to provide catastrophic coverage for the island states of the Caribbean. The coverage was for relief funds that could be paid out immediately after a catastrophe, but that were not intended to provide a substitute for long-term relief. Caribbean nations choosing to participate had to pay a participation fee, which formed part of the capital of the CCRIF, together with an annual premium.

[7] The WB also offers a myriad of loan and other programs in its ex-ante and ex-post DRFI options.
[8] It is noted that once established, such programs are not always used multiple times or by additional sponsors as anticipated; they often have to be changed because they failed to fully anticipate new events or wrinkles in underwriting. Lloyd's of London set up a facility (Thunderbird Re) for its syndicates in 2006 that has not been used.
[9] CCRIF and MultiCat are not the only examples of such platforms. In February 2011, the IADB and Swiss Re announced a US$100 million risk transfer platform for the Dominican Republic, providing US$50 million protection for damage from hurricanes and a similar amount for earthquakes. In the future, the risk may be transferred to the reinsurance or capital markets.

The CCRIF has paid out seven claims totaling US$32 million, two for earthquakes and five for wind. The CCRIF was one of the first payers of monies, totaling US$7.7 million, after the 2010 Haiti earthquake.

CCRIF's coverage is provided in several exposure levels. Reserves provide for the first loss up to US$20 million. The next layer is traditional private reinsurance in two layers for a total of US$50 million. Above that, traditional reinsurers and the World Bank absorb the risk proportionately for US$82.5 million. The World Bank share of the top layer is 36 percent; it has assumed this risk through an excess-of-loss contract in swap form. This structure was supported by donors who established a special fund to help establish the CCRIF in its early years, in the approximate amount of US$67 million. This fund helps defray expenses and claims for running the fund while the CCRIF builds up its own capital. The initial period of support is five years but can be extended. In its first years, the donor fund has reimbursed the CCRIF for operating expenses, reinsurance premiums, and claims. In short, the donors are in the first loss position.

VISIONS FOR THE FUTURE OF DISASTER RISK FINANCING IN DEVELOPING COUNTRIES

There follows a multi-stage set of proposals that can serve as a guide to possible ways to develop future programs. The proposals lean heavily on the experience laid out by the private market above.

The Small Scale – A Caribbean Cafeteria?

The CCRIF is a ready-made vehicle for small experimentation.[10] The CCRIF only utilizes traditional reinsurance markets, but if it were to follow the USAA approach, it would tap both the traditional market and the capital market. This strategy would require a risk analysis for investors, which is already available (although this would need updating). It would also require a vehicle for issuing the ILS. This vehicle is also available through the MultiCat Program. The question, therefore, is in what form the CCRIF should issue ILS.

[10] Such experiments should be made toward the furtherance of the initiative and not at the expense of current participants.

Consider a cafeteria approach *á la* Swiss Re's Successor program. The Caribbean can be divided into multiple sections and earthquake and wind risks separated. For example, a Caribbean menu of items could contain North, West, East, and South Caribbean wind zones and North and South quake zones. These risks could then be packaged together (i.e., North Caribbean Zone Wind and Quake) or sold separately (i.e., East Caribbean Zone Wind) to investors. Properly structured, this menu could be a substitute for the risk layers currently underwritten by the private reinsurance market.[11] Issuing this ILS would provide a price competitor to the traditional market in the same way that USAA does with its Residential Re series. Also mimicking USAA, a three-year term of exposure is suggested so that reinsurance costs are smoothed over time.

Swiss Re's Successor model initially communicated its pricing to the market on a quarterly basis. Since inception, pricing has been less regular. It is suggested that rather than issue quarterly, the CCRIF should choose another regular frequency, such as semi-annual or annual, to allow investors to adjust to the idea of a regular and dependable supply of Caribbean risk they can incorporate into their portfolio plans. A regular auction of risk does not imply that the CCRIF has to offer all risks all the time. Successor does not. The CCRIF can indicate that it no longer needs, say, East Island Zone cover by setting prices low or not quoting on that particular zone. Reverse enquiry can also inform the CCRIF of demand.

The cafeteria menu is only one idea for the CCRIF. Another involves the layer of risk that the World Bank has underwritten as co-insurer and has passed on to the capital markets. In theory, the CCRIF could have issued an ILS that duplicates the layer by itself, but it would have incurred ILS issue costs. By transferring risk through the World Bank, the CCRIF has avoided this cost, but has sacrificed name exposure to the market.

[11] The CCRIF's 2010 Annual Report shows four reinsurers as participants on the risk, including Munich Re and Swiss Re.

The World Bank could also hedge its own risk by assuming the costs of issuance and using the MultiCat Facility to issue MultiCat CCRIF, an ILS for Caribbean risks. This issuance would establish the World Bank as an intermediary between developing country risk and private market risk in a way that is cost-effective for the CCRIF.

The ideas of the CCRIF issuing a cafeteria menu of bonds and of IFIs such as the World Bank intermediating to the capital markets are both precedent-setting. They translate easily to the idea of a larger platform.

To establish a platform to interface with private markets, the first requirement is risk analysis.

A Larger Frame – Global Cafeteria Coverage

The idea of a regular menu of risk offerings from the Caribbean is easily extended to the world at large. Table 1 below shows a simple example of offerings, similar to that illustrated for the Caribbean. Again, some known zones of risk exposure are listed merely for illustration purposes.

To establish a platform to interface with private markets, the first requirement is risk analysis. Earthquake in many zones can be measured by geophysical metrics (as done for MultiCat Mexico). Wind speeds can be measured at specific locations. Rainfall, temperature, and snow data are obtainable for most world regions for drought and flood measurement. Damages resulting from excessive rain, temperature, wind, or quake are more difficult to assess, however, and risk modeling firms are experts in doing this assessment. Commissioning more risk analyses would therefore be important for communicating the IFI and/or issuing countries' risk to investors. As demonstrated above, if the risk assessments are available, then transferring ex-ante risk, whether through a cafeteria approach or a specific ILS, is straightforward.

Table 1: Global Cafeteria Example

IBRD and IDA Global Cafeteria	WB I	WB II	WB III	WB IV	WB V	WB VI	WB VII
Wind							
Caribbean Islands	X				X	X	
Pacific Islands		X			X		
Bangladesh			X		X		
Flood					X		
Africa				X			X
Quake							
Caribbean					X	X	
Turkey					X		X
Pakistan							
Asia						X	X
Drought					X		

Term – Three Years, adjusted as to risk after annual reassessments of risk
Single peril bonds IBRD/IDA I through IV all binary

Source: Lane Financial LLC.

PRICING

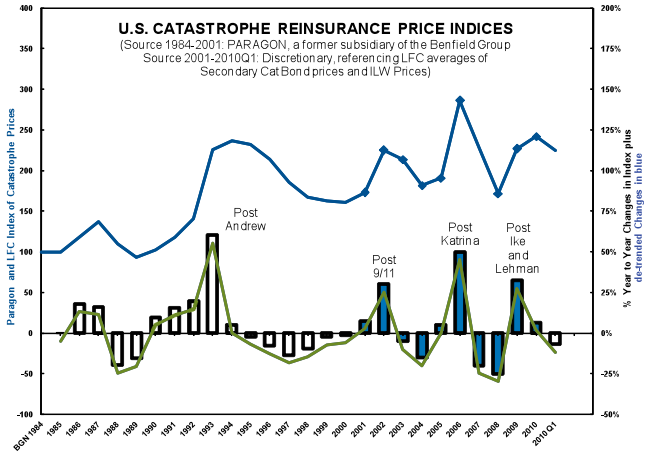
While the ideas above may be appealing and will advance the cause of ex-ante disaster financing, they are not without some downsides. Two are worth stating here. The first is that accessing the private markets brings with it the reality that the markets are volatile. Thus, as major disasters occur in the existing world of reinsured risks, private markets exhaust their capital and need to replenish to continue doing business in the future. One way in which they do that is to raise premiums. The same risk will cost more to transfer after a major disaster than it did before, even if the risk was not directly affected by the disaster. Figure 2 below illustrates the volatility of major developed world risk cost over the past two decades. Accessing the private markets will bring some part of that volatility to developing world risks.

A second caution is that the existing reinsurance markets are devoted to protecting against extreme events. They are not typically vehicles for protecting against frequent events. The most practical response to those situations is mitigation, not ex-ante insurance. This does not mean that in the aggregate there will not always be some disaster. If there are five hundred

independent one-in-fifty-year event risks that are identified worldwide, then one can expect ten such disasters a year to occur somewhere in the world. The reinsurance markets will focus on pricing the one-in-fifty-year events individually and will collectively handle the aggregate in their portfolio.

Investors are hungry for diversifying risks and will pay for them.

Figure 2: US Catastrophe Reinsurance Price Indices 1984-Q1 2010



Source: Lane Financial LLC.

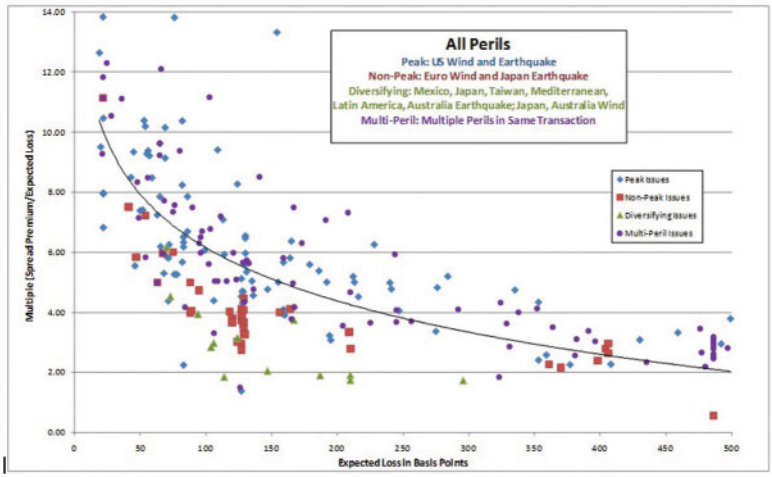
Notwithstanding these cautions, there is good news about pricing: Investors are hungry for diversifying risks and will pay for them. The evidence is in the history of issued ILS. Consider Figure 3 below.[12]

About 350 tranches of ILS have been issued since the market began in 1997. They have been issued when prices are high and when they are low, but taking all periods together, a relative view of pricing is gained by comparing the premiums paid at issue with the expected loss at issue. Dividing premium by expected loss gives a "multiple" that the issuer is paying for protection. The graph shows that the issuer always pays more than the expected loss, sometimes a great deal more. Coverage for infrequent events can be from ten to 20 times expected loss, although the cost will depend on the peril being covered.

[12] In these graphs, expected loss is limited to 500 basis points and multiple to 14 times the expected loss.

Cummins and Mahul (2009) divide the historical list of ILS into four types: peak risks (US wind and US earthquake), non-peak (Europe wind and Japan earthquake), diversifying (Mexico, Australia), and multi-peril. Figure 3 below shows the multiples for each class. A bond issued for a peak peril and an expected loss of 200 basis points would require a premium close to 4.5 times the risk, or 900 basis points. However, non-peak bonds for the same level of risk, 200 basis points, command a multiple of three times the risk, or 600 basis points. Diversifying risk ILS could be issued at a multiple of two times the risk, or 400 basis points. Since ILS from developing countries would likely be diversifying, their pricing can be expected to be at the low end of ILS experience.

Figure 3: Multiple versus Expected Loss for Cat Bond Issuance 1997-2010



Source: Authors, from Lane Financial LLC.

LONGER-TERM VISIONS

If IFIs pursue some or all of the above, then there are other experiments they could explore in the future. One such experiment recognizes that the cafeteria approach is static: the offerings are fairly similar year to year to build investor acceptance and loyalty. Over time, IFIs might find the cafeteria approach

cumbersome and not sufficiently adaptable. As IFIs may accrue shifting portfolios of risks, a more dynamic approach may be preferred. In this case, an IFI would assemble and manage risks on its own portfolio, but hedge using a CDO-like structure. The collective risks form a portfolio that can be tranched, and hedged by tranche rather than by single risk.

The existing portfolio of ILS in the private market provides an illustration. Suppose an aggregator bought all the ILS currently outstanding. The aggregator could hedge by issuing tranches of bonds for the portfolio of the bonds overall (which may shift) rather than for a fixed portfolio. Now suppose that the aggregator was an IFI and that the bonds acquired were from developing country governments rather than high-income country insurers. The IFI's risk portfolio would represent the amount of insured loss those governments expected to get after an event. As intermediary to the private markets, the IFI would be able to manage the risk and to bear the cost; individual governments may lack this ability.

INNOVATIONS IN DOMESTIC PROPERTY CATASTROPHE INSURANCE MARKETS

Sustainable private domestic insurance markets have an important role to play in DRM. Private markets reduce the strain on the fiscal budget following a disaster and prevent losses by encouraging individuals and businesses to apply loss mitigation measures. High-income countries provide examples of effective PCRI markets that developing countries can draw on to strengthen their own domestic markets.

A healthy domestic insurance market can be a conduit into the international reinsurance market, allowing countries to tap into over US$400 billion of capital[13] to aid recovery after a disaster. In the 2010 Chile earthquake, for example, domestic carriers passed on 95 percent of the insured losses to the international reinsurers.

[13] Aon Benfield Reinsurance Market Outlook (2010).

Insurance markets also indirectly influence total economic exposure (insured and uninsured). A functioning domestic insurance market can encourage risk-averse behavior in a population, as information about risk is embedded in prices. Where higher premiums indicate higher risk, insureds have an incentive to invest in risk mitigation or to avoid investing in assets located in high-risk zones.

The burden of average annual economic loss relative to GDP is higher for middle- and low-income countries. Yet these countries benefit less from private insurance markets than high-income countries, as markets tend to be less developed and have low penetration rates. In the US, the impact of catastrophic loss relative to GDP is smaller than in these countries, and is made even smaller as part of the losses are recovered from insurers.[14] Insured recoveries for major catastrophes relative to GDP are around 0.1 percent, a significant portion of average annual economic losses, which are in the order of 0.2 percent of GDP for high-income countries.

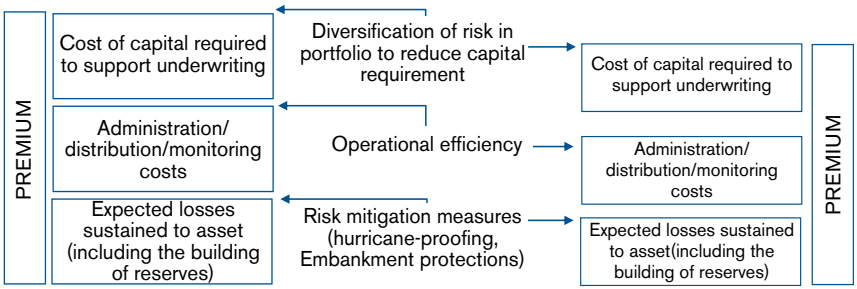
The burden of average annual economic loss relative to GDP is higher for middle- and low-income countries. Yet these countries benefit less from private insurance markets than high-income countries, as markets rent to be less developed and have low penetration rates.

LESSONS IN COST-EFFICIENCY

One challenge to the development of viable domestic insurance markets in developing countries is the cost of risk transfer. To strip costs down as far as possible, the different components that premiums must cover must be minimized. Figure 4 below illustrates these components: expected losses to the covered asset, distribution, administration, and monitoring costs, and the cost of holding capital. Risk mitigation measures provide an option to reduce the expected losses component of premiums. One way to reduce the cost of capital is to diversify the risk accepted, which reduces the amount (and therefore total cost) of capital that the insurer must hold.

[14]The exact amount of economic loss for these US catastrophes is not well recorded. A good rule of thumb might be that the economic loss is twice the insured loss. The uninsured component is borne by those affected, individuals and governments, exactly as in low-income countries where no risk transfer market exists. Also, the uninsured often receive ex-post relief from governments, again similar to developing countries.

Figure 4: Reducing the Cost Components of an Insurance Premium



Source: Authors.

Additionally, there are tried and tested models of operational efficiency within developed private insurance markets that may be transferable to the developing world. Two examples from the London market are presented below: delegation of underwriting authority and sharing of resources.

Cutting Distribution Costs: Delegating Authority

The success of the Coverholder model at Lloyd's of London illustrates how non-standard approaches to product distribution can reduce expenses. A Coverholder is an entity external to the Lloyd's market that writes local business on behalf of the market. These arrangements give the Lloyd's market access to domestic insurance markets that would otherwise not be commercially viable. Agreements are drawn up between the market and each Coverholder that delimit how the Coverholder may accept business. These agreements allow the Coverholder to offer access to a broad range of Lloyd's insurance products. Lloyd's thus leverages existing local infrastructure for product distribution. Delegated authority business accounts for almost a third of premium income at Lloyd's.

Appropriate local infrastructure and local expertise in underwriting are prerequisites for using Coverholders, which narrows the developing countries in which it could be directly applied. The concept of using a flexible risk transfer chain with satellite entities able to tap into developed market capacity, however, has broad applicability.

REDUCING THE COST OF RISK ANALYSIS

Although competition for business between insurers is fierce, insurers are not averse to collaboration where mutual benefit may be gained. As many insurers/reinsurers may participate in risk sharing on the same underlying pool of assets, operational efficiencies can be gained by sharing the cost of risk analysis for portfolio exposure management. The London Market Data Community offers an example: the 15 or so insurers/reinsurers that participate in the London Market Data Community split the cost of analyst resources on common exposures by sharing the outsourcing to a third party (RMS).

In this way, reinsurers and insurers collaborate without ceding competitive advantage, as their in-house expertise on risk analysis can still be applied post-receipt of the shared, outsourced data results. Although in the broader context, sharing analyst resources remains small, the London Market Data Community has attracted some of the largest companies operating out of London and participation has more than doubled since the scheme's inception in 2007.

Open-source initiatives for catastrophe risk models are a further step toward reducing the cost of risk analysis in both reinsurance and capital markets. Access to pricing tools underpinned by free open-source risk data can cut the cost of underwriting for insurers operating in both high-income and developing countries. By sharing expertise and data, insurance and reinsurance companies ultimately benefit from a common resource beyond the scope of potential individual achievement.

The Global Earthquake Model (GEM) is one such initiative that is well underway. The innovative elements of the project are that the resulting global earthquake model will have a flexible interface to expand the potential user base, will be open-source, and is being constructed by a community of stakeholders across the globe and the private and public sectors. Several private players, including Munich Re, Zurich Financial Services Group, and broker Willis, founded the initiative. It has attracted broad participation from both the private and public sectors, with support from 18 participating countries and numerous public sector organizations, including the World Bank.

Many more open-source initiatives are currently underway in risk modeling, including a drive by the IFIs to enhance awareness of risk through "Open Source." In this initiative, the experience of various agencies will be collected and made publically available. The objective is to collect risk assessment worldwide so that, for example, earthquake risk in Turkey, drought risk in Africa, flood risk in Bangladesh, and bird flu risk in Asia are all assessed and disseminated.

The data produced by open-source initiatives could be a catalyst for the development of property catastrophe insurance markets in developing countries, where historical records for loss experience are typically sparse and insurers need to look to other sources of data to inform pricing.

INNOVATIONS IN DISASTER MICROINSURANCE FOR THE MOST VULNERABLE

Disaster microinsurance is ripe for the study of innovation. Driven by both the public and private sectors and tested in diverse contexts (with even more diverse outcomes), the field of disaster microinsurance is evolving. New understandings and solutions are notable on many fronts: product development, distribution channels, client education, etc. These developments are important for establishing disaster microinsurance as a substantive tool for protecting low-income populations against natural disasters; while there is great optimism about disaster microinsurance, its growth has been limited.

DISASTER MICROINSURANCE PROGRAMS WITH POTENTIAL

Recent disaster microinsurance programs test new ways to protect their target populations. Lessons from these innovations can improve disaster microinsurance services for low-income populations. Note that new innovative pilots are also under development; for example, in late March 2011, a consortium of partners announced the formation of Microinsurance Catastrophe

Risk Organization (MiCRO), a disaster microinsurance facility for Haiti's micro-entrepreneurs that will test a new approach to minimizing basis risk in its parametric coverage.[15]

A Holistic Approach for Reduced Vulnerability

The Horn of Africa Risk Transfer for Adaptation (HARITA) Program offers a holistic approach to risk management. The program integrates risk transfer (i.e., insurance), risk reduction (i.e., improved agricultural practices and conservation activities), prudent risk-taking (i.e., credit), and risk reserves (i.e., savings). HARITA is being piloted in Ethiopia and involves a large number of partners from both within Ethiopia and the international community.[16] HARITA targets highly vulnerable rural families, many of whom are enrolled in Ethiopia's Productive Safety Net Program (PSNP).[17]

HARITA aims to provide a package of disaster risk reduction and management services designed to address the core interests of its clients. Farmers are central participants in the design of the risk reduction package. They suggested one of the program's central innovations: enabling the poorest farmers to pay in kind for coverage with labor. PNSP participants can pay for insurance through disaster risk reduction activities in their village that reduce their own vulnerability to future extreme events.[18]

Another related innovation of HARITA is providing comprehensive disaster risk reduction, risk transfer, credit, and savings to targeted food-insecure populations. Integrating insurance with a food security program allows insurance to address farmers' immediate concerns and enables them to consider longer-term issues.[19] In the long term, this integrated approach could help increase the resilience of vulnerable rural populations to climate change.

[15] MiCRO's founding partners are Swiss Re, Caribbean Risk Managers Limited, Guy Carpenter Micro Risk Solutions, Mercy Corps Development Agency, and Fonkoze Microfinance Institution.
[16] Major Partners: Relief Society of Tigray, Dedebit and Credit Savings Institution, Nyala Insurance Company, the Ethiopian Productive Safety Net Program, the Government of Ethiopia National Meteorological Agency, Swiss Re, Mekele University, Oxfam America, and Coumbia International Research Institute for Climate and Society.
[17] PNSP is a safety-net program that serves eight million chronically food-insecure Ethiopian households.
[18] Risk reduction activities include tree, grass, and bush planting; creation of stone terraces for soil and water conservation; soil fertility management through composting; and spate irrigation.
[19] Suarez and Linnerooth-Bayer (2010).

Effective and Efficient Distribution through Mobile Technology

Kilimo Salama, or "safe agriculture" in Swahili, is a weather index-based insurance program for Kenyan farmers that embraces mobile phone technology. Mobile phones are used for selling, tracking, and distributing payouts. It was launched in 2009 through partnership between the Syngenta Foundation for Sustainable Agriculture, African insurance company UAP, and mobile provider Safaricom.

The insurance protects a farmer's investment in inputs. Policies are paid up front when inputs are purchased and last for one growing season. The premium (10 percent of the cost of the purchased input) is shared 50 percent by the farmer and 50 percent by the agribusiness; this private sector partnership is another innovative feature of the program.[20]

Kilimo Salama was the first agricultural microinsurance program to use agricultural supply dealers to distribute policies.[21] Participating agro-dealers pay a US$60 deposit on a mobile phone with an application that registers the policy and sends an immediate confirmation to the purchasing farmer. To register a policy, the agro-dealer references a list of codes that identify the product type, size, and insurance type. The agro-dealer scans the relevant codes with the mobile phone's camera and sends a registration request. The farmer receives a SMS confirming this registration.[22] The agro-dealer collects premiums and transfers them in bundles via SMS to the insurance company.

Throughout the growing season, insured farmers (around 11,000 in 2010) receive location- and crop-specific text messages with farming advice. In case of a payout, all phone numbers linked to a weather station receive a confirmation of their payout via SMS, and the payout is made directly via MPesa, a mobile money transfer service. In September 2010, the program paid out for the first time: Over 100 farmers in the Embu Region of Kenya received payouts ranging up to US$30.

[20] In 2010, its second year of operation, participating companies included MEA Limited (fertilizer) and Syngenta Chemicals East Africa Limited, and Seed Co. According to Kilimo Salama, a number of other agribusinesses have indicated their interest in participating in the scheme.
[21] In 2010, almost 40 agro-dealers in five Kenyan regions distributed the policies; there are an estimated 8,400 agricultural supply stockists in Kenya.
[22] The farmer can also access his or her policy data by sending an SMS to the insurance company.

In November 2010, the International Finance Corporation's (IFC) Global Index Insurance Facility (GIIF)[23] conferred a grant of US$2.4 million to Kilimo Salama to scale up the program. While costs such as strengthening Kenya's weather station infrastructure pose challenges to the scaling up of the program, its innovative use of mobile technology means that transaction costs of distribution will remain minimal.

The First Flood Microinsurance

The insurance product was a simple protection card, similar in size to a telephone card which carried insurance coverage.

In 2009, Indonesian insurance company Asuransi Wahana Tata, Munich Re, and German aid agency Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)[24] launched the first-ever flood microinsurance pilot in Jakarta. The program aimed to provide affordable, easy-to-understand, and non-bureaucratic insurance coverage for a risk known to be very difficult to assess and insure.

The insurance product was a simple protection card, similar in size to a telephone card, which carried insurance coverage. Residents of the pilot area could purchase an unlimited number of insurance cards; cards cost slightly less than US$5 and ensured a payment of US$24.50 if the waters rose above a certain level at the Manggarai Water Gate in Jakarta during the rainy season. In case of a triggering flood, policyholders could redeem their insurance cards for payment within about five days of the event. Payouts could cover asset losses and livelihood expenses such as medical expenses and food.

Although lauded for its simple design and availability of flexible coverage, the flood insurance product had limited outreach. In its first month, approximately 50 policies were sold, and sales did not increase significantly afterward. One issue cited by community members in the months following the launch was that they did not feel that flood water level at the Manggarai Water Gate accurately reflected their own losses (i.e., basis risk). They also

[23] IFC's GIIF program was established in 2009 to assist the development of index-based insurance for natural disasters and weather risks in developing countries.
[24] On January 1, 2011 GTZ was merged with two other German development services to form the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

felt that the trigger level was set too high and demanded insurance for more frequent events. For this and a number of more practical reasons (i.e., an urban drainage project that attenuated flooding problems in the area), the pilot was discontinued in 2010.

This case raises interesting questions about design and development of index-based insurance products. The project appeared well positioned to provide a valuable coverage for Jakarta residents – it addressed a compelling infliction on the community, involved community members in its design, and adopted a straightforward product design – but demand was weak. What can disaster microinsurance programs learn from this project? How can programs balance the demand for coverage that pays out frequently with insurability constraints? How can educational messages on insurance be effectively conveyed to the population? Is it feasible for insurance to be part of the response to recurrent urban flooding?

Payment in Advance of Disaster

El Niño is an unusual warming of the tropical Pacific Ocean responsible for bringing catastrophic rainfall and flooding (among other weather patterns) along the northern coast of Peru. In the coastal region of Piura, a project is using highly predictive sea surface temperature values associated with this event to design innovative insurance for the damages and disruption that El Niño inflicts on Piura's economy.

GlobalAgRisk Inc., along with numerous other stakeholders, is leading the effort to create an index based on sea surface temperatures in the Pacific; this unique index signals a severe El Niño event months in advance. It enables insurance that disburses a payout based on a seasonal prediction, so policy-holders receive payment months in advance of catastrophic weather. Payouts can be used for risk mitigation and adaptation strategies to reduce losses and disruptions from the forecasted event.[25]

[25] See GlobalAgRisk Press Release (2009).

This product is the first forecast index insurance to receive regulatory approval. It is being targeted at risk aggregators, such as rural lenders, primarily to increase access to credit in rural areas of Peru.[26] The development team has received funding to develop and pilot alternative applications, such as other business sectors and households. The development of El Niño index insurance has sparked consideration of other applications of forecast index insurance and its linkage to ex-ante risk reduction.

CONCLUSION

The last two decades have seen a flurry of risk transfer innovations, driven by the private sector but also by the international community at large. The result is a broader set of options for disaster risk financing and insurance at all levels in developing countries.

The first interactions of the insurance and capital markets have triggered a number of innovations that hold significant promise for cost-efficient access to international capital markets for governments. Examples from the ILS market show that an established domestic insurance market may not be a prerequisite for risk transfer by sovereign entities in developing countries. Successful transactions such as the Residential Re and Successor series give hope that creative structuring can make products attractive to investors and bring down the cost of transfer.

The traditional risk transfer market has also found ways to continue evolving, with innovations in distribution and operational efficiency that could deepen non-life catastrophe insurance markets in developing countries. Could current open-source initiatives form the base of pricing tools used in domestic PCRI markets in the developing world? Could Western market operators adapt the Coverholder model of distribution to find a commercially viable path into developing PCRI markets?

[26] Suarez and Linnerooth-Bayer (2010).

Finally, partnerships between the private sector and public entities have been testing creative disaster microinsurance solutions for low-income populations. While most of these initiatives are still to be proven sustainable, the continued application of innovative ideas to the problem of disaster insurance for low-income populations will hopefully yield many effective, sustainable solutions in the future.

While only a few recent cases of innovation have been discussed in this paper, other examples of creative disaster risk financing efforts are readily available. Lessons from the successes and challenges of these can be dissected, sorted, and reconfigured in new combinations and contexts. There remains, however, a considerable amount of work to be done to increase the financial resilience of developing countries in an era of increasing catastrophes. Creativity, collaboration, and constant questioning of decisions will be central to identifying new solutions.

This paper has shown that innovations in product design, risk assessment, intermediation, and delivery mechanism can help overcome the challenges faced in the development of cost-effective disaster risk financing and insurance solutions in developing countries. Most of these innovations have a public good component and contribute to improving risk market infrastructure. The establishment of an International Platform for Disaster Risk Financing and Insurance, financed by both the public and private sectors, could further promote and spread such innovations. Its mandate would be to offer technical assistance and public goods and services for the development of disaster risk market infrastructure to the developing countries that want to promote disaster risk financing and insurance solutions as part of their overall disaster risk management agenda.

Glossary	
Adverse Selection	Adverse selection occurs when potential insurance purchasers know more about their risks than the insurer does, leading to participation by high-risk individuals and nonparticipation by low-risk individuals.
Average Expected Loss	Expected loss per year when averaged over a very long period (for example, 1,000 years). Computationally, AEL is the summation of products of event losses and event occurrence probabilities for all stochastic events in a loss model.
Alternative Risk Transfer	Refers to any non-traditional form of insurance risk transfer. Catastrophe bonds are a form of ART.
Basis Risk	The risk, with index insurance, that the index measurements will not match individual losses. For example, some households that experience loss will not be covered and some households that do not will receive indemnity payments.
Catastrophe Bond	High-yielding, insurance-linked security providing for payment of interest and/or principal to be suspended or canceled in the event of a specified catastrophe such as an earthquake.
Diversification	
	Refers to the variety of assets within a portfolio in terms of its geographical or sectoral spread, or in terms of its credit quality. In general, risk is reduced as portfolio diversification increases.
Expected Loss	The expected amount of loss to an insurance-linked security expressed as a probability.
Indemnity	The amount payable by the insurer to the insured, in the form of cash, repair, replacement, or reinstatement, in the event of an insured loss. This amount is measured by the extent of the insured's pecuniary loss.
Moral Hazard	In insurance, the problems generated when the insured's behavior can influence the extent of damage that qualifies for insurance payouts. Examples of moral hazard are carelessness, fraudulent claims, and irresponsibility.
Parametric Insurance	Parametric insurance makes indemnity payments based not on an assessment of the policyholder's individual loss, but rather on measures of a parametric index that is assumed to proxy actual losses.
Probable Maximum Loss	The largest loss believed to be possible for a certain type of event in a defined return period, such as 1 in 100 years, or 1 in 250 years.

Glossary	
Reinsurance	When the total exposure of a group of risks presents the potential for losses beyond the limit that is prudent for an insurance company to carry, the insurer may purchase reinsurance (that is, insurance of the insurance).
Risk Layering	The process of separating risk into tiers that allow for more efficient financing and management of risks.
Risk Pooling	The aggregation of individual risks in order to manage the consequences of independent risks. Risk pooling is based on the law of large numbers. In insurance terms, the law of large numbers demonstrates that pooling large numbers of roughly homogenous, independent exposure units can yield a mean average consistent with actual outcomes. Thus, pooling risks allows an accurate prediction of future losses and helps determine premium rates.
Total Return Swap	Contract used by investors to exchange (swap) a fixed payment for a certain portion of an insurance company's (the swap counterparty) losses.

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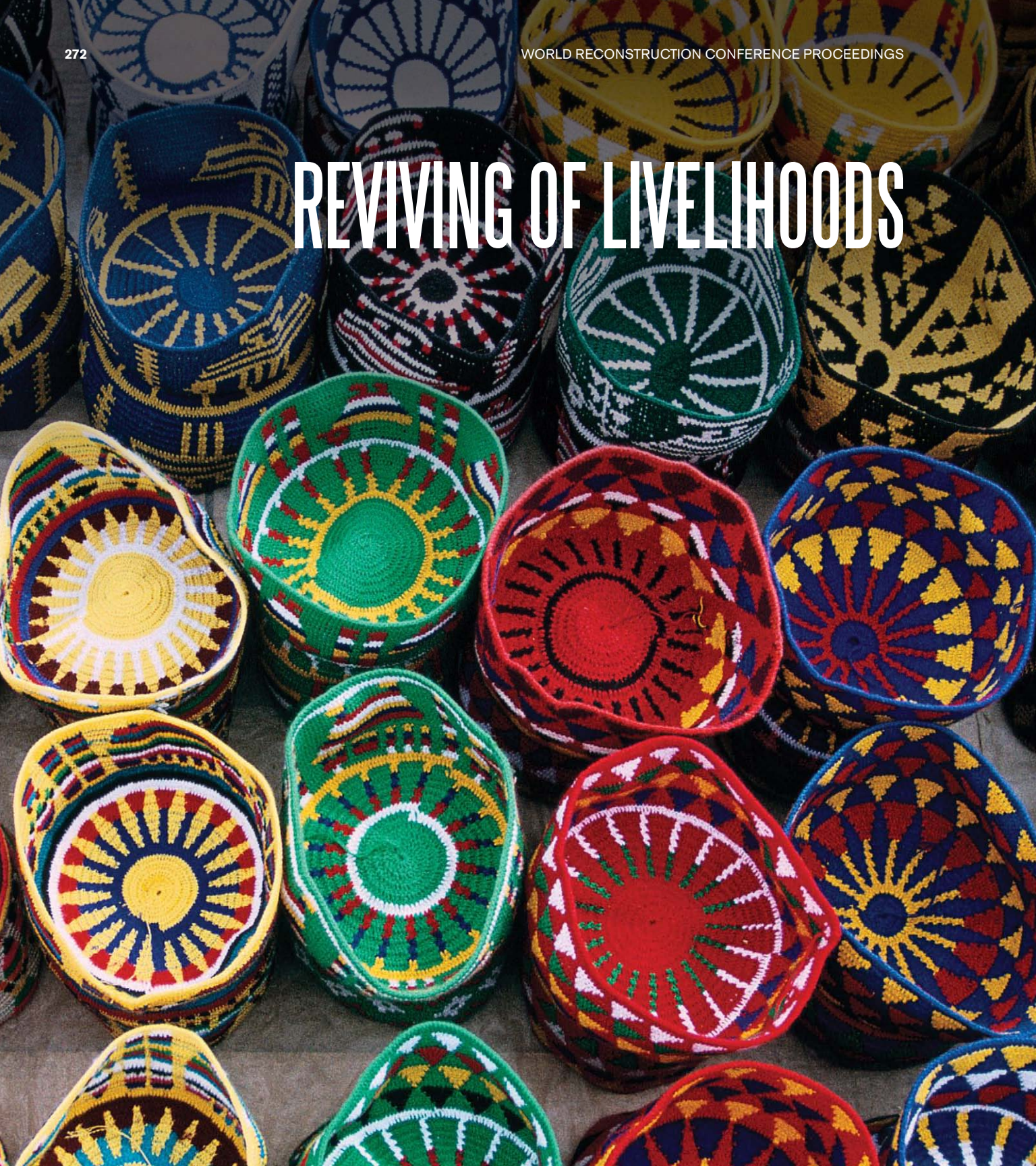
REVIVING OF LIVELIHOODS



AND LOCAL ECONOMY

by Tara Vishwanath[1]

INTRODUCTION

Natural disasters typically destroy livelihoods; the assets and resources that people rely on are gone, leaving them with few means to survive. Though livelihoods are usually decimated in a disaster, they are not the focus of most immediate relief efforts. In the hours and days that follow a disaster, international organizations tend to focus on access to clean water, the delivery of food aid, and access to emergency health care and short-term shelter. These types of goods and services are the most urgent requirements to save lives in the immediate aftermath of a disaster. In many cases, this is followed by early reconstruction efforts through large infrastructure projects rebuilding roads, housing, and bridges. What is often left unaddressed is the need for the immediate revival of the local economy, markets, and livelihoods. Left unaddressed, this often leads to a longer and more difficult transition to long-term recovery.

Though livelihoods are usually decimated in a disaster, they are not the focus of most immediate relief efforts.

In this paper, we argue for an increased focus on livelihood support in the aftermath of a natural disaster to rebuild markets and income-generating activities while distributing the goods and services that people need. By injecting cash and assets into disaster-affected areas, it is hoped that the normal economic cycle will be revived by rejuvenating markets and bringing people back to work. Thus, the underlying principle behind such disaster response programs goes above and beyond immediate relief to help communities rebuild more quickly and contribute to long-term development.

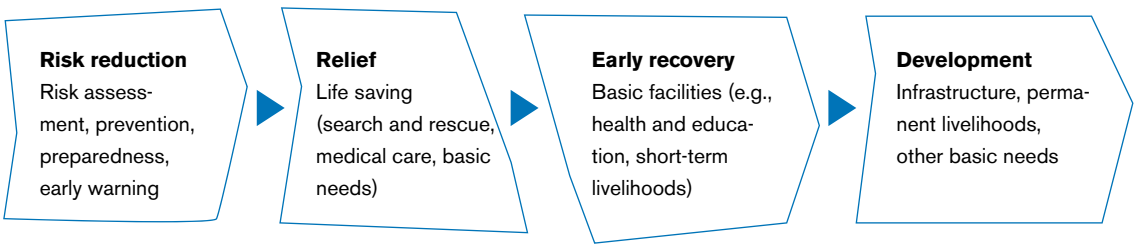
[1] This paper benefitted from background literature review and significant inputs to the final draft from Malika Anand and substantial comments from Nandini Krishnan.

The structure of this paper is as follows: in the first section, we explore disaster response concepts and argue that focusing exclusively on relieving hunger and health emergencies can undermine the resumption of livelihoods. Next, we explore some livelihoods approaches to disaster response, and consider the advantages and disadvantages of each. In section three, we outline some of the design features of livelihoods programs in detail, and in the final section we make a case that in countries where systematic and relevant data collection takes place regularly pre-disaster, the response in terms of the choice of appropriate livelihood programs for local conditions is facilitated and expedited. The presence of such systems is also an advantage in identifying vulnerable groups who need swift and targeted assistance. We argue that governments and agencies involved in disaster response need to invest in data and institutions ex-ante to facilitate the design of effective disaster response programs.

1. CONCEPTUALIZING DISASTER RESPONSE

Traditionally, disaster response programs have been divided into four phases: preparedness, relief, rehabilitation, and longer-term development. The first stage, preparedness, includes early warning systems and risk assessments for preventing and mitigating the impacts of shocks. The second, relief, focuses on "life-saving" activities through the delivery of urgently-needed food and health services to vulnerable populations. The third phase, rehabilitation or early recovery, aims to bring populations back towards normalcy, minimizing the effects of the disaster and restarting basic programs such as service delivery and livelihoods. The last stage, development, includes recovery and reconstruction programs and traditional economic and social development programs administered by government and international agencies (Amin and Goldstein 2008).

Figure 1. Stages of Disaster Response



Typically, the four phases of this continuum are usually implemented by different kinds of organizations, each with distinct focuses and mandates. The four phases are meant to be implemented in sequence, starting with preparedness and then moving to emergency relief, rehabilitation, and finally development. As different agencies move in and out of implementation, there is a risk of a lack of coordination and continuity and the loss of critical information from one stage to the next.

This four-phase conceptualization of disaster response has also been critiqued for artificially separating relief efforts from livelihoods and longer-term development goals, and for creating a framework in which relief efforts can undermine development (Buchanan-Smith and Maxwell 1994). These critiques advocate for designing relief projects that can actually support longer-term development through the use of livelihoods support. This critique of traditional disaster response programs can be seen through two examples: food aid and reconstruction.

Traditional relief programs typically distribute large quantities of food aid in the days after a disaster. However, if the problem is not availability of food but access to it, then this food aid can seriously damage markets. By dumping food in markets where "there is no actual food shortage, we may adversely affect local markets, reduce food prices, and therefore increase the vulnerability of food producers and traders" (Creti and Jaspars 2006).

Similarly, in the case of large-scale rebuilding of infrastructure and housing, traditional relief projects usually rely on contractors that do not hire local labor for the sake of speed and organizational ease. This reliance on foreign labor eliminates potential spillover effects that could be accrued through local procurement of labor and materials. This is especially true in immediate debris clearing and other initial reconstruction efforts, which could offer an ideal opportunity for delivering assistance through workfare programs. Thus, reconstruction efforts could have important employment effects if labor and materials were sourced locally, but in most cases the urgency to get things done quickly results in the use of external providers, thereby undermining the restoration of livelihoods and markets.

To revive markets and livelihoods in a post-disaster environment, we argue for including programs such as cash and asset transfers alongside other disaster response programs. These programs will ensure that markets and jobs are restored alongside physical infrastructure, thereby contributing to the longer-term development of these areas. By including a livelihoods approach in disaster response, we can improve the likelihood of a more sustainable and quicker recovery.

2. INTEGRATING LIVELIHOODS INTO DISASTER RESPONSE

What does a livelihoods approach to disaster response imply? This approach involves providing cash, goods and services, assets, or a combination of these to those affected by the disaster to quickly restore livelihoods and jumpstart market functionality. This often takes the form of cash for work programs to rebuild infrastructure, or in-kind grants of assets to restart income-generating activities. The idea is to create a virtuous cycle through which people obtain the goods and services they need, but to do so in a way that restores some degree of normalcy and cash flow in the market.

Though this notion seems conceptually innovative, it is not new: "linking relief and development, in various guises, was an important theme emerging from the analysis of the food crises in Africa in the 1980s" (Buchanan-Smith and Maxwell 1994). While these food crises may not have been caused by natural disasters, the spirit of a more sustainable approach to immediate relief efforts is the same. However, there are very few examples where attempts to link relief and development were made explicitly, and even fewer where they have been linked successfully. Figure 2 cites a few such examples where livelihood support programs were integrated into a broader relief and reconstruction effort.

Figure 2: Examples of Livelihood Support Programs in Disaster Response[2]

Country	Population covered	Components	Amounts
Maldives (2004 tsunami)	All affected households (one-fifth of population)	Cash grant	$39-$117 per person depending on damage (equivalent to 2 to 6 weeks of average consumption)
		In-kind	
Pakistan (2005 earthquake)	250,000 households (30% of the affected)	Cash grant	$300 per household for livelihood support
		Payment for death and injury	$1,660 to next of kin
		Payment for housing	$2,900 per house destroyed $1,250 per damaged house
Sri Lanka (2004 tsunami)	250,000 households in first round (all affected households covered)	Cash grant	$200 per affected household, plus grants for housing reconstruction
Turkey (1999 earthquake)	206,145 households	Accommodation	$4,000 for accommodation aid and $1,430 per house for damage repairs
		Repair	
		Death and disability	$1,790 to next of kin and $950 (on average) for disability

Source: World Bank staff, based on Heltberg (2007).

3. LIVELIHOOD SUPPORT PROGRAMS

Providing basic income and employment support is often an essential component of the post-disaster rebuilding efforts. The primary objective of such livelihoods-based policies is to protect the most vulnerable households in the affected communities. These policies can also have benefits in terms of rejuvenating local economic activities by creating purchasing power in affected areas, as well as rebuilding severely damaged basic infrastructure by integrating some reconstruction activities with social protection programs. We focus on three main approaches in this regard – asset transfers, cash transfers, and cash for work or public works programs. Drawing on the experiences of several countries, this section describes each of these and illustrates when they might be appropriate.

[2] World Bank (2010).

Asset Transfers

Asset transfers are designed to help replace machinery, livestock, and housing that may have been destroyed in a natural disaster. Knowing that 70% of people living along the coast in Aceh made their living through fishery (Lowther et al. 2006), donating boats was a popular and seemingly sensible way to help people get back on the feet. Other examples of post-disaster asset transfer include livestock donation and the supply of seeds and other agricultural inputs to farmers.

While asset transfer programs are designed to move towards relief that supports livelihoods, they often suffer from poor identification of needs. For example, in post-tsunami Aceh, people had plenty of boats, but they didn't have the nets needed for deep-sea fishing (ILO 2005). As a result, the fishermen were only able to use the boats for shallow-sea fishing, which did not generate much income. Other reports found "fishing equipment that did not conform to existing sea conditions [and] seedlings that were not compatible with the climate" (World Bank 2008). While community involvement might have led to better asset identification, in the aftermath of a disaster it is extremely difficult to gather such information and accurately assess the communities' most urgent needs.

Another potential weakness with asset transfer programs is the extent to which they often focus on the livelihoods the community was engaged in before the disaster, without a clear understanding whether those livelihoods were stable or profitable to begin with. In fact, in most poor communities, we find an oversupply of labor in traditional livelihoods (Regnier et al. 2008). For example, it is a common story in rural areas that there are too many young men to farm the limited arable land in a village and they must migrate to the city to find work. Asset transfer programs can often exacerbate this oversupply problem, by concentrating asset transfers in traditional, existing livelihoods. This concentration can lead to extremely low income levels and unsustainable exploitation of natural resources resulting in overfishing or deforestation.

A final weakness of asset transfers is the way in which they often bypass market mechanisms. Rather than utilize local markets, asset transfers are organized by donors and development organizations. As such, distributors and traders who may have previously been engaged in facilitating the sale of assets are now excluded from that process. By sidestepping these market mechanisms of procurement, asset transfers may miss an opportunity to support some livelihoods.

A final weakness of asset transfers is the way in which they often bypass market mechanisms.

On the positive side, asset transfers can be easy to design and monitor relative to other forms of post-disaster livelihood programs such as cash transfers. For example, they can be easy to design when one knows the predominant livelihood in the area. In Indonesia, knowing that fishing was the primary activity in the area made it easy for donors to provide assets to support that activity. Asset transfers are often easy to monitor since a program officer has only to verify that the asset was delivered to the chosen household.

One way to avoid some of the disadvantages of asset transfers is to use vouchers. Vouchers are certificates issued by the government or a donor agency that "provide access to pre-defined commodities [that] can be exchanged in a special shop or from traders in fairs and markets" (Creti and Jaspars 2006). Using vouchers instead of directly delivering assets can help alleviate some of the disadvantages of asset transfers by giving beneficiaries some choice among the commodities they get and by restarting market behavior in which individuals go to stores to procure goods (albeit with a paper chit instead of cash). This, in turn, can start activity between shops and distributors to ensure that goods and services reach those who need them. However, it should be kept in mind that vouchers may exclude the most vulnerable, who may lack information or be unable to travel to the market to redeem their voucher.

Cash Grants

A cash transfer program developed in response to a natural disaster offers direct assistance in the form of cash to the target group. Cash grants are "the provision of money to targeted households, either as emergency relief to meet their basic needs for food and non-food items, or as grants to buy assets essential for the recovery of their livelihoods" (Creti and Jaspars 2006). Cash grants are

often designed for a finite period until economic activities pick up and generate employment opportunities. Given the magnitude of the disaster and the need to assist the affected and vulnerable households swiftly, developing a quick cash transfer program that gets the needed cash into the hands of the affected population has some clear advantages. The indirect effect of creating purchasing power and markets in affected areas was visible, for instance, in the case of cash grants in Pakistan from the quick spot-check assessments conducted. By giving affected populations cash rather than in-kind donations, a cash transfers program allows beneficiaries to purchase the goods they most urgently need while giving households greater choice over the goods and services they purchase. This flexibility in purchasing also makes cash a more efficient transfer than physical assets. Beneficiaries often treat food aid or assets as a sort of currency, selling it to purchase goods they prefer. In Afghanistan, an evaluation found that beneficiaries were selling the commodities they received for three to six times less than it cost to deliver them (Harvey 2005), thus making these commodities an extremely inefficient cash transfer.

A cash transfers program allows beneficiaries to purchase the goods they most urgently need while giving households greater choice over the goods and services they purchase.

In addition, cash transfers can help rebuild markets and restore trade "by encouraging traders to move supplies from areas of food surplus to areas of food deficit" (Creti and Jaspars 2006). In this way cash transfers have additional livelihood benefits relative to asset transfers. While asset transfers can jumpstart income-generating activity at the household level, cash transfers have the additional benefit of initiating trade and distribution activities that are essential to normal market-based economies.

From a programmatic point of view, cash can be easier to administer than assets in some ways. Provided some financial infrastructure is in place, cash is usually cheaper and faster to deliver than physical assets, which are illiquid by definition and may be difficult to move when physical infrastructure has been destroyed. Cash can also help avoid instances in which program design is driven by available resources rather than by need. Too often, the availability of tractors or fishing nets drives the choice of an asset transfer. With cash, this design flaw can be avoided. Finally, evidence shows that people prefer cash; evaluations have shown that people can receive less cash than the value of the in-kind asset in question, and be equally happy (Harvey 2005).

Finally, perhaps counter-intuitively, cash has the advantage of protecting assets. In the wake of a disaster, people may be forced to "adopt coping strategies that are damaging to their livelihoods or dignity" by selling off whatever few assets they have left or engaging in undignified labor (Creti and Jaspars 2006). By giving people cash, livelihoods programs may be able to protect vulnerable households from unnecessarily selling assets in a way that illiquid asset transfers cannot.

While the advantages to cash transfers are compelling, some development organizations are resistant to utilizing them. To start, some may feel cash is difficult to target because everyone wants cash and can make a case they need it. This concern is linked with a fear that the cash will be spent on the "wrong things" such as tobacco, alcohol, or entertainment (Creti and Jaspars 2006). From a programmatic point of view, cash may be more susceptible to corruption, since it is easier to move and harder to track. It may also involve security risks for program officers who become vulnerable to robbers. And finally, cash injections may cause inflation in markets where goods are not readily available.

Creti and Jaspars (2006) make a strong case that these fears do not play out in practice. While they caveat that experiences with cash transfers have, thus far, been small in scale, they argue that these risks are minimal in practice. Past experience has shown that beneficiaries have spent the money appropriately, mostly on food, with some spending on clothes, repayment of loans, livestock, and agricultural inputs. Furthermore, they note "that markets are often surprisingly robust and traders do respond to increased demand," thus supporting the view that cash can help rebuild markets without fear of inflation. However, as we will see later, inflation has been a problem in some isolated markets such as Aceh, following the tsunami.

Cash for Work

A cash for work or public works program offers several appealing features that can help address challenges arising from natural disasters:

- It provides income transfers to affected populations and can help households meet consumption shortfalls and other immediate needs.

- The program can help create or restore much needed infrastructure in the disaster-affected areas through, for example, debris removal, repair of community water supply and sanitation schemes, repair or construction of public buildings such as community centers, and minor road repairs. As a result, cash for work programs can restart economic activity and restore infrastructure simultaneously.
- The program can be easily targeted to specific geographic areas. The affected communities and poor households can benefit directly from the transfer of income and indirectly from the physical assets that the program creates and/or maintains.
- The potentially labor-intensive nature of public works programs and the low level of income of intended beneficiaries imply that the program can target the neediest people through self-selection and incur limited administrative cost. Overall, the program is flexible, can be easily scaled up, and can mobilize resources quickly.

However, such programs are only appropriate when the assets constructed are valuable to the community; "the criticism most frequently raised is that too many of the projects are useless, merely digging holes and filling them up again, or constructing roads from nowhere to nowhere" (Heltberg 2007).

Public works programs have been widely used in the aftermath of natural disasters and major conflict. Countries such as Indonesia, India, Madagascar, Ethiopia, Kenya, and Honduras all implemented similar programs to counter the impact of various shocks. In Indonesia, some 18,000 participants were involved in public works programs in around 60 villages after the tsunami. It made quick and safe disbursement of assistance possible. Assistance was delivered on a widespread basis in emergencies and had positive impacts at the individual and community level.

4. DESIGNING A LIVELIHOOD SUPPORT PROGRAM

Choosing the design of a livelihood support program must be shaped by the type of disaster and local conditions. For instance, public works programs and asset transfers can work if enough people in the affected area can work and sufficient infrastructure survives the disaster so that goods can be moved into the area. For example, in a tsunami, morbidity patterns are such that many people die and assets are lost, but most survivors are left physically unharmed (Amin and Goldstein 2008). With some support, these survivors may be eager and capable participants in a cash for work program. On the other hand, disasters such as floods and earthquakes leave many injured and at risk of diseases such as cholera. In these cases, livelihood approaches that demand the labor and participation of affected populations may not be an appropriate choice.

One important consideration in choosing the type of livelihood support program is the pre-existing diversity of livelihoods in the affected area. Many people use a menu of income-generating activities based on the season and available resources, rather than concentrating on one activity. "Many poor households have a basket of livelihood strategies they employ depending on economic, resource, and environmental conditions. Rather than being specialized, and therefore vulnerable to a sudden change, many households in coastal communities are well situated to adapt to changing circumstances" (Pomeroy et al., 2006). This strategy is precisely what makes people resilient in a disaster and livelihood support should strengthen and support this strategy.

Another important consideration is who the affected population is and how extensive the assistance will be. If the intended beneficiaries are extremely vulnerable, i.e., the elderly, the handicapped, and young children, cash grants may be the appropriate choice. Cash for work programs are an appropriate choice when the government has "shovel-ready" projects that can be rapidly organized and when the population is healthy and stable enough to work. Thus, by design, cash for work programs may be difficult to distribute equitably.

Once the choice of the type of livelihoods support has been made, there are a number of design features to consider that must be adapted to the local

In general, cash transfers are appropriate when:

- The government has sufficient capacity to effectively design and implement a program;
- People are accustomed to purchasing a significant proportion of goods and services through market mechanisms (rather than through barter);
- Adequate supplies are available for purchase;
- Markets are physically accessible and functioning; and
- Cash can be delivered safely and effectively

(Creti and Jaspars 2006, World Bank/GFDRR 2010).

context. One must decide who to target, benefit levels, timing/sequencing, how to coordinate with other programs, a monitoring plan, any training components, and an exit strategy.

Targeting

The first decision is to decide who will benefit.

Temporary cash support programs can be universal for all disaster-affected areas, targeted further geographically depending on the degree of impact or targeted at the household level on those who have lost their capacity to earn a livelihood as a result of the disaster. Geographic targeting would be appropriate in areas where the damage is extensive and most households are affected. In areas where the affected population is dispersed, household-level targeting becomes necessary. Targeted beneficiaries at the household level include all those who are displaced and living in temporary shelters or relief camps, as well as other households who are especially vulnerable (for example, households headed by the elderly, widows, or families who have experienced the death of the main income earner). Additional criteria for identifying the most vulnerable among those affected should be developed by the authorities and informed by a careful damage and needs assessment.

The need to reach a large population in a very short period of time often implies that universal benefit for those in the affected area may be an appropriate measure compared to the adoption of sophisticated targeting mechanisms. However, it is important to recognize that such universal benefit has to be time-bound and will need to be transitioned to a more targeted approach. For this purpose, specifying the timetable for the short-term support in a very transparent manner is critical.

In general, the eligibility criteria for inclusion in the program should be clear and easy to implement. It is important to create transparent mechanisms for choosing beneficiaries and to establish clear grievance mechanisms. If people do not understand how or why certain families were chosen to receive benefits, a perception of unfairness could follow which would damage the credibility and efficacy of the program.

In Pakistan, three criteria defined eligible households (Vishwanath and Yu 2008). Households had to fulfill one of the following conditions:

(i) have five or more children, including orphans;
(ii) be headed by a woman; or,
(iii) have one or more disabled members.

The design team also developed a comprehensive manual detailing the eligibility criteria, rules for validation and appeals, and accountability structures for various tiers of government (World Bank/GFDRR 2010).

The eligibility criteria for any program that uses household-level targeting should reflect the priority categories and include all potentially vulnerable categories of the disaster-affected population, and be simple and easily verifiable, without significant administrative burden to implement.

The second step is to identify beneficiaries.

Once criteria are established, the process for identifying beneficiary households can be either left to communities or be administered by local authorities. Since communities are fractured and scattered in the aftermath of a disaster, mobilizing effective community targeting is often difficult. In general, household-level targeting is implemented through a questionnaire that aims to identify the most vulnerable households through carefully designed eligibility criteria. Because communities were disrupted and scattered by the earthquake in Pakistan, the authorities decided to select beneficiaries through a well-defined targeting process. A simple targeting form was administered to collect information from all households in the affected areas. As information was collected, it was reviewed against the eligibility conditions, and households were selected for the program. A clear grievance process was implemented to ensure that those households who felt wrongly excluded could appeal, and local government officials had the responsibility to investigate and resolve the appeals.

Household-level targeting can also be accomplished through community participation methods by soliciting the input of village members and asking them to apply clear eligibility criteria. Community targeting is generally done through group meetings and can be difficult to execute fairly in the chaos after a disaster when households are scattered or may see themselves as competing for resources.

For geographic targeting, administrators identify the most affected areas and include every household in those areas. In

In Sri Lanka, there was a well-established national safety net program that was used to target beneficiaries in the aftermath of the tsunami. Community officers who worked in that program were entrusted to identify eligible households based on broad eligibility criteria. To prevent exclusion of affected households, a monitoring survey was implemented early in the program to make targeting corrections (World Bank/GFDRR 2010).

In contrast, in Pakistan, there was no history of a national cash grants program, so the government preferred to use simple eligibility criteria to identify beneficiaries. The criteria were applied through an application process that was managed by respected community members such as elders and teachers, who were trained to conduct an open information collection process.

particular, geographic targeting may be more appropriate "in areas where the damage is extensive and most households are affected" (Vishwanath and Yu 2008). Since people often move to be with family or to areas where they can find work, it is difficult to isolate affected families through geography alone.

Using existing safety net programs is generally the first choice among practitioners because of the ease and clarity such programs provide in targeting. Existing safety net and welfare programs have already carefully targeted beneficiaries, thus facilitating the work of post-disaster targeting. These existing programs also tend to have poverty-related information on all of the households they serve, making tracking and identification easier. In using such programs to target cash transfers, one must be careful to include people who may be newly vulnerable as a result of the disaster who may not be members of previously existing social welfare programs.

The wages should be high enough to support the household but low enough to attract only the truly needy.

Transfer Amount and Duration

Program administrators must decide the level of treatment, i.e., how much cash to transfer or what kind of asset to deliver. Generally, cash transfers provide enough money to meet the basic needs of the household on a monthly basis for a short period of time. "Transfer amounts per household should take into account what is needed on average to cover basic necessities. A reference point for estimating such needs is the officially established poverty line" (Vishwanath and Yu 2008). Additional guidelines such as the national food basket can be useful in setting this amount. The level of treatment must balance households' needs with resource availability and labor disincentives (World Bank/GFDRR 2010). In all cases, the duration of the transfer should be specified from the outset (Vishwanath and Yu 2008).

In the case of cash for work programs, the wage rate should provide for beneficiaries' needs without crowding out unsubsidized work opportunities. The wages should be high enough to support the household but low enough to attract only the truly needy. Those with market-based employment opportunities should not be incentivized to join this program. Often, the resulting wage will be less than the legal minimum wage. There is an obvious arithmetic trade-off here between generosity and coverage.

Argentina and India's public works programs, although not initiated as disaster response programs, provide two useful examples in this regard. In Argentina, the wage rate was set to be below the minimum wage in 2000. This policy change further expanded the program which already covered 400,000 people in 16,000 projects. In contrast, in the employment guarantee scheme in the India state of Maharashtra, the wage level of the scheme increased substantially when the minimum wage rate was doubled in 1988, leading to a significant drop in the number of person-days of employment generated.

Delivery Mechanisms and Implementation Arrangements

Finding an efficient and traceable way to deliver the money is one of the key challenges in a cash transfer program. The method must balance a desire to distribute money quickly and efficiently with a need for accountability and governance mechanisms. Furthermore, beneficiaries need to be able to access their transfers without high transaction costs from travel or delays (World Bank/GFDRR 2010). Since corruption may be a concern in a post-disaster environment, programs must also include careful measures to ensure the money reaches the intended beneficiary. Similarly, the program must include measures to ensure that families do not "double dip" or game the system in unfair ways.

Broad social welfare programs are often the quickest way to set up mechanisms to deliver resources. Such programs generally have program officers, identification cards, and other systems in place for regularly identifying these households. Without such programs in place, governments have used armored trucks to deliver money or have deposited money directly into bank accounts for beneficiaries to access. Banks, credit unions, post offices, remittance offices and other community institutions can be good distribution sites if they are still standing and are accessible. Identification cards can also be a good delivery method but they must "be provided to those who have either lost or never had one" (Vishwanath and Yu 2008). In all cases, the distribution method should be transparent and auditable (World Bank/GFDRR 2010).

The Pakistani government opted to make benefit payments through banks and arranged for beneficiaries to open bank accounts for free. However, the accessibility of banks was problematic in remote areas and caused payment delays. In addition, some households (e.g. those headed by older women and widows) found the bank hard to reach (Vishwanath and Yu 2008).

How many person-days of employment per household should a public works program provide on a regular basis? This parameter determines how much stabilization impact the program can offer. Having a regular program in place can be of great benefit in times of disaster, as the program can be easily scaled up as needed.

An important determinant of the cost-effectiveness of a public works program is how big a share the wage bill constitutes of the total program cost. Many factors determine the share, particularly the nature of the asset created. Program planners may have to forcefully support, against engineers who may tend to favor high-standard infrastructure (e.g., paved roads) and mechanized methods of construction, serviceable lower standards and labor-contracting as the default method of construction.

It is estimated that for most rural road construction projects, the cost of labor in poorer countries should range from 40 to 50 percent of the total costs. In road or drainage maintenance projects, the ratio ranges between 70 and 80 percent. In Argentina, the share of labor costs ranged from 30 to 70 percent for the public works program depending on the type of project. In South Korea, the share of labor costs was close to 70 percent.

In Honduras, the Honduras Social Investment Fund (FHIS) played a pivotal role in responding to requests from both the local and central levels to help rebuild the country's critical local infrastructure after Hurricane Mitch in 1998. With the operational flexibility afforded by its legal framework and relatively lean structure, the FHIS was able to respond to the crisis immediately. It established 11 regional offices. Its technical experts were in disaster areas within hours of receiving the hurricane's damage assessment. They estimated the need to clean up mud and debris, and repair or replace water and sanitation systems, access roads, bridges, health centers, and schools.

Recognizing the need for quick action, the FHIS greatly simplified its standard subproject requirements while maintaining certain safeguard requirements to ensure accountability. Within 100 days, FHIS approved 2,100 projects with a total value of US$40 million.

Within a year, about 3,400 emergency subprojects were financed. FHIS's immediate focus on restoring economic activities and basic social services prevented the emergency from aggravating poverty. Labor accounted for about 70 percent of clean-up activities and 25 to 30 percent of the value of most subprojects. FHIS created about 100,000 person-months of employment during the first 3 months after Hurricane Mitch.

Although labor-intensive public works programs have the potential to create short-term employment and income support for poor households, one should bear in mind several important implementation issues:

- How projects are selected;
- How much self-selection is practiced by participants;
- How the funds flow; and
- How well the program is monitored.

Some of the large national or sub-national programs tend to be supply-driven, implemented by local bodies but subject to pre-determined centrally devised guidelines. Some programs, especially the relatively small projects managed under the umbrella of social investment funds or community-driven development (SIF/CDD) programs, are demand-driven in nature. Communities submit ideas for potential projects to the SIFs, which then screen these ideas for viability after a quick cost-benefit analysis. Local authorities and program managers apply directly to higher-level administration for funding, and allocations are made based on the size of the subprojects and other indicators considered important for achieving the project objectives. Local communities implement the approved projects, often hiring private contractors to administer the work.

Exit Strategy

Finally, one must define an end point to the program as resources are not infinite. Moreover, ensuring a clear exit strategy will go a long way in helping people avoid aid dependency. If beneficiaries know the program will end,

they will not be deterred from seeking permanent employment elsewhere (World Bank/GFDRR 2010).

To avoid dependency, a clear and transparent exit strategy needs to be defined prior to the initiation of the program. When phasing out the transfer of cash or assets, the government can consider adopting different approaches to different population groups. For the able-bodied, the program can move first from unconditional to conditional transfers. Conditions can be based on work (e.g., participation in a public works program) or actions that would prepare the beneficiaries for employment opportunities to reintegrate them into the normal work environment. For the most vulnerable households without working capacity (e.g., households headed by elderly people, with disabled members or orphans), the cash transfer can be delivered through the regular social welfare programs, and if necessary, at an enhanced level for a period of time. The presence of pre-existing safety net programs can be a huge advantage in phasing out post-disaster livelihood support. The institutional knowledge and capacity is readily available, and these existing instruments lend themselves to expansions to include households or individuals who need assistance over a prolonged period.

Politicians are often wary of initiating cash transfer programs because welfare payment programs can be extremely difficult to dismantle.

In the case of cash for work programs, it seems sensible to build on pre-existing public works programs to ensure that basic program administrative structure is well in place and that key operational guidelines are developed and followed. This would also allow for quick implementation of public works programs to support the next stage of reconstruction. To fully realize the potential of public works as a short-term income support program, one needs to design the key policy parameters accordingly. In the meantime, it is important to recognize that a public works program is not a long-term employment program and cannot be expected to serve as the vehicle for long-term human capital investment.

Finally, clear exit strategies are also useful politically. Politicians are often wary of initiating cash transfer programs because welfare payment programs can be extremely difficult to dismantle. Building in a clear exit strategy from the outset and creating a plan for how to wean people off the program is an essential aspect of good program design and can motivate political buy-in.

5. IMPORTANCE OF DATA

In all cases where there are good information, identification, and communication systems set up beforehand, the targeting and monitoring of livelihood programs can be executed more successfully. The availability of timely, accurate, and relevant data is critical to improving design, identifying need, improving targeting, and monitoring progress. For the purposes of this paper, our goal is also to motivate governments and other agencies to make data collection a priority during normal times and before disasters such that it is available in the event of a disaster.

Annual surveys and other large-scale information collection mechanisms provide excellent pre-disaster data against which to measure the impact of a disaster and to design programs. With such resources in hand, researchers can also conduct longitudinal studies on the effects of the disaster and the relief programs that came after a disaster. After studying a number of information management systems for disaster relief, Amin and Goldstein (2008) concluded that "the most important lesson that emerges (…) is that investments in disaster information management systems are far more likely to be effective if they are accomplished in advance".

In designing a data collection system for use at the time of a disaster, Amin and Goldstein offer a few pieces of advice:

- Make it easy for varying organizations to participate and contribute their information.
- Create positive incentives for participation through the use of carrots and sticks.
- Think carefully about appropriate geographical units, e.g. villages, districts.
- House the data in the appropriate agency.
- Choose technology carefully.
- Ensure that outputs meet the needs of users.
- Ensure that users receive benefits early on.
- Store the information in standardized formats that can be used in the future.

Design: Without data, program officers have little sense of what circumstances were like before or how people were earning income before the disaster, making it difficult to design an appropriate program. For example, in areas where people are accustomed to migrate during the harvest season, it would not be appropriate to initiate a cash for work program. Instead, a cash grant accompanied by some food might provide wage earners sufficient nutrition and money for transportation for them to reenter the workforce.

Estimating Need: Data can also help estimate how many people will be in need after a disaster. For example, a national living standards survey can tell you how many people lived below the poverty line, as well as how many people were clustered around the poverty line and may be vulnerable to shocks. Such information can help you distinguish between the "structurally poor" and the "shocked" who are in danger of becoming structurally poor without urgent support. Each of these groups will likely need different services after a disaster and having the information to identify them can significantly aid in targeting and treatment decisions.

Broad social welfare and social protection programs can be helpful in establishing information baselines. These programs have already gone through a selection and monitoring process, and have data about the households in their program. This sort of information can be an extremely rich baseline from which to assess how households were affected by the disaster. These records can also help counter corruption by providing a baseline for how many vulnerable people may live in an area, creating a counterweight to overcounting by officials looking to increase financial flows to their areas (Amin and Goldstein 2008).

Lessons from RISEPAK[1]

In Pakistan, RISEPAK (Relief Information System for Earthquakes – Pakistan) was an attempt to coordinate information between national and international organizations in the aftermath of the 2005 earthquake by putting information about affected populations online. It was created in only ten days after the earthquake through a collaborative effort between the World Bank/Government of Pakistan coordinating team for relief work and Pakistan's largest Internet provider, World Online (WOL). RISEPAK offered pre-earthquake information showing village-level demographic and infrastructure data, major road networks, and the distance of every village from the epicenter of the earthquake. Most importantly, it could track damage, information on injuries, what medical supplies were needed, what had been supplied, and what was still needed in each village. The system had three main components: a database of information from censuses taken before the earthquake, a network of relief actors who provided realtime updates from the field, and a public notice board where people could post complaints, comments, and suggestions. In recognition of its innovative nature, RISEPAK was awarded the Stockholm Challenge Award in the category of Public Administration in 2006.

RISEPAK was able to encourage many organizations to share their information on the portal. However, they were also faced with a number of challenges. To start, few maps or censuses had been developed by the government, especially for Kashmir. "Different villages often [had] the same name and the name of an individual village [varied] across documents." Finally, the difficult terrain meant that limited infrastructure had been created. In fact, cell phone service had not yet been extended to the region. In the face of these challenges, the founders were particularly concerned that a lack of information might mean that many villages would be "left behind" or excluded from relief programs.

In the two months that followed the earthquake, RISEPAK went from having data about 200 villages to having data about 950 villages. Furthermore, RISEPAK was able to develop a system of unique village identification codes

Lessons from RISEPAK[1] (continued)

and, using satellite imagery, produced maps indicating where villages were actually groups of smaller settlements, ensuring that remote settlements were not excluded. Amin reports that today even organizations that are not aware of RISEPAK have RISEPAK maps on their walls.

However, a big challenge was how to make systems like RISEPAK sustainable and create incentives toward their sustainability. RISEPAK depended on the work of volunteers to solicit and encourage organizations to provide information. In the absence of volunteerism and incentives for organizations to participate, "the system database quickly became outdated."

The success of RISEPAK points to new directions for information management after disasters. The online, open-access format of RISEPAK suggests that bottom-up methods for gathering information can be reliable and comprehensive. The system was able to coordinate highly disparate actors from government agencies to local NGOs to multilateral agencies. Secondly, the system points to the power of an effectively harnessed volunteer base. Finally, the waning of the system shows that information systems should have low costs for organizations, while still yielding fairly quick benefits for its users. Donors should seriously consider unifying reporting requirements for relief organizations such that information can be uniformly and centrally reported.

[1]This box draws on Chapter 7 of Amin and Goldstein (2008) by Samia Amin entitled "Data Management Systems after the Earthquake in Pakistan: The Lessons of Risepak".

It is also important for governments and relief agencies to collect data as they begin to implement relief programs.

Targeting: Collecting data at the time of implementation can also help with targeting. For example, in Pakistan, where limited data was available to identify vulnerable families, program staff started by surveying the affected population. Using the data provided by the first 140,000 applications, they

constructed indicators to identify the bottom third of households or those most vulnerable. They were able to refine those indicators as the survey continued and as the program rolled out. A key challenge for practitioners is to collect data in a meaningful and accurate manner, without sacrificing cost or timeliness (Amin and Goldstein 2008).

Evaluating Impact: As governments distribute resources, they should record the key characteristics of each of the households that are receiving assistance and similar data on households that do not. Only with this baseline data do we have any hope of coherently evaluating the impact of relief programs. Collecting adequate data at the time the program is implemented can also help us understand how the program affected different types of households. For example, we may find that the program in question helped households with fewer children or households less dependent on agriculture more than others. Such findings can guide the design of future programs and exit strategies for beneficiaries.

Careful data collection before, during, and after the tsunami in Sri Lanka allowed the government to continually refine the targeting of livelihood grants. The initial round of payments was made based on very inclusive criteria such as the presence of housing damage, or loss of any asset. An assessment done shortly after the first payment found that 25% of beneficiaries were unaffected by the tsunami. Such inclusive criteria also meant that only 6% of affected households were excluded.

This and additional assessments allowed the government to re-target the remaining payments. Whereas 81% of people in affected areas received the first payment, only 76% received the second and 63% received the third. Subsequent assessment showed that payments were discontinued among the least-affected, thus pointing to improvements in targeting through the use of data.

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PROVIDING SUSTAINABLE HEALTH

AND EDUCATION SERVICES IN DISASTER RECOVERY PROGRAMS

by Mian Shaukat Shafi

1. BACKGROUND

The earthquake and tsunami which ravaged Japan in March 2011 show that the world continues to face the debilitating consequences of both natural and man-made disasters. Schools and health facilities form the social infrastructure which is part of the critical infrastructure of any country. Critical infrastructure is broadly defined to include the systems, facilities, and networks which support the safety and economic well-being of the population before, during, and after natural disasters.[1] In many cases, disasters destroy critical infrastructure. Research shows that quick revival of safe social infrastructure such as schools and hospitals can fast-track return to normalcy, facilitate restoration of economic and livelihoods activities, and increase the resilience to cope with future disasters.

Efficient and effective reconstruction and rehabilitation of education and health facilities can be achieved through coordinated strategy that ensures clear policy and planning parameters; implementation arrangements that build local ownership and capacities with strong oversight and accountability; technology and procurement options that are quick, safe, transparently delivered, and adapted to local capacities, material, and knowledge; and operations and systems to provide sustained quality services. The overall process of reconstruction has three distinct yet overlapping phases:[2]

[1] United Nations (2006).
[2] World Bank (2008).

- Phase I is characterized by the relief effort and is typically led by the national government (in some instances by military), together with UN agencies. During this phase, which usually lasts at least several weeks, planning for reconstruction begins.
- Phase II, the early recovery phase, presents the transition from an emergency to a full-scale reconstruction program. Early reconstruction starts while emergency relief activities still continue. This is a critical phase for the success of the whole reconstruction program. In many reconstruction programs, the transition between emergency relief and reconstruction is poorly managed. This can create an unnecessary gap before reconstruction activities start and corresponding frustration amongst the affected communities. For example, frustration in post-tsunami Aceh started to build up six months after the natural disaster when core relief activities were being phased out before most reconstruction activities had begun.
- Phase III represents the fully fledged reconstruction program in which each component has its own sequence. For instance, in India, the focus of the first reconstruction year after the tsunami of 2004 was on re-establishing livelihoods, particularly of affected fishing communities. By contrast, in Aceh and Nias, the first year was dominated by housing reconstruction, followed by a focus on infrastructure (see BRR Aceh-Nias and International Partners, 2005). The focus of this background paper is on Phase III, including any overlaps that it may have with other phases.

2. OBJECTIVES AND SCOPE

This paper aims to summarize the discussion in the literature on post-disaster recovery and reconstruction of social infrastructure, specifically schools and health facilities. This paper reflects on the lessons learned from the last two decades of post-disaster implementation in both the developing and developed countries, and highlights some of the best practices found there.

The performance of post-disaster recovery experience has been gauged using case studies focused on three key dimensions of reconstruction: (1) planning; (2) implementation; and (3) sustainable service delivery.

3. METHODOLOGY

For this paper, a desk-based diagnostic review of various publications from different donor and government agencies was undertaken dealing specifically with lessons learned from reconstruction programs. Detailed information on housing and education (H&E) infrastructure activities has also been obtained from the Pakistan Earthquake Reconstruction and Rehabilitation Authority (ERRA) website dealing explicitly with its schools and health facilities. Relevant information related to disaster recovery and reconstruction was accessed from the Global Facility for Disaster Reduction and Recovery website, which forms a large part of the analysis.

4. PROVIDING SUSTAINABLE HEALTH AND EDUCATION SERVICES IN DISASTER RECOVERY PROGRAMS

The reconstruction phase typically involves a trajectory of returning to "normality" and includes the implementation of capital projects (housing, schools, clinics), as well as re-establishing basic public services in a sustainable manner while "replacing/rebuilding human resource base" – in the case of Aceh and Pakistan earthquake, many teachers and health staff perished.

Although there are standard definitions and scope used in the literature for project or reconstruction cycles,[3] for the purpose of post-disaster reconstruction, this paper uses the following broad categories: (i) **planning:** including assessment, policy, strategy, coordination, and planning; (ii) **implementation:** including organizational arrangements, identification of projects, design, procurement and award, construction supervision, grievance redress, and monitoring and evaluation; and (iii) **operations:** including staffing, capacity, financial sustainability, and preparedness.

Experiences, lessons learned, and open questions that need further deliberation related to specific aspects of these three topics are discussed below:

[3] World Bank (2010a). See specifically Chapter 18, "Monitoring and Information Management," and Chapter 19, "Mitigating the Risk of Corruption."

4.1 Planning

Assessment: One of the basic planning tools after disasters is the Post-Disaster Needs Assessment (PDNA). Experience suggests PDNA estimates are typically revised at various stages. Following the 2004 tsunami and earthquakes, the level of physical damage and losses was overestimated in Aceh Province, while for the Pakistan earthquake in 2005 they were underestimated.[4] Both situations required adjusting their plans to a different emerging reality. According to IEG (2006, Box 4.7), looking at the earliest phase of action, successful damage assessments are quick, detailed, and focused, but are not one-off efforts. They are updated as the situation unfolds and are not abandoned after the initial effort.

PDNAs have been generally effective in informing overarching policy and sector strategies in health and education, but much less effective in detailed sector planning for reconstruction, unless they are periodically updated or supported by continuing assessments. In the case of the Pakistan earthquake of 2005, no primary assessment of the education and health damages and existing capacities was undertaken, which resulted in poor planning and delays in reconstruction, compared to housing, where a comprehensive primary assessment was undertaken at the start. It is understandable that it is not always possible to initiate primary assessment or updating the needs assessment before policy formulation. However, experience shows that where primary assessment is undertaken with existing capacities and their limitations in mind, a much more effective reconstruction policy is formulated that integrates sustainability of the services in health and education at the outset.

Reconstruction policy (among other things) in the context of health and education needs to address reconstruction parameters including standards for safety (e.g., the goal to build back better), right sizing (building to pre-disaster, state, national, or international standards), right siting (relocation, land use, and master planning), rationalization (prioritizing), roles (key agency responsible), sustainability (resources for operations), and equity. Review of policy

[4] World Bank (2009).

parameters in most disasters show many of these aspects are absent or inadequately addressed at the policy level and in some cases policies were not implemented or monitored. In the case of the Pakistan earthquake of 2005, this has resulted in major delays, use of differential standards and sizing of facilities, and lack of resources and staff for running completed facilities. Similarly, in Banda Aceh, disparities in use and availability of funds for schools and health facilities were seen due to gaps in policy. It is also observed in certain cases that policy preferences of donors also lead to an "over-capacity" when donor policies/interests are not always aligned with Government policies, resulting in gaps – this was certainly the case of Aceh/Nias. In some cases, donors insist on providing certain facilities which may not be required or appropriate. Also, some of the NGO programs funded by private donations may be restricted to certain subsectors, allowing little flexibility for realignment.

The policy should take into account the context. According to IEG, there is evidence that some flood response programs have focused too heavily on rebuilding infrastructure and not enough on better adaptation and preparedness. For example, in Bangladesh, there was a gradual shift in thinking about floods and flood management by government, donors, and NGOs starting in the late 1980s. Disasters increasingly came to be seen as part of the development continuum, to be expected and prepared for. Greater attention was placed on mitigation, preparedness, coping strategies for the poor, flood-proofing rather than flood control, and socio-economic and political factors (WHO 2000, Beck 2005).

Equitable allocation of resources often is not easy. On the one hand, geographic and sector disparities of affected areas have to be addressed, and on the other, there is the disparity of adjoining areas that are not directly affected by disaster but have equally compelling needs in education and health irrespective of the disaster. The two key parameters used for equitable allocation of resources among provinces/regions or sectors are the damages sustained and the associated disaster risks. However, how these are translated into equitable allocation of resources are policy decisions with political and resource implications – with large variations in application between countries.

The "Safe Hospital" concept was introduced following the Mexican earthquake in 1985, which has become standard practice and part of the Hyogo Agenda. This concept refers to facilities where services remain accessible, functioning at maximum capacity, and in the same infrastructure during and immediately following the impact of an adverse natural event. However, these best practices, which do not entail major additional costs, were not integrated in post-earthquake reconstruction plans in Pakistan and hence were not built into the remaining phases of reconstruction and operation of hospital facilities there.

The key challenge is that social sector services in most countries are decentralized, yet the post-disaster situation requires some overarching policy parameters to ensure safety and optimal and equitable use of resources provided by the donors and central governments. This demands active consultation and agreement with key stakeholders and provincial/state governments on policy parameters.

Comprehensive strategy lays the foundation for planning: To translate these policies into action requires sector strategies for reconstruction. These strategies, among other things, should define the scope of activities; the identification, selection, and prioritization criteria of subprojects; the approval and oversight mechanisms; the technological options for reconstruction; the approach for procurement of services for design and supervision, role of agencies and communities in oversight, approvals, coordination, planning, implementation, and operations; additional staffing requirements; and risk mitigation related to disaster, environmental and social safeguards, fiduciary and anticorruption aspects, and monitoring and evaluation.

The Government of Pakistan considered the 2005 earthquake as an opportunity to raise the bar and wanted a complete revamping of the health care system, but following appraisal and assessments, a rationalized healthcare system was agreed upon in the reconstruction strategy which created efficiency gains on the basis of past performance and still made healthcare more responsive to population needs. Some of these changes included:

- Strategic integration of smaller units in larger facilities including mergers of health and population facilities;

- Health facilities closed or relocated, if not justified according to national/state criteria; and
- Upgrading of some facilities based on population size and post-disaster requirement, if it was undersized pre-disaster.

One of the major challenges during identification is to agree on the scope of the services to be provided in the new health and education facilities, especially in developing countries where facilities are undersized in most cases even before the disaster. If this is not clearly defined, the sector strategy (as was the case in Pakistan) can cause major delays in the identification and design stage.

One of the major challenges during identification is to agree on the scope of the services to be provided in the new health and education facilities, especially in developing countries where facilities are undersized in most cases even before the disaster.

Effective coordination has offered a considerable challenge after recent earthquakes with a large number of organizations and multiple levels of government involved. For example, there were 300 NGOs working after the Gujarat earthquake of 2001, and 120 in Bam in 2003.[5] The main lesson from the 1998 Afghanistan earthquake was the need for greater cross-agency disaster preparedness at the field and regional levels, a key part of which was greater coordination. In Turkey (1999), Gujarat (2001), and Bam (2003), national authorities were initially overwhelmed by the scene of the disaster, the pressure to respond, and the influx of the international agencies.

Registration of CSOs and NGOs helps ensure that government is aware of their presence and allows government to monitor their activities, although registration rules should not be so strict as to discourage needed interventions. One good reason for registration requirements is to require participation in coordination and reporting mechanisms by these organizations, to maximize their contribution.

As education and health sectors are considered attractive for donor funding, there are invariably a large number of partners and donors involved in reconstruction in those sectors. This overload has been offset by single multi-donor trust funds coordinated by a few donors after the Tsunami of 2004. In the case of Pakistan, to offset the coordination overload, depending upon comparative advantage, the coordination role was transferred to lead agencies (in some case donors) in the health and education sectors.

[5] ALNAP (2005).

The widespread destruction of schools and vast numbers of children and youth affected, combined with a weak, non-state education system prior to the disaster, put extreme pressure to respond in a coordinated manner in Pakistan in 2005, Indonesia in 2004, and Haiti in 2010. Establishment of clusters at the operational level at the state or district level, where existing social facilities are weak, has shown promise for a well coordinated effort.

Information and communications have proven to be an important aspect of coordination both for governments and donors. For example, there is evidence in the Mozambique flood case that donor coordination could have been improved if donors had been more open in sharing and communicating information including damage assessments and macroeconomic evaluations (IEG, n.d.).

Realistic planning and definitive timelines for monitoring and accountability: Depending on the severity of the disaster, social infrastructure reconstruction is likely to take much longer than the reconstruction of housing, so interim solutions and full reconstruction must both be planned. The time period for reconstruction in the planning process has been underestimated in most disasters. Across some 60 disaster activities reviewed in IEG (2006), most required extensions of about a year and a half on 3-6-year projects, and even then not all the extended projects achieved their original targets. While there is general consensus that lifeline services need to be established first in the recovery phase, planning for reconstruction (based on primary assessment and safe reconstruction) of education and health facilities takes much longer – this is not fully appreciated by most governments and international financial institutions (IFIs) which normally have much shorter time-spans provided in their reconstruction funding window, ranging between 24 and 36 months. This tempts the local governments to shortchange infrastructure planning and design to take advantage of the availability of reconstruction funds. The actual time taken to reconstruct after most disasters, including the Indian Tsunami and the Pakistan Earthquake, demands reconsideration of the recovery period to make the planning process more realistic, comprehensive, and responsive to the disaster.

It should be noted that both in Pakistan and in Indonesia, a comprehensive monitoring and evaluation (M&E) system along with a financial management information system (FMIS) to track progress of the multiple delivery mechanisms and financials, that was acceptable to donors, took a long time to develop and set up. New ways need to be found that can fast-track the establishment and operationalization of harmonized and effective M&E and FMISs.

Coordinated planning in health and education: One of the lessons learned from the 1998 Afghanistan earthquakes was that there is a need to manage the transition from the relief to the recovery phase from the start of the intervention (IFRC, 2000). The World Bank (2005) also notes an early role for planning the transition from relief to recovery.

It has been noted (Pakistan Earthquake) that plans for early recovery (Phase II) and reconstruction (Phase III) were not well coordinated and normally different agencies are involved in these phases. It is crucial to coordinate the plans for early recovery (Phase II) with reconstruction (Phase III), as in many cases support for temporary services (normally financed through early recovery funds) were withdrawn before the reconstruction was complete, which created a serious gap in services and discontent amongst the affected communities. Coordinated planning between the two phases can also offset costs as some of the equipment and materials procured for Phase II can be used in the reconstructed facilities in Phase III.

Integrating the reconstruction and development plans: The health and education sectors have endemic development challenges in the developing countries, like quality of staff, curriculum, evaluation, monitoring, and management, that existed before the disaster. Post-disaster reconstruction provides the opportunity to improve upon some of these issues – however, it is important to identify the relevant support areas needed for the post-disaster reconstruction phase and not get embroiled in the overall development agenda of these sectors indefinitely. One of the key features of reconstruction policy, strategy, and plans is alignment with the country's and the locality's overall development strategy, particularly with respect to long-term development

and land use plans, the allocation of institutional roles, and the standards for infrastructure improvement,[6] so that support for endemic challenges gets embedded where it belongs. Similarly, pre-disaster strategies and plans may also need adjustment to align them to post-disaster realities.

4.2 Implementation Arrangements and Delivery of Infrastructure

Choosing the most suitable implementation and delivery arrangement is a key factor in determining the success of a program. The project implementation arrangement entails: (i) organizational arrangements, (ii) identification, (iii) design, (iv) procurement, (v) construction supervision, (vi) grievance redress, and (vii) monitoring and evaluation. This section examines how some of the above parameters have been dealt with in reconstruction efforts worldwide.

i. Organizational Arrangements: Diverse organizational arrangements were used in different disasters. In the cases of Yogyakarta and Central Java and San Francisco, earthquakes have been handled through regular government organizations and line ministries at central and local level.

In other instances, such as Pakistan (2005 earthquake) and Indonesia (2004 tsunami), dedicated agencies for policy, coordination, oversight, monitoring, and fund management were set up at the central level to manage reconstruction. The physical implementation depending upon existing capacities was undertaken by state or local governments, third parties (off-budget NGOs and management contractors), and local communities - in some cases physical implementation was also undertaken centrally, either due to complexity or to augment the implementation capacity in the short term. There have been variations in organizational structures for post-disaster reconstruction in different countries depending upon the context, level of complexity, capacity of the implementing partners and agencies, and other considerations related to sustainability, ownership, and operations of the facilities that are to be reconstructed.

[5] World Bank (2009).

Clarity of Roles: New organizational structures create turf issues and confusion about roles of existing ones. Invariably, at the central level, a single point of contact (new or existing) responsible for coordination, oversight, and overall policy has been a common feature of organizational arrangements in most post-disaster reconstruction - representing a good practice. Although new organizations may be necessary in some cases, beyond that flexibility is important in the organizational arrangement – in all cases clarity of roles, respecting mandates of existing organizations, and enhancing accountability is essential for efficient and transparent delivery of the reconstruction portfolio. This is a credibility issue if resources have to be mobilized. Major delays have been witnessed in post-flood donor commitment in Pakistan (2010) due to delays in organizational setup and lack of accountability system clarity. However, in the case of Indonesia, the government realized immediately that it had to create a new – but streamlined – agency because of persistent governance issues. The donor community saw this as a very positive step conducive to channeling donor funds for the reconstruction.

Enhanced Accountability: Enhanced fiduciary safeguards and risk mitigation measures, including internal controls and external audits, third-party (including beneficiary and other public) monitoring, and independent oversight and disclosure are some key accountability measures adopted successfully in post-disaster reconstruction. The issue with the social sector portfolio is its spread and in most cases its multiplicity of partners that are implementing the portfolio, making consistent application of quality and standards and their monitoring a challenge.

Institutionalizing Fast-Tracking: In most disasters, including the Tsunami in 2004 (World Bank, 2010b and staff discussion) and Pakistan's earthquake in 2005, emergency procedures and systems were instituted in response to the disaster to fast-track the approval, review, procurement, and delivery of subprojects. Although these procedures are necessary for expediency with additional checks and balances, experience suggests that in most cases, these have not been institutionalized, are usually re-invented, and staff have to be trained in their use every time there is a disaster. Given the frequency of disasters, there is dire need to institutionalize emergency procedures and systems, especially in government agencies that are responsible for post-disaster reconstruction.

Capacitating the Organizational Setup: One of the basic ingredients of a good organizational structure is dictated by the quality of its human resources. It has also been widely noted that in the design of projects and programs responding to disaster situations, the possibility of diminished institutional capacity should be taken into account at all levels through realism in the design of roles and tasks, and strengthening in core capacities (e.g., IEG, 2010). With weak capacity, experience suggests that elite capture can arise (IEG 2005).

For effective delivery of post-disaster reconstruction, the main challenge has been the additional human resource requirement in the short to medium term, retention and additional load on existing staff, and building their capacities where required. It took more than one year after the earthquake in Pakistan to get the additional human resources placed in the organizations responsible for health and education sector reconstruction. For efficient recovery, the focus should be on special incentives for both staff within government institutions and new staff, on outsourcing to the private sector and NGOs, and on a targeted capacity building program.

ii. Transparent Identification of Health and Education: Following a disaster, one cause of delay in implementation is the proper identification of education and health facilities to be reconstructed and the scope of reconstruction due to either weakness in the identification criteria and standards, or their application and oversight. Politics and individual and institutional preferences (including donor profiling) influence identification and standards for reconstruction of health and education facilities. Strong oversight and disclosure of criteria and standards to be applied have allowed more equitable and fair identification and consistent application of standards in many disaster situations. This is especially important when reconstruction funding is in short supply. However, to avoid conflicts, it is important that before finalizing such standards and criteria, consultations with communities and stakeholders have taken place to ensure a certain level of acceptability.

While initial quick action is important, experience suggests that in an emergency situation, such as that in Pakistan, subproject readiness should not divert the investment focus from a well- planned priority list. In other words,

if the highest-priority programs are not ready to go, it is better to not launch lower-priority activities simply because they are ready (IEG, 2006, 2010).

iii. Design Parameters: The design options are linked to the standards of safety, multi-hazard risks, safeguards and environmental risk, capacity of the key implementation agencies, and overall institutional arrangements.

Locally Adapted Designs Empower Communities and Local Institutions: Existing conventional or local construction techniques and materials have been used for post-disaster reconstruction of primary health and education facilities with some modifications to make the new construction multi-hazard-resistant (Indonesia and Pakistan). This allows use of readily available expertise and material and the possibility to deliver through local institutions, contractors, or communities themselves – allowing the much needed local employment and economic opportunities. This also inculcates more ownership and allows cost-effective maintenance later. The Community-Driven Development (CDD) approach is premised on the belief that populations have the right abilities, and are best placed, to drive their own development. The 2004 Aceh experience showed that several development agencies, NGOs, and relief organizations engaged local communities in post-disaster reconstruction of education and health facilities as it was understood to be the most effective way to gain ownership and reestablish community networks. The mechanisms adopted vary but the concepts remain the same, providing cash-for-work, materials, and capacity building to train the local population for reconstruction projects. By emphasizing empowerment and putting resources in the direct control of community groups, the CDD approach holds the promise of achieving inclusive and sustainable poverty reduction. The CDD approach was also implemented under the Asian Development Bank (ADB) reconstruction program in Indonesia. Through so-called "block grants", reconstruction of many school buildings was successfully undertaken through school committees.

Other CDD projects including the Afghanistan National Solidarity Program and the Indonesia Kecamatan Development Program have received funding from other bilateral and multilateral donors.

The challenges of this approach are the scope of the training effort required to train local communities in multi-hazard-resistant construction techniques; close oversight required for consistency in application of standards and quality control of workmanship and materials; risk coverage in case of faults in construction if communities are reconstructing; immediate availability of local labor for training and construction considering competing priorities of the affected population like housing; time taken to deliver often being longer than anticipated; and possible limitations of local technologies and materials for hospitals and multi-story school structures.

Are Disasters the Best Opportunities for Introducing New, Resilient, and Efficient Technologies? Designing and introducing new innovative technologies for reconstruction remains a difficult proposition. The parameters that govern the decision for new technologies are reduction in cost; speed of reconstruction; adaptability and local acceptability; quality control; maintenance; and higher resilience to multiple hazards.

The experience with the introduction of new technologies has been mixed. In Pakistan, pre-engineered light steel frame structures were introduced to increase efficiency of reconstruction and for effective quality control at source, as the number of schools damaged after the earthquake in 2005 was large and construction practices within the institutions responsible for construction were poor. More than 20,000 children had died in 6,000 partly or completely damaged schools. It took more than one year to develop cultural acceptability by the local population, and another year to develop understanding of the technology and procedures by the government institutions. Although the quality objectives were achieved and most of the pre-engineered elements are now locally produced, there were no efficiency gains in time for the earthquake reconstruction. The value added has been the introduction of the multi-hazard-resistant technology, adoption by the private and public sectors, and availability of an efficient option (schools can be constructed in one month) both for development and for any future disasters.

Smarter Design: The Hyogo agenda has introduced the concept of safe schools as well as safe hospitals. The safety indices taking into account multiple hazards can be used to review design of education and health facilities fairly comprehensively. However, the design practices in most countries have not fully adopted these guidelines in their standards and their application during contracting is also weak due to capacity issues and construction practices in different countries. More attention in the form of capacity development, training, and changes in country standards for reconstruction have to be made to design and construct safer and smarter schools and health facilities whose services remain accessible and functioning at maximum capacity when disaster strikes.[7] In the case of Indonesia, a prefabricated approach was successfully adopted for schools on a remote island where erection was undertaken through block grants. Without such an approach, reconstruction would have taken much more time and at a higher cost.

iv. Efficient Procurement and Delivery of Services and Work after Disasters: Emergencies require fast-track procurement procedures that may sacrifice principles of economy, efficiency, transparency, and fairness to reduce implementation time. These flexibilities exist in some countries and major donors' procedures. Procurement options are dictated by the impact of the disaster on the local supplies and capacities and the urgency of the needs for reconstruction. Invariably, demand for both capacities to deliver and materials required for delivery increases exponentially. Many forces, some real and other artificial, restrict the expansion of supply even as demand for goods, works, and services rises dramatically.

The Post-Disaster Procurement Challenge: Procurement officials in both government and non-government agencies are expected to exercise high levels of competence, discretion, and integrity, but in many cases lack adequate training and experience of procurement in emergencies, are influenced by local political forces, and have limited understanding of the supply side constraints. It has been noted that after most disasters, there are immediate price hikes and it becomes difficult to differentiate between inefficient procurement and corruption. The pervasiveness of corruption in procurement may

[7] WHO (2009, 9).

also increase as expected gains increase, transparency is reduced, and so is the riskiness of corruption. For these reasons, while ex-ante controls on procurement must give way somewhat to the urgency of recovery and reconstruction, this must be compensated by tighter ex-post inspection, auditing, and punishment of offenders.

The Best Practices in Hiring the Services of Communities for Reconstruction: One of the key advantages of community engagement, among others, is avoiding lengthy procurement procedures to quickly start the reconstruction efforts. The problem arises when the communities have limited skills, the designs are complex, and the quality of construction is key to reducing vulnerability to future disasters. This has led to delays, poor quality construction, and higher costs with more training, monitoring, and controlling of quality – for which additional capacities still need to be hired by the oversight agency, causing further delays.

Procuring Professional Services – the Challenges: Given the serious issues which emerged in Aceh in engaging communities for reconstruction, development agencies/NGOs gradually moved towards awarding contracts to local and even international contractors, to rebuild schools and hospitals either directly or through line ministries. This approach led to shifting of responsibility for all components of construction from hiring of laborers to procurement of firms, machinery, and material. It also led to speedy construction, more control over quality, and greater transparency over disbursement.

The drawbacks of outsourcing to contractors include community exclusion, especially if labor and to some extent material are brought from outside the area, and can result in lack of ownership. To overcome this problem, specific procedures have been put in place by most development agencies for community involvement in the planning, design, and monitoring of construction work and in some cases contract conditions partly enforcing hiring of local labor. However, the Pakistan experience showed that during the procurement phase, the tender process was time-consuming, evaluations were lengthy, and contract implementation was delayed due to legal issues and weak contract management capacity of line agencies and other procuring organizations.

In addition, subcontracting, poor decision making, and corruption became a widespread problem in 2005-2006. The problem was rectified with the implementing agencies preparing lists of blacklisted firms and prequalified contractors, and hiring additional capacities for contract management and procurement. Innovations in procurement like the use of turn-key contracts in Pakistan also did not deliver expected efficiency and management gains due to lack of familiarity of line agencies, consultants, and the private sector with these approaches.

One of the major dividends of using existing agencies to manage procurement and construction supervision has been major changes in construction practices both within line departments and among local contractors. As the government departments got involved with national and international contractors, it increased the local capacity to maintain completed infrastructure, increased ownership of facilities by the line departments, and enhanced capacity and empowerment to manage international procurement and construction supervision for future multi-hazard-resistant development.

Direct Implementation by Partners and Donor Agencies: Another way of outsourcing has been undertaken through direct implementation where the development agency/NGO acts as a contractor. Following the 2005 Pakistan earthquake, agencies such as World Vision, Mercy Corps, and others, started working as contractors, which was in addition to their original mandates. The agencies recruited labor and managed the construction work themselves while procuring construction materials. This approach has had some success as the communities had more trust in the humanitarian agencies than contractors. Moreover, with a quick response time, it has become the norm that after any disaster, NGOs are one of the first to respond with large budgets and the best of intentions. However, it has also been argued that the NGOs are more and more getting involved in permanent reconstruction of affected communities, which in many instances is outside their areas of expertise, resulting in less than adequate quality while foregoing their original mandate. As Barakat (2003) has argued, "The urgent need to do something within a short space of time is not conducive to good, sustainable housing reconstruction nor is the tendency of donors to set short timeframes for the disbursement of emergency funds."

Key Parameters for an Effective Procurement Plan: It is important that procurement and delivery options take into account the local realities, including reduced capacities and liquidities of the real market players; procurement capacities and limitations of existing procurement agencies (rent seeking and late payment); licensing and other restrictive requirements discouraging participation; and other market trends.

Effective Anti-Corruption Measures: The mechanisms used to address procurement corruption include strong oversight, third-party pre- or post-review of procurements, effective compliance and grievance redress, regular monitoring, and alternative dispute resolution measures for procurement issues that are efficient and supported by the judicial and legal systems.

Monitoring and Evaluation as a Tool for Checking Leakages and Confidence Building: Communities, non-governmental organizations, and the media can play an effective role in partnering with government for monitoring results (for example, the Indonesia case in IEG, 2006). It has been noted that public disclosure of progress and results and media oversight have been effective in reducing corruption and increasing the confidence level of donors and local communities in post-disaster reconstruction in Pakistan after the 2005 earthquake and in Indonesia after the Tsunami.

5. SUSTAINABLE SERVICE DELIVERY

Improved Sustainability and Service Delivery of the Reconstructed Facilities: Sustainability of constructed education and health facilities is related to the capacity of the local stakeholders to construct and maintain infrastructure built to multi-hazard-resistant standards, and the capacity and resources to operate the completed facilities to the service levels and safety standards that these are built for. Local stakeholders include the direct beneficiaries, the wider affected community, local authorities, service providers, and line agencies, government, and building experts. Throughout the project design and implementation, it is essential that local stakeholders are actively involved in all stages of the reconstruction cycle and reconstruction activities are undertaken

through them to the extent possible. This allows technology transfer, ownership, and building of local capacities to construct and maintain infrastructure built to multi-hazard-resistant standards. A sustainable and successful project goes beyond site selection, the choice of a sustainable solution, and training of local builders, to also involve issues of land tenure, finance, education for risk awareness, and future maintenance (see Box 1).

Box 1: Beyond Building

Proposing safe building or repair and strengthening practices is not sufficient to ensure take-up by communities. Integrated, community-based approaches for safer building should be promoted by:

- raising hazard awareness through education;
- community participation in developing the project, in decision-making, and in design selection;
- developing locally acceptable, affordable, and sustainable technological improvements;
- developing effective ways of communicating technical messages to target groups;
- skills development training for local builders and craftspeople;
- improvement of general living conditions;
- training architects and engineers (in both public and private sectors), building officials, and building by-law enforcement officers; and
- community-based disaster preparedness planning.

Source: Benson et al. (2007).

Most post-disaster reconstruction activities across the world generally have a good track record of using local resources (technical, financial, operational), technology transfer, developing local capacities and preparedness, and community and stakeholder involvement. The capacity development programs in Pakistan, China, Indonesia, and Sri Lanka have included academia, professional associations, line departments, and licensing bodies to

ensure that architects, engineers, and builders are involved in upgrading and correctly apply the appropriate codes and construction techniques and have the internal capacity to maintain the completed infrastructure.

Upgrading should also be embedded in the national and state standards of services that can be maintained and operated by the responsible agencies.

Under the Earthquake Relief and Rehabilitation Project in Azad Jammu and Kashmir and Mansehra, Khyber Pakhtunkhwa, Pakistan, communities were put in charge of identification, construction, and oversight of schools and health facilities projects through participation in School and Health Management Committees, which has created ownership of these community services and some of these schools are now being operated and maintained by the communities.

How to Optimize the Demand for Better Services Given Absorption Capacity, Equity, and Sustainability Considerations: The main challenge for sustainability has been and still remains the funding for maintenance and operations, and the lack of capacities to operate the completed health and education facilities in the public sector to the service levels and safety standards that these are built for. On most accounts after disaster, expectations of the local government and the communities are very high and the actual needs are less, and the capacities to sustainably run the new facilities are even less – particularly in the developing countries.

Understandably, most developing countries and local governments want to use disaster as an opportunity to raise the level of services that the destroyed and damaged facilities originally offered. It is very challenging to manage demands during implementation if the expectations are not negotiated and addressed in the policy and sector strategies at the outset. Upgrading should also be embedded in the national and state standards of services that can be maintained and operated by the responsible agencies. This may include agreement on some reforms and training to provide additional resources and capacities; this also has to be agreed upon in the sector strategy at the outset, much before the reconstruction planning and implementation starts. The reforms and training also require government commitment, resources, and active monitoring through the reconstruction process.

Currently, some of the expensive new health structures, with state-of-the-art equipment and facilities, meant for use by local residents in the earthquake areas of Pakistan and Indonesia, are being underutilized, due to lack of trained staff and resources required to pay them and operate the facility at the service levels they were designed for. These facilities were built by donors without regard for actual needs, national standards, or operational capacities of the state. Thus, the demand for better services remains unheeded and resources are wasted without any results to show for them. On the other hand, education facilities in most cases are operational and sustainable, mainly due to the collective support of donors for training of teachers and school management committees, strict application of the selection criteria that took into account existing capacities of facilities to be reconstructed, and strong commitment of the local government towards education with allocation of resources.

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STRENGTHENING LOCAL RECOVERY -

THE KEY TO BUILDING BACK BETTER

BACKGROUND

Communities that are directly or indirectly impacted by a disaster do not always have full involvement in decisions that are made about their futures. Planning for land, relocation, infrastructure reconstruction, and livelihood recovery requires a robust consultation process. In reality, this is frequently not the case. Examples exist where houses were built which people do not live in, people relocated to areas that are potentially more vulnerable and cannot support the livelihoods they would normally pursue, infrastructure was rebuilt for political and public profile purposes that do not meet the real needs of affected populations, etc.

While cities, towns, and villages should represent the needs of affected communities, the recent experience of the Great East Japan Earthquake tells us that the devastating impact of a disaster may exceed the capacities of local governments even in the most disaster-resilient societies in the world. The challenge that Japan now faces is how to ensure sustainable recovery processes where the national and international relief activities will be gradually replaced by locally owned recovery efforts with the full engagement of the affected population.

The 2004 Indian Ocean Tsunami marked a turning point in post-disaster reconstruction with civil society gaining a more prominent role. Private funding, through international as well as local organizations, propelled new actors to more actively engage in recovery processes and projects. In many communities, the majority of post-Tsunami funding was delivered through non-governmental organizations (NGOs), presenting new challenges and opportunities.

Positively, this enabled greater community-focused and -driven solutions and reduced the overall fiscal burden of the affected countries. However, challenges have arisen due to:

- Lack of strategic planning and coordination by receiving as well as implementing partners. Many civil society actors have remained unclear as to their mandate and therefore roles and scope of engagement in reconstruction.
- Operating and monitoring frameworks which were not built on the strengths and niches of various partners. Therefore, suboptimal results were achieved, with some delay.
- Challenges to maintain the quality standards promised in the "build-back-better" concept, with structures that could monitor, evaluate, and rectify work not meeting those standards.
- Inconsistencies in approach and policy among donors and agencies, with different communities receiving different amounts of financial and other forms of support.

With the higher profile and expanding roles of local governments, civil society, and the private sector in recovery, there is a need for internal-level change in civil society organizations to support strategic engagement. At the same time, national and international organizations need to create an open and enabling environment – political mechanisms to provide a cohesive system early in the process in support of existing national procedures and processes (including community engagement). Organizations involved in post-disaster scenarios are faced with multiple levels of governance, policy, financing, and practical implementation decisions that require significant coordination, participation, and effective resource allocation.

Experience has shown that proper coordination and a common framework to achieve the recovery will help build sustainability, cost-efficiency, and resilience in the reconstruction and recovery process, but without this there is a risk of overlap of responsibilities, sub-standard quality, and a lack of ownership of local authorities and beneficiaries.

PURPOSE

Communities, local governments, civil society organizations, and the local private sector play a critical role in providing "customer-focused solutions" during the post-disaster recovery period. In order for these local-level solutions to be sustainable, of a high-quality standard, and adaptive to future shocks and vulnerabilities, it is vital that they are supported by the policies, practices, and resources of macro-level interventions by national governments, international financial institutions, and international organizations. This roundtable will address some of the complex issues surrounding the coordination, planning, and quality implementation of post-disaster reconstruction and recovery interventions at the local level. Discussions will focus on how to establish a common recovery and reconstruction strategy, framework, and financing at higher levels (global, regional, and national) to support local action.

SCOPE AND FOCUS OF DISCUSSION THEMES

- How can systematic and inclusive strategic planning be undertaken at the national and local levels to ensure strong coordination, effective collaboration, and ownership of a range of actors in reconstruction and recovery?
- How to secure the smooth transition from nationally or internationally-led relief efforts to the recovery and reconstruction process that ensures the full ownership of affected communities and reflects the local needs?
- What is the strategic role of civil society in the overall reconstruction and recovery framework? What are the particular strengths of civil society organizations? How can these strengths best be leveraged within increasingly complex reconstruction processes?
- Development of operational and monitoring frameworks to leverage the strengths and niches of partners, ensuring services are delivered in an efficient manner.
- Mechanisms for quality assurance from national to local levels to ensure that reconstruction really does "build back better."
- Which parameters and features of the reconstruction process need to be consistent across all initiatives, and which may be allowed to vary with local preferences?

PROTECTING AND REBUILDING CRITICAL

INFRASTRUCTURE: EXPERIENCE FROM JAPAN AND OTHER COUNTRIES

BACKGROUND

The March 11 Tohoku earthquake, tsunami, and nuclear crisis dramatically illustrates modern society's dependence on critical infrastructure. In the immediate aftermath of the 9.0 earthquake and tsunami, damage to electrical, communications, and transportation systems greatly complicated emergency relief efforts. Even areas not directly affected by the events of March 11, many in Japan and others worldwide, have been impacted due to the global interdependence of many critical infrastructure sectors. As reconstruction begins, the needs of a broad mixture of stakeholders – the public directly affected by the catastrophe, government agencies at the local, prefectural, and national levels, as well as the private sector (who own and operate much of the critical infrastructure) – need to be considered.

Infrastructure is considered "critical" in reference to services it provides towards safety, security, economic stability, and the overall quality of life and community function. Critical infrastructure includes a wide range of sectors in transportation, energy, public works (water and sanitation), communication, health and emergency services (hospitals, clinics, fire departments, law enforcement, etc.), governance (continuity of government services), agriculture and food, banking and finance, and others.

The importance of infrastructure sectors locally, nationally, and even internationally depends on location and linkages. Individual facilities may be critical locally but perhaps not nationally. Other facilities – a plant that provides a key

ingredient for computer chips, for example – can impact economies in many countries. Understanding these differences involves a complex, often poorly understood set of risk assessments. The Tohoku earthquake provides perhaps the first example of how interdependent economies in many countries now share risk and vulnerability in unprecedented ways.

The characteristics of each infrastructure sector influence overall vulnerabilities. Critical infrastructure vulnerability may result from a variety of factors – unwise land use planning, poor, weak, or inappropriate structural design and construction, insufficient building codes and enforcement, poor maintenance, not understanding either single points of failure in complex networks or how cascading effects can result from damage to a single infrastructure sector, etc.[1]

Critical infrastructure inevitably represents major investments that shape the development trajectory of communities and an entire country. Recognizing both the immediate and long-term importance of critical infrastructure, rebuilding after a disaster is often challenged by pressure to quickly reinstate services and reconstruct specific components, a surge in need for technical planning expertise (particularly in urban settings), availability and cost of building materials and labor, loss or reclassification of land, and rapidly changing community dynamics, including prioritization and access to infrastructure.[2]

Both ex-ante development and post-disaster reconstruction provide windows of opportunity for increasing the disaster resilience of critical infrastructure. But sufficient planning is needed, starting with multi-hazard risk assessments that consider interdependencies, as well as pre-disaster classification of the importance and redundancies (without loss of efficiency) of key services. Risk management of critical infrastructure should include aspects of disaster prevention, mitigation, and recovery to minimize consequences. A variety of actions are needed in support of these objectives, such as improving security protocols, hardening facilities, building resiliency and redundancy, incorporating hazard

[1] International Recovery Platform, *Guidance Note on Recovery: Infrastructure* (Kobe, Japan: IRP Secretariat, 2010), http://www.recoveryplatform.org/assets/Guidance_Notes/INTERNATIONAL_INFRASTRUCTURE_220910.pdf.
[2] Ibid.

resistance into facility design, initiating active or passive countermeasures, installing security systems, leveraging "self-healing" technologies, promoting workforce surety programs, implementing cyber-security measures, training, and exercises, and business continuity planning, among others.[3]

PURPOSE

This roundtable will focus on experiences related to the 2011 Tohoku earthquake and tsunami, highlighting the challenges arising from the effects on critical infrastructure. The discussions will also consider examples of how risk assessment for complex systems can be accomplished and opportunities for integrating risk reduction into the rebuilding of critical facilities, leveraging lessons from similar experiences, such as the rebuilding of the Kobe container port after the 1995 Great Hanshin earthquake, reconstruction of key facilities following Hurricane Katrina in 2005, and upgrading the communications network after the 2010 Chile Earthquake.

SCOPE AND FOCUS OF DISCUSSION THEMES

Government and private sector representatives from Japan, Turkey, Chile, USA, and other countries will discuss:

- Classification and inter-dependency of critical infrastructure;
- Ex-ante protection and pre-disaster reconstruction planning, including highlighting a multi-hazard approach;
- Challenges and solutions of post-disaster reconstruction, including integration of risk reduction; and
- Opportunities for better protecting critical infrastructure, highlighting public-private partnerships.

[3] US DHS, *National Infrastructure Protection Plan: Partnering to Enhance Protection and Resiliency* (Washington, D.C.: United States Department of Homeland Security, 2009).

THE WAY FORWARD:

MOVING TOWARDS A SUSTAINABLE RECONSTRUCTION AND RECOVERY FRAMEWORK

BACKGROUND

The World Reconstruction Conference (WRC) is the first large-scale global conference focused on natural disaster recovery and reconstruction. The objective is to spearhead a dedicated global initiative for sharing lessons learned in disaster reconstruction and developing professional and intellectual leadership for increasing the effectiveness of future reconstruction and recovery interventions. This will include:

i) Bringing together recovery stakeholders worldwide to gather constructive feedback on both policy and technical areas of disaster reconstruction;
ii) Sharing knowledge and experience on reconstruction techniques, strategies, and program development and implementation;
iii) Catalyzing processes to review reconstruction practices and the development of cutting-edge knowledge in key areas of disaster reconstruction;
iv) Utilizing the conference platform to generate new recommendations, tools, and resources for dealing with the challenges of disaster reconstruction through a multi-stakeholder partnership; and

v) Documenting and communicating knowledge through the publication of a World Reconstruction Report (WRR), promoting the use of more consistent and unified policies, strategies, operational frameworks, and results-based monitoring and evaluation in future recovery operations. The WRR should be prepared by the summer of 2012.

The roundtable will discuss the key outcomes from the World Reconstruction Conference. It will summarize the conclusions of the thematic sessions and attempt to prioritize them in terms of need for action, integrating them into an improved model of the reconstruction process. There will also be a realistic discussion of constraints which the reconstruction community will face in trying to improve and harmonize processes. Finally, the session will attempt to lay out concrete tasks to be achieved over the next year. Priority recommendations, as identified in this session, will be delivered to the broader disaster risk reduction community and the Chair's summary of the Global Platform.

SCOPE AND FOCUS OF DISCUSSION THEMES

- **Developing an effective framework for post-disaster recovery and reconstruction** that helps to a) better define roles and responsibilities within clear institutional arrangements, b) effectively capitalize on the strengths of the various stakeholders, c) clearly place countries in the driver's seat of decision making and resource allocation, d) provide in-time relevant knowledge and lessons learned, and e) assist in establishing robust and transparent quality and result monitoring systems.
- **Preparing a roadmap for designing an improved reconstruction finance** that a) provides access to reliable reconstruction finance, b) builds capacity to manage the surge of resources, c) effectively integrates the resources of non-traditional donors, and d) taps into the financial capacity of the global capital market.
- **Providing a platform for recovery stakeholders** from across the globe to share knowledge, experiences, and know-how for the first time on a number of complex issues in disaster recovery and reconstruction with the aim of ensuring that local communities receive what they need in reconstruction.

World Reconstruction Conference

Geneva, May 10-13, 2011

Recovering and Reducing Risks after Natural Disasters

INNOVATION COMPETITION

New Approaches to Disaster Recovery and Reconstruction

IDEAS

one, many, small, big, any...

Share Your Innovative Approaches to Disaster Recovery and Reconstruction!

NEW APPROACHES TO DISASTER RECOVERY AND RECONSTRUCTION

The WRC Innovation Competition – New Approaches to Disaster Recovery and Reconstruction - was held in advance of the conference to showcase new and innovate ways that individuals and organizations have been working to address the challenges of recovery and reconstruction.

Over a period of three months, the Competition received an impressive 71 entries from 32 countries around the world. Their topics ranged from the use of solar power in recovery, seismic-resistant vernacular architecture, medical analysis using cell phones, and innovative approaches to livelihood regeneration and risk mitigation measures, among many others.

WRC Innovation Competition Entries from around the World. See www.wrc-2011.org.

A panel of 5 judges comprised of Richard Rumsey, Director of Disaster Risk Reduction and Community Resilience, World Vision International, Graham Saunders, Head, Shelter and Settlements Department, International Federation of Red Cross and Red Crescent Societies (IFRC), Peter Rottach, Chair, Climate and Disaster Risk Reduction Group, ACT Alliance, Asian Disaster Preparedness Centre (ADPC), and Tom Corsellis, Executive Director, Shelter Centre reviewed the entries and selected the top three finalists.

The Top Three Finalists:

The Use of Mulberry Branches in Home Reconstruction, Retrofit, and Repair
Behruz Dadoboev
Tajikistan

An innovative low-cost appropriate technology that uses timber framing and mulberry branches as the structural reinforcing elements on walls was introduced, tested, and applied to the reconstruction of houses after the earthquakes of 2006 in southern Tajikistan. The project has benefited some 340 families in rural areas of Kumsangir and also in Rasht District and has the potential for use not only in response to disasters but as a retrofit in existing homes for disaster mitigation.

Cost-Effective and Compact Microscopic Analysis and Diagnosis on a Cell Phone
Aydogan Ozcan
USA

This project has pioneered a lens-free on-chip imaging modality which enables converting conventional cell phones into microscopes and diagnostic devices with compact, light-weight, and cost-effective interfaces, providing an important solution to various telemedicine

needs and global health problems. These cell-phone microscopes can be used to diagnose infectious diseases such as malaria and TB, and can also be utilized for monitoring of water quality even in resource-poor settings, e.g., during disaster recovery and reconstruction conditions.

Sustainable Revival of Livelihoods in Post-Disaster Sichuan: Enhancing Eco-friendly, Pro-poor Bamboo Production Supply Chains to Support the Reconstruction Effort

Dr. Lou Yiping
China

The project focuses on driving disaster recovery and reconstruction in Sichuan Province, China, by establishing cluster-based value chains for the environmentally sustainable production of bamboo rebuilding materials. Using indigenous, renewable, earthquake-resistant bamboo, the project is expected to reduce importation of materials and generate up to 20,000 local jobs by 2013.

** The findings, interpretations, and conclusions of these projects do not necessarily reflect the views of the conference organizers or conference partners.*

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Session 3: From Assessment to Recovery and Reconstruction Planning - Closing the Loop
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Session 4: Responding to Natural Disasters in Fragile and Conflict Situations
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Session 5: Monitoring and Evaluation of Disaster Recovery Operations and Programs
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Session 6: Rebuilding Life-Important Infrastructure: The Case of Water and Sanitation
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Session 7: Lessons Learned from Large-Scale Reconstruction Operations
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Session 8: Environmentally Sustainable Recovery
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Session 9: Shaping Institutions for Reconstruction:
Options and Trade-offs
Joseph Goldberg, Manager (Ret.), World Bank

Session 10: Protecting and Empowering Vulnerable Groups in Recovery
Margaret Arnold, Senior Social Development Specialist, World Bank

Session 11: Innovations in Disaster and Climate Risk Financing for Developing Countries
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Session 12: Reviving of Livelihoods and Local Economy
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Session 13: Providing Sustainable Health and Education Services in Disaster Recovery Programs
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World Reconstruction Conference

PROCEEDINGS