The Last Mile: Delivery Mechanisms for Post-Disaster Finance

Prepared by the World Bank for the G7 Environment, Energy, and Oceans Ministers

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Governments now have access to a large and growing range of financing instruments for rapidly mobilizing funds in the aftermath of a disaster. Instruments like reserve funds, contingent lines of credit, and insurance programs are critical for financing relief, recovery and reconstruction efforts, and they have a demonstrated impact on the ability of governments to manage large-scale disasters.

The availability of financial resources however, is only half of the story. The capacity of a government to support post-disaster recovery and reconstruction depends substantially on its ability to deliver these resources effectively to where they are needed. Doing so requires that governments are prepared before a disaster hits, with the right instruments, institutions, and capacities in place. By preparing contingency plans, defining responsibilities, adopting appropriate regulations and norms, enhancing financial inclusion and insurance regulations, and establishing flexible and gender-inclusive social protection systems, governments could improve the reconstruction process and generate over $173 billion per year in benefits.

There are major synergies between the financial instruments that make the resources available and the systems that deliver these resources where they are needed. In the next few years, the design and implementation of new financial instruments will offer an unprecedented opportunity to improve the last-mile delivery of post-disaster support. This opportunity should not be missed.

† This report has been prepared by Stephane Hallegatte and Jun Rentschler, building on the World Bank and GFDRR report "Building Back Better." It benefited from inputs from Thomas Bowen, Jack Campbell, Marc Forni, and Olivier Mahul, and was edited by Nick Paul.

1. Introduction

Risk reduction and disaster prevention are critical in curbing the large human and economic costs of disasters. The devastation caused by the 2017 hurricane season in the Caribbean has shown that years of development gains can be wiped out overnight if these gains are not resilient to shocks. Likewise, any future economic growth that is built on vulnerable infrastructure and non-risk-informed policy frameworks is at risk. As the economies and populations of countries continue to grow, risk management needs to be placed at the very heart of long-term development strategies.

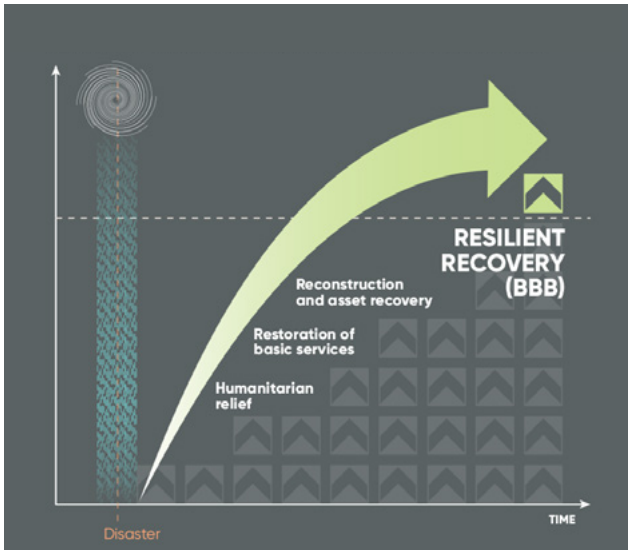
Risk-informed development strategies are key to reduce risk and avoid future disasters; however, disaster risks cannot be fully eliminated. The question is not whether another major hurricane or earthquake will strike, but when. In a changing climate, governments must be especially prepared for more intense storms, more active hurricane seasons, heavier rainfalls, and stronger coastal floods. Further, continued urbanization and population growth, especially in coastal areas, are bound to magnify these impacts of climate change in the coming decades. Prevention and risk-informed development can ensure that exposure and risk are minimized, but all economies and societies will remain exposed to residual risk that needs to be considered and addressed.

Thus, it is essential for governments to prepare in advance for future shocks; part of the challenge is to prepare the emergency response, in the hours and days that follow a disaster. Authorities can significantly improve the effectiveness of their emergency response by taking concrete measures: pre-defined evacuation routes and logistics, adequate and gender-sensitive shelters, and clearly defined roles and responsibilities for national and local authorities are all key for effective disaster preparedness. The pre-positioning of relief assets can ensure that the crisis response begins without having to rely on vulnerable transport infrastructure. Well-trained and efficiently deployed search and rescue teams are key to saving lives in the immediate aftermath of an adverse event.

But preparedness goes beyond the emergency phase to include the longer recovery and reconstruction phases, which also benefit from *ex-ante* preparedness. After the emergency phase – when the focus is on saving lives and providing humanitarian relief – comes the recovery and reconstruction period, during which basic services are restored, buildings and infrastructure are repaired, and

livelihoods and economic activities are restored to their pre-disaster level or better. Governments can significantly reduce the impact of disasters on economic growth, livelihoods, and well-being by improving the effectiveness, speed, and quality of post-disaster recovery.

Figure 1. Building Back Better (BBB): The three phases of post-disaster recovery



Effective post-disaster recovery can deliver major economic benefits. The World Bank's recent Building Back Better report estimates that by improving governments' ability to manage the recovery and reconstruction and by rebuilding better after disasters, the total wellbeing impact of natural disasters in the world can be reduced by 31 percent – a gain equivalent to $173 billion per year.[1] Building back better is particularly important in small island countries, due to their high current levels of vulnerability and their small scale. For instance, building back better could lead to an average reduction in disaster-related wellbeing losses of 38 percent in Jamaica, 52 percent in the Republic of Fiji, and 72 percent in Dominica.

These benefits would come from a recovery and reconstruction process that is…

… **faster**, so that people and businesses can recover as quickly as possible, minimizing losses in consumption and well-being.

… **inclusive**, so that every man and woman can recover and nobody stays locked in poverty due to the shock, reducing long-term impacts.

… **stronger**, so that reconstructed infrastructure, buildings, and factories can resist more intense events in the future, and countries escape the cycle of repeated disasters.

Mobilizing funds and preparing effective delivery mechanisms are key for fast and effective post-disaster recovery. The effectiveness of post-disaster response is determined by two key challenges:

1. **Mobilizing finance for managing crises**: Rapidly mobilizing the necessary funds to finance relief, recovery, and reconstruction efforts.
2. **Mechanisms for effective delivery**: Effectively channeling these funds to beneficiaries and those in charge of implementing efforts on the ground.

This note will discuss these two issues in turn, with a focus on the second challenge, i.e. the effective "last mile" delivery of post-disaster support to the right agencies, regions or municipalities, businesses, and people. The full benefits from disaster risk finance instruments – such as reserve funds, insurance contracts, or contingent financing – will be fully realized only if the resources they make available are used in an efficient and appropriate manner.

2. Mobilizing finance for managing crises

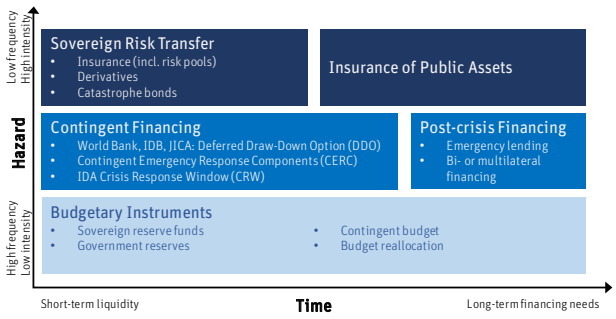
Disaster response tends to involve substantial budget reallocation, which can be costly and slow.[2] In Indonesia, district government spending has been found to vary strongly following natural disasters at the local level.[3] In the case of flooding, for example, districts reallocate spending towards sectors such as health and infrastructure, at the cost of general administration. Risk financing programs could help with stabilizing district-level spending across sectors, facilitating faster resource mobilization, and improving budgetary planning processes.

Governments that secure fast and reliable access to contingency financing are better prepared to manage future crises. In the immediate aftermath of a disaster, governments typically need to raise significant financing for response and recovery measures. Instruments to manage the impact of natural disasters on public finance and social expenditures

make it possible to maintain a more stable level of district-level spending in different sectors, and enhance public spending efficiency. Three main ways exist for governments to ensure liquidity: (i) maintaining sufficient reserve funds, (ii) arranging for contingent credit facilities, or (iii) using insurance schemes or transferring risks.

Governments can structure these financial instruments along "risk layers", with different instruments covering different types of risks (see Figure 2). By using a layered disaster risk financing strategy, countries such as the Philippines or Mexico have prepared for a wide range of contingencies. While reserve funds are used to manage low-cost, high-probability events, contingent financing and sovereign risk transfer instruments are used for high-cost, low-probability events.

Figure 2. A layered risk financing strategy[4]



2.1. Reserve funds

Governments in disaster-prone countries operate national reserve funds which are earmarked to provide immediate liquidity for financing post-disaster relief and recovery. In the Philippines, the National Disaster Risk Reduction and Management Fund and the Quick Response Fund finance a range of disaster-related expenditures. Similarly, Vietnam's State Reserve Fund (SRF) is a public fund that provides in-kind post-disaster emergency relief, including food and equipment.

However, reserve funds have limited capacities and cannot be designed to cope with the rarer and more extreme events.[5] In the Philippines, Typhoon Yolanda raised questions about the adequacy of the Quick Response Fund's volume, and the replenishment process if it is emptied by a major event or a series of smaller disasters. Vietnam has been repeatedly affected by disasters at the end of the year, when the SRF has been fully used for previous events. Maintaining large contingency reserve funds can be costly and politically challenging, especially in countries that are not affected by disasters on a regular basis.

2.2. Contingent financing

Contingent lines of credit can serve as an early financing tool while funds from other sources such as government reallocations, bilateral aid, or reconstruction loans become available. They allow countries to address an emergency without diverting resources from existing social and economic development programs. Moreover, these financial instruments provide a platform for developing integrated risk management strategies and investments that go beyond disaster response to enhance preparedness and resilience while strengthening governments' financial capacity to respond to shocks.

Multiple institutions – such as the World Bank, the Inter-American Development Bank (IDB) and the Japan International Cooperation Agency (JICA) – offer contingent lines of credit for disasters. The World Bank's Catastrophe Deferred Drawdown Options (Cat-DDOs) provide immediate liquidity following a disaster and help strengthen DRM capacity. Since 2017, Cat-DDOs are available to all members of the International Development Association (IDA) – i.e. low-income countries – and Kenya (USD 200m) was among the first to sign IDA credits with a Cat-DDO. The IDB launched its Contingent Credit Line for Natural Disasters in 2012 to help countries cover urgent financing needs that arise immediately after a natural disaster, and in 2013, the JICA established the Stand-by Emergency Credit for Urgent Recovery (SECURE), to provide immediate post-disaster financing. Contingent credit has also been successful in bringing about a dialogue on broader disaster risk management, and has been instrumental in engaging ministries of finance on the disaster risk management agenda.

The World Bank also offers Contingency Emergency Response Components (CERC) and post-disaster financing through the Crisis Response Window of the International Development Association (IDA CRW). The CERC is an additional instrument designed to support emergency response and preparedness at the project level and across sectors to quickly mobilize pre-approved funds in the face of a disaster, including disease outbreaks. It allows for the rapid reallocation of investment project funds toward urgent post-disaster recovery needs, following adequate ex-ante technical

preparation and logistical planning for its disbursement and use. For instance, a CERC was recently applied to support Jamaica with enhancing its resilience to disaster risks. Similarly, the IDA CRW provides low-income countries with additional resources to respond to severe economic crises and major natural disasters, enabling them to return to their long-term development paths.‡

2.3. Sovereign risk transfer

National catastrophe risk insurance programs can act as a last line of defense against severe natural disasters. In 2017, the Philippines launched a catastrophe risk insurance program to protect national and local government agencies against the financial losses from severe natural disasters. Under this program the Government Service Insurance System (GSIS), a public insurance agency, provides US$206 million in aggregate coverage to protect assets of the national government and 25 highly-exposed provinces. The World Bank acts as an intermediary for the transfer of GSIS's risk to a panel of international private reinsurance firms. The program complements other funding sources, such as the national and local disaster risk reduction management funds and contingent credit, that protect against less severe natural disasters.

Regional insurance mechanisms can be an effective way to pool disaster risks, and provide affordable sovereign catastrophe risk transfer to governments. The Caribbean Catastrophe Risk Insurance Facility (CCRIF) pools disaster risks across 16 countries, and provides governments with quick, short-term liquidity for financing responses and early recovery from major earthquakes or hurricanes. The Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) and African Risk Capacity are more recent examples of donor-supported regional mechanisms that offer quick-disbursing, index-based coverage against tropical cyclones and earthquakes. In addition, PCRAFI provides Pacific island countries (including the Marshall Islands) with disaster risk modeling and assessment tools.

Using catastrophe bonds, governments can leverage resources and transfer disaster risks to international capital markets. As part of its disaster risk management efforts, the Government of Mexico established the Fund for Natural Disasters (FONDEN) to support disaster relief and reconstruction. FONDEN leverages private sector financing

‡ Moreover, through the International Finance Corporation (IFC), the World Bank Group is developing contingent financing tools for private sector institutions including small and medium sized enterprises and financial institutions.

Box 1. The Global Risk Financing Facility

The Global Risk Financing Facility (GRiF) is a new financing mechanism to be established in the World Bank Group, in partnership with donor and developing-country partners. The Facility is aimed at strengthening financial resilience by investing in more timely and reliable crisis response and recovery systems. It will achieve this by (i) establishing and scaling up pre-arranged climate and disaster risk financing instruments, including through market and non-market based insurance mechanisms; (ii) developing new instruments for contingent financing, e.g., concessional grants/credits, interest rate buy-down; (iii) piloting innovative approaches such as risk transfer mechanisms in infrastructure finance, which, where proven effective, could be mainstreamed into conventional toolkits over time; and (iv) addressing increased risk in fragile and conflict-affected countries, in partnership with humanitarian actors.

GRiF will be implemented through a Multi-Donor Trust Fund with an expected contribution of US$180M from Germany and UK, with other potential contributions under discussion. This includes an initial $30M contributed by Germany and UK through the InsuResilience Climate Risk Financing and Insurance Program. The GRiF will be a member of the Programme Alliance of the InsuResilience Global Partnership. It will be implemented by the World Bank, including the newly established World Bank Disaster Risk Finance and Insurance hub of the Centre for Global Disaster Protection in London. GRiF will complement the existing climate finance and crisis finance architecture, focusing on scaling up and strengthening risk financing initiatives to reduce the burden on existing crisis response mechanisms such as the Crisis Response Window.

as part of a strategy that layers risk retention and risk transfer instruments. In 2006, FONDEN issued a $160 million catastrophe bond to transfer Mexico's earthquake risk to the international capital markets. Though costly, financial schemes like this can disburse funds more rapidly than public budgets. And by predefining payout rules for allocating post-disaster support, formal insurance and financial products can reduce political economy biases and improve transparency and predictability.

2.4. The cost and benefits of financial instruments

The choice of financial instruments is determined not only by their functionality, but also their cost. Table 1 provides an indicative cost multiplier for different financial risk instruments. The cost multiplier is defined as the ratio between the cost of the financial product (such as the premium of an insurance product, or the expected net present value of the cost of a contingent debt facility) and the expected payout over its lifetime. A ratio of 2 indicates that the overall cost of the financial product is likely to be twice the amount of the expected payout made over a long period of time. The speed at which funds can be obtained is also determined by the underlying legal and administrative processes.[5]

Financial instruments cannot be compared solely by their financial costs and volumes. Other important considerations include the speed of disbursement, and the transparency and predictability of the resources. Rule-based instruments – such as index insurance products or risk transfer mechanisms based on measurable indicators – provide governments, technical agencies, local authorities, firms, and households with a predictable amount of support. This makes it possible for them to design their own response (e.g., taking their own insurance contract). From a government perspective, it also helps build discipline in how post-disaster resources are mobilized and used.

Timeliness of support is essential for efficient coping and recovery. While there is no global estimate of the cost of delaying the provision of post-disaster support, there is agreement that this cost is far greater than the financing costs. Evidence from Ethiopia shows that every US$1 secured in contingency financing for timely and predictable disbursement for emergencies can save up to US$5 over the long term.[6] However, delivering this support depends not only on the availability of resources, but also on the preparation of effective and transparent delivery mechanisms.

Table 1. Cost multipliers of different financial instruments for risk management[7]

Instruments	Indicative cost multiplier	Disbursement (months)	Amount of funds potentially available
Ex-post financing			
Donor support (humanitarian relief)	0-1	1-6	Uncertain
Donor support (recovery and reconstruction)	0-2	4-9	Uncertain
Budget reallocations	1-2	0-9	Small
Domestic credit (bond issue)	1-2	3-9	Medium
External credit (e.g., emergency loans, bond issue)	1-2	3-6	Large
Ex-ante financing			
Budget contingencies	1-2	0-2	Small
Reserves	1-2	0-1	Small
Contingent credit	1-2	0-1	Medium
Parametric insurance	1.3 and up	0-2	Large
Alternative Risk Transfer (for example CAT bonds, weather derivatives)	1.5 and up	1-6	Large
Traditional (indemnity-based) insurance	1.5 and up	2-12	Large

3. Mechanisms for effective delivery

Even if post-disaster funds are successfully mobilized, their effective delivery can remain a serious challenge. It is indeed common to see post-disaster support to affected populations and for reconstruction work being delayed by months, even in place where financial resources are available. Delays can result from multiple causes, including a lack of clearly defined responsibilities and accountabilities, the need for data collection to provide support to heavily affected households, and procurement issues for debris removal or reconstruction work.

By establishing effective mechanisms for delivering post-disaster financing, governments can substantially reduce the economic and well-being impact of natural disasters. Governments need to ensure effective "last mile" delivery of post-disaster to those who need them: (i) national agencies, local authorities, or private-sector providers which are in charge of restoring infrastructure services; (ii) businesses, to help them restart production and protect jobs; and (iii) households, to help them smooth the impact of the shock, and to recover. The design of these delivery mechanisms should be informed by three imperatives for the reconstruction phase: reconstruction that is faster, more inclusive, and stronger.

3.1. Building back faster: ensuring that funds can be delivered and used rapidly

Streamlined administrative processes for delivering

resources to the right agencies and regions are essential. In December 2004 an earthquake and subsequent tsunami killed 221,000 in Aceh, Indonesia, alone. Nearly US$7 billion in contributions flowed in from the Indonesian government and international donors, and nearly ten percent of these funds were contributed through the Multi Donor Fund for Aceh and Nias (MDF).[8] Based on this experience, Indonesia established strong policies and institutions, including the newly-formed National Board for Disaster Management (BNBP) and the Indonesia Disaster Fund (IDF), which is largely modeled on the Aceh MDF. These institutions have helped to significantly streamline the post-disaster processes for rapid response and recovery in the country.

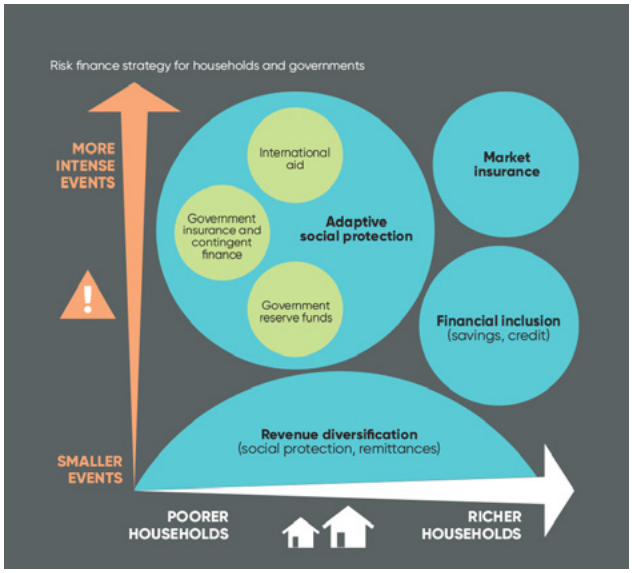
Several key principles are now integral to Indonesia's disaster risk management and response strategy, a major objective of which is building back faster. For example, the government follows a phased approach that prioritizes the rapid rebuilding of homes and basic services (e.g. sanitation), then progresses to non-essential infrastructure, and finally to economic development. It has also established streamlined budgetary processes to ensure that funds can be disbursed and transmitted quickly and efficiently to where they are most needed. In addition, all recovery projects integrate cross-cutting elements, including community-based decision-making, disaster risk reduction, capacity building, gender inclusiveness, and environmental protection.

The ability to finance a quick recovery depends on actions taken before disaster strikes. These actions might include the development of realistic recovery plans, the strengthening of local agencies, the identification of providers for debris removal and reconstruction, and the clear assignment of responsibilities. The Government of Turkey started implementing a seismic risk management and emergency preparedness project in 2005, guided in part by the lessons of the 1999 Marmara earthquake. The package of measures included improving public awareness and institutional capacity of local public safety organizations, modernizing emergency communications and information systems, and expanding existing emergency response capacities.[9] Moreover, central and local authorities prepared disaster response plans that define responsibilities and identify all service groups – including those from the private sector – needed for an efficient recovery. The overall objective of this emergency management system was to improve the ability of authorities at all levels to mobilize resources rapidly and effectively, and to jump-start debris removal and reconstruction in a pre-arranged and well-coordinated manner.

3.2. Building back more inclusively: ensuring that every man and woman recovers

It is important to provide support to the people who really need it. This is particularly challenging in the context of natural disasters, which have heterogeneous impacts and require swift delivery of support. There is no single tool that can cover all households or businesses, and all events – instead, a combination of measures is required (Figure 3). For example, richer households and businesses are more likely to be able to rely on their ability to access formal loans or buy insurance. Poorer people are more often reliant on informal risk sharing mechanisms at the community level or social insurance provided by the government. Exceptional, large-scale catastrophes – such as the Haiti earthquake in 2011 – cannot be managed with the same instruments as those deployed in the case of more frequent and relatively minor shocks – such as recurring drainage-related flooding. Insurance and contingent finance are essential in the management of rare disasters, while savings, reserve funds, and revenue diversification are more cost-effective for managing frequent shocks.

Figure 3 – A combination of tools is necessary to protect different households from different shocks[10]



3.2.1. Financial inclusion: the benefits from saving instruments and access to borrowing

Financial services, especially savings instruments and access to borrowing, are critical to the ability of households and firms to manage shocks.[11] Inclusive access to financial services reduces the need for publicly-funded post-disaster interventions by increasing the ability of households and firms to manage their own risks. For example, in Accra, Ghana, households with access to emergency borrowing were found much more likely to recover quickly from the 2015 floods.[12] In fact, several countries (including Pakistan and Nepal) were able to make significant progress with expanding access to financial services as part of owner-driven post-disaster reconstruction programs.

Financial inclusion is on the rise globally, but not consistently so, and the global gender gap in financial inclusion has not improved since 2011. 515 million adults have opened bank accounts since 2014 – but gains are uneven across and within countries, and between men and women.[13] Progress has been accelerated by mobile phones and the internet. However, some countries are still lagging, with men more likely than women to have a bank account. In the Middle East and North Africa, for example, 52 percent of men have bank accounts, but only 35 percent of women – the greatest gender gap of any region.

By improving financial inclusion, governments can also improve the effectiveness with which social support is delivered to disaster-struck population groups. Financial inclusion can significantly reduce the transaction costs and administrative challenges of delivering social protection. Mobile phone-based payment schemes, by providing broadly accessible financial services, can also increase the speed and cost-effectiveness with which cash transfers can be disbursed in the case of a disaster. In Kenya, all households from the four counties covered by the Hunger Safety Net Program are preregistered, and they have been provided with bank accounts to ensure quick delivery of cash transfers after an emergency or a crisis. This was critical in the ability of the program to provide comprehensive support over two weeks during the 2015 drought.

3.2.2. Market insurance: a critical tool, with some limitations

Market insurance can protect against larger losses. This is especially the case for relatively well-off people or businesses, with asset bases large enough to justify the use of an insurance contract. Domestic insurance markets have proved an effective channel for building resilience, especially through public-private partnerships. The Turkish Catastrophe Insurance Pool (TCIP) and the Mongolian Livestock Insurance Pool are good examples of public-private partnerships that provide insurance coverage against natural disasters. In both cases, the domestic insurance market provides the mechanism through which governments reach households and businesses with insurance products. While these programs have substantially increased insurance penetration at the local level, replication in other countries requires careful tailoring to local contexts. Governments may also explore regulatory reforms to make insurance coverage, particularly for seismic risk, mandatory for households with mortgages.

The success of these schemes will likely be replicated elsewhere. The World Bank–supported South-East Europe and the Caucasus Risk Insurance Facility initiative is working to build a sustainable mass market for standardized catastrophe risk insurance products in participating countries. It offers options for reinsurance, standardized products, and web-based tools for underwriting and accumulation management through a specialized regional reinsurer, Europa Re.

However, efforts to provide universal access to insurance face multiple obstacles, especially for poor people. These include weak institutional and legal capacity, high transaction costs, and other affordability issues. Nevertheless, there is strong complementarity between market insurance and social protection, with insurance providing protection for the middle class, while adaptive social protection is most efficient when focused on the poor. Even if it covers only the nonpoor, market insurance can generate major resilience gains and reduce the financial pressure on the government: with reduced need to support the middle class after a disaster, it can focus its resources on the poorest and most vulnerable.

3.2.3. Adaptive social protection systems for delivering post-disaster assistance

Social protection schemes increase the resilience of the covered population, even if they do not include the risk from natural disasters in their design. This is because these schemes – such as cash transfers, public work programs, or school lunch programs – diversify people's income, reduce their expenses, or provide them with a source of revenue that is not as affected by shocks as their other income sources.

Existing social protection schemes can be used to transfer post disaster support to those who need them most – including women and marginalized groups. Fiji's social protection system, for example, has evolved over the years to be gender-sensitive and rapidly responsive. In 2016, the category 5 Tropical Cyclone Winston struck Fiji, leaving behind severe destruction. The strength of the existing social protection system allowed the government to provide support swiftly and efficiently. The government scaled up its three main social assistance programs to provide top-up payments to existing beneficiaries, including particularly vulnerable groups such as women and pensioners. The cash top-up payments were intended to help people meet immediate recovery costs, and were provided to all existing beneficiaries, irrespective of whether they resided in the affected areas.

An impact evaluation of Fiji's response to cyclone Winston showed that the social assistance funds were primarily used for emergency consumption and reconstruction.[14] Within four weeks of the cyclone, the majority of households had spent their entire additional social assistance, primarily on essential items such as food and reconstruction materials. The evaluation shows that three months after the cyclone, beneficiaries of the Poverty Benefit Scheme were more likely to have recovered than comparable households that did not receive the additional assistance. It was estimated that this support had a benefit-cost ratio greater than 4, and reduced the impact of Tropical Cyclone Winston on the poorest Fijians by more than 20 percent.[15]

Social insurance and social safety nets are more efficient if they are "adaptive," meaning that they can react quickly to shocks. Adaptive social protection systems can improve their support for poor people affected by disasters or environmental and economic shocks in two ways. They can increase the number of beneficiaries through horizontal scale out, as in Ethiopia's Productive Safety Net Program, and they can the increase amount of support provided to existing beneficiaries through vertical scale up, as in Fiji's social safety net system. The Sahel Adaptive Social Protection Program (ASPP) supports the design and implementation of such systems in six Sahel countries (Burkina Faso, Chad, Mali, Mauritania, Niger, and Senegal).

Box 2. Universal health coverage contributes to resilience to natural disasters.[10]

Disaster risk insurance is not the only type of insurance that can boost resilience; health insurance is also critical to the management of natural risks. Natural disasters cause injuries and disabilities, and health shocks tend to push households into poverty, particularly where people have to borrow at high interest rates to access care.[16] The World Health Organization (WHO) estimates that about 100 million people fall into poverty each year just to pay for health care.[17] Better health care coverage and lower out-of-pocket expenses help the poor to manage catastrophic health expenditures and are thus efficient ways of reducing the health impacts of natural disasters and poverty.[18] Provision of health coverage is possible at all income levels: Rwanda has invested in a universal health coverage system that today insures over 80 percent of the population. Context and implementation challenges will however continue to determine the optimal path for individual countries.

Box 3. Timeliness vs. Targeting: the trade-off in identifying those the most in need

In the aftermath of a disaster it can be difficult to identify vulnerable households. The impacts of disaster are often heterogeneous, making geographic or demographic targeting approaches difficult. However, case studies suggest that the cost of a drought to households can increase dramatically if support is delayed, mainly due to irreversible impacts on children and asset holdings.[6] Moreover, data is also very scarce on how losses are distributed within households, or across vulnerable groups such as women, children, the elderly, and disabled.[19]

To prepare for disaster, governments can develop large and flexible social registries. These include both potential and existing beneficiaries, with adequate information to identify the most vulnerable households. In Brazil, the Cadastro Unico registry includes households with a per capita income higher than the eligibility threshold of existing social programs. These may not currently be beneficiaries of social protection, but as they are considered to be vulnerable to shocks, they can be supported in a crisis.

Post-disaster responses can occur in multiple stages. Initial, survival-related support can be delivered quickly, even at the expense of accurate targeting, with more substantial and better-targeted reconstruction support provided later. In Pakistan after the 2010 floods, the government implemented the Citizen's Damage Compensation Program (CDCP). This cash grant program included two phases, to better balance the urgency of post-disaster support and the need to carefully target the larger transfers supporting reconstruction.

Adaptive social protection schemes can help prevent humanitarian emergencies and long-term poverty traps.[20] In Ethiopia, rural farmers affected by drought in 2005 and 2011, and covered by the Productive Safety Net Programme had consumption losses 25 percent lower than those of other rural farmers.[21] Similarly, during a severe drought in 2015, Kenya's Hunger Safety Net Programme delivered support to more than 100,000 households, and added a special transfer to 200,000 households in anticipation of further droughts.

Adaptive social protection programs and action through existing systems can help to cut intervention costs, and thus save money for governments, donors, and tax payers.[21] Because these systems are relatively flexible and fast, they can reach people in affected areas and prevent last resort coping measures such as cutting down on food or taking children out of school, and they do it efficiently because they rely on existing systems. Post-disaster transfers are estimated to have a benefit-cost ratio above 1.3 in the 117 countries studied in the World Bank's Unbreakable report.[10] And in 11 countries, every $1 spent on post-disaster transfers yields well-being benefits of more than $4.

Provision of rapid support to poor people cannot be easily improvised when a disaster occurs – thus preparation and alignment with risk financing are crucial. Already before a crisis, social safety nets need to be developed that can be scaled out or up rapidly following a shock to deliver adequate support to those who need it. This preparation needs to comprise detailed designs features of the program, including a registry of beneficiaries; a robust financing strategy, including strong linkage with risk financing; and the definition of clear institutional arrangements, including with non-governmental actors such as financial service providers.

3.2.4. Delivery mechanisms to support women and marginalized population groups

Regardless of the financial instruments used, building back more inclusively means to design delivery mechanisms that support women and marginalized population groups. Disasters can have severe long-term consequences for some households, for instance when people become locked in poverty traps because their asset base has fallen below a

critical threshold. Marginalized and disadvantaged groups are especially at risk of experiencing such poverty traps, not least because they tend to have fewer support systems available to them. Gender inequality in disaster impacts has been widely reported, and a disproportionate impact on children is well-established.[22, 23, 24]

The financial resilience of the poorest can be strengthened through gender-sensitive programs. Uganda is strengthening the financial resilience of the poorest through a large social protection and labor intensive public works (LIPW) program. In the case of a drought, a crisis response mechanism automatically scales up assistance and enables rapid, transparent, and evidence-based provision of additional assistance to affected households. The public works component requires that at least 40 percent of LIPW participants are women. To achieve this target, the program ensures that activities are located close to villages and appropriately meet the needs of women. Gender-sensitive measures are central to all project activities, including community engagement processes, decision making, and monitoring.

More generally, social protection and livelihoods programs can often be made more sensitive to women by applying simple rules.[25] Examples include collaborating with community-based organizations or women's groups that have already established contacts with poorer female community members; taking into account gender differences in literacy, mobility, access to public venues, labor schedules (for example, day fishermen/factory workers may only be available in the evening), and preferences for the means of participation; setting and enforcing quotas for female participation in programs; where available, opening bank accounts in women's names or jointly with the male heads of household; and ensuring grievance procedures are accessible to poor women and men.

3.3. Building back stronger – or ensuring that reconstruction reduces future risks

Reconstruction phases provide rare opportunities to reduce the vulnerability of affected regions and countries.[26] This can be achieved in part through risk-informed construction standards and smart spatial planning. For example, the large-scale physical destruction experienced in 2017 by several Caribbean island states, including Dominica and Antigua & Barbuda, offers the opportunity to ensure that destroyed assets are reconstructed to more resilient standards, able to withstand more intense events in the future.

Infrastructure can be strengthened and services improved after a disaster. In 2008, an 8.01 magnitude earthquake struck southwestern China, causing 69,000 fatalities and the destruction of 34,000 km of highways, thousands of schools, hospitals, and wastewater systems, as well as more than 4 million homes. In response to this disaster, the government ensured that the reconstruction of affected infrastructure followed higher seismic standards and flood risk management codes. In fact, the restored infrastructure was not only built to be more resilient to natural hazards than before the disaster – it also enhanced access to and service quality of essential public services, including water, sanitation, roads, health and education.

Schemes may be developed to ensure that resources are used for specific resilient reconstruction purposes and delivered directly to those leading actual reconstruction efforts on the ground. When tropical cyclone Winston struck Fiji in 2016, it destroyed about 30,000 houses. A massive rebuilding and recovery effort got underway, led by the Government of Fiji and supported by numerous relief and development organizations. Through its "Help for Homes" program, the government offered grants, materials, and technical training to assist people in the construction and reconstruction of safer and more resilient homes – ensuring that houses and people could better withstand future cyclones.

In practice, the foundation for building back stronger is best laid before a disaster. The G7 Ise-Shima Principles for Promoting Quality Infrastructure emphasize the importance of resilient infrastructure. To this end, strengthening the institutional and technical capacities of public and private sectors is crucial for ensuring that there is sufficient design, construction, and quality assurance capacity in a post-disaster situation. This should extend from building officials at all levels of government to contractors and individual builders, masons, and carpenters.

It is critical to ensure that businesses and agencies reconstruct according to modern building codes and risk-informed designs. To ensure that resources are indeed used to rebuild stronger infrastructure, without delaying reconstruction

in an unacceptable manner, governments have taken measures to pre-identify and contract firms with suitable expertise and to pre-approve resilient reconstruction designs. In Nepal, for instance, the government had several pre-approved reconstruction designs ready to be used as standards for the large-scale resilient reconstruction effort that followed the devastating 2015 earthquakes.

4. Conclusion

The ability of a government to support post-disaster recovery and reconstruction depends critically on its ability to deliver resources effectively where they are needed. The availability of financial resources for post-disaster response is only half of the story: to deliver resources effectively, governments need to be prepared before a disaster hits, with the right instruments, institutions and capacities in place. Through the right combination of measures, governments could accelerate and improve the reconstruction process in a way that can generate more than $173 billion per year in benefits. These measures include contingency plans, clearly defined responsibilities in disaster aftermath, pre-approved contracts for debris removal and reconstruction, appropriate regulations and norms, enhanced financial inclusion and insurance regulations, and "disaster-ready" social protection systems.

There are major synergies between the financial instruments that make the resources available and the systems that deliver these resources where they are needed. The reserve funds, contingent lines of credit, or insurance programs that are being created today offer great opportunities to also optimize the "last mile" delivery of post-disaster support to affected households and businesses, and to the agencies responsible for recovery and reconstruction. With more transparent and predictable resources, it is easier to design delivery mechanisms that are more disciplined, more efficient, and better able to minimize the long-term impacts of natural disasters.

Endnotes

1 Hallegatte, S., Rentschler, J. & Walsh, B. Building Back Better: Achieving Resilience through Stronger, Faster, and More Inclusive Post-Disaster Reconstruction. (2018).

2 Cevik, S. & Huang, G. How to Manage the Fiscal Costs of Natural Disasters. (2018).

3 Skoufias, E., Strobl, E. & Tveit, T. The reallocation of district-level spending and natural disasters: evidence from Indonesia. (2018).

4 World Bank. Sovereign Catastrophe Risk Pools. (World Bank, Washington, DC, 2017).

5 Mahul, O. & Ghesquiere, F. Financial protection of the state against natural disasters : a primer. (2010). doi:10.1596/1813-9450-5429

6 Clarke, D. J. & Hill, R. V. Cost-Benefit Analysis of the African Risk Capacity Facility. IFRI Discuss. Pap. 01292 1–64 (2013). doi:10.2139/ssrn.2343159

7 World Bank. Sovereign Catastrophe Risk Pools : World Bank Technical Contribution to the G20. (The World Bank, 2017).

8 World Bank. Indonesia: A Reconstruction Chapter Ends Eight Years after the Tsunami. 5–8 (2012).

9 World Bank. The Istanbul Seismic Risk Mitigation Project. (2016).

10 Hallegatte, S., Vogt-Schilb, A., Bangalore, M. & Rozenberg, J. Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters. (The World Bank, 2016). doi:10.1596/978-1-4648-1003-9

11 World Bank. Risk and Opportunity: Managing Risk for Development. (2013).

12 Erman, A. et al. The Road to Recovery: The Role of Poverty in the Exposure, Vulnerability and Resilience to Floods in Accra. (The World Bank, 2018). doi:10.1596/1813-9450-8469

13 Demirguc-Kunt, A., Klapper, L., Singer, D., Ansar, S. & Hess, J. The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution. (The World Bank, 2018). doi:10.1596/978-1-4648-1259-0

14 Mansur, A., Doyle, J. & Ivaschenko, O. Cash Transfers for Disaster Response: Lessons from Tropical Cyclone Winston. (2018).

15 World Bank. Climate vulnerability assessment : making Fiji climate resilient. (2017).

16 Krishna, A. Who became poor, who escaped poverty, and why? Developing and using a retrospective methodology in five countries. J. Policy Anal. Manag. 29, 351–372 (2010).

17 WHO | Research for universal health coverage: World health report 2013. WHO (2014).

18 Jamison, D. T. et al. Global health 2035: a world converging within a generation. Lancet 382, 1898–1955 (2013).

19 Twigg, J., Lovell, E. & Kett, M. Disability inclusion and disaster risk reduction: Overcoming barriers to progress. (2018).

20 Ninno, C., Coll-black, S. & Sahel, P. F. Protecting the Vulnerable in the Drylands : The Role of Social Protection The need for social protection in Africa. (2016).

21 Porter, C. & White, E. Potential for application of a probabilistic catastrophe risk modelling framework to poverty outcomes: General form vulnerability functions relating household poverty outcomes to hazard intensity in Ethiopia. (2016). doi:10.1596/1813-9450-7717

22 Kousky, C. Impacts of natural disasters on children. Futur. Child. 26, 73–92 (2016).

23 Hoddinott, J. Shocks and their consequences across and within households in rural Zimbabwe. J. Dev. Stud. 42, 301–321 (2006).

24 Rose, E. Consumption Smoothing and Excess Female Mortality in Rural India. Source Rev. Econ. Stat. 81, 41–49 (1999).

25 Holmes, R. & Jones, N. How to design and implement gender-sensitive social protection programmes | Overseas Development Institute (ODI). (2010).

26 UN-ISDR. Build Back Better. (2017).