Guidance Note

Financing Post-Disaster Recovery and Reconstruction Operations: Developing an institutional mechanism to ensure the effective use of financial resources

November 2013

This guidance note provides policy makers with an operational framework to establish an institutional mechanism for financing post-disaster recovery and reconstruction operations. It is based on international experience, in particular that of Mexico due to its pioneering initiatives to develop comprehensive disaster risk management programs, including the fiscal management of disaster risks. The guidance note consists of six key steps to ensure effective procedures for resource mobilization, allocation, and execution. It serves as an outline for a series of six short notes, provided separately, which offer further detail on each of the six key steps.

The six accompanying short notes provide guidance to: (i) Quantify (implicit and explicit) contingent liabilities associated with natural disasters; (ii) Formalize the process for declaration of disasters and financing contingent liabilities; (iii) Clarify post-disaster financial responsibilities of the central and local governments; (iv) Mobilize resources ex-ante through a DRM fund and financial protection strategy; (v) Allocate resources based on damage and loss assessment methodology; and (vi) Execute resources and coordinate efforts across the post-disaster recovery and reconstruction process.

Introduction

Disasters can inflict extreme economic and fiscal tolls and create major explicit or implicit contingent liabilities for the government budget. In Thailand, the 2011 floods resulted in approximately US$45 billion of damage and losses and required government spending worth five percent of the government’s annual revenues. The adverse impact on the fiscal balance, in relative terms, is even more pronounced in lower-income and small-island countries; the damages from the 2009 tsunami in Samoa amounted to approximately 15 percent of GDP, and hurricanes affecting the Caribbean islands can inflict damages exceeding 100 percent of GDP, as was in Grenada in 2004. As governments shoulder increasing post-disaster expenditures, natural disasters represent a growing challenge to public financial management particularly in low- and middle-income countries.

There is an urgent need for governments to better understand, manage, and reduce the financial and fiscal impacts of natural disasters. World leaders are increasingly calling for stronger and systematic integration of disaster risk management and financing into development planning. Recent initiatives by the G20 and APEC highlighted the importance of financial resilience against disasters, and the Sendai Dialogue at the 2012 IMF-World Bank Group Annual Meetings demonstrated commitment to the topic at the highest levels. The World Development Report 2014, Managing Risk for Development, emphasizes the role of risk management in the development agenda.

This guidance note provides policy makers with an operational framework to develop an institutional mechanism to finance timely and effective post-disaster recovery and reconstruction operations. Developing sustainable and effective disaster risk financing strategies against disasters can help governments mobilize funds to address the potential financial needs and manage volatility on the fiscal accounts. Equally important are the administrative and legal procedures to ensure that the available resources are used effectively in the aftermath of a natural disaster, such as the legal framework for emergencies, budget appropriation and execution, and fiduciary control and management of the funding channels.

The operational framework outlines six steps for consideration to operationalize the resources mobilized through disaster risk financing strategies (Figure 1). Each of the six steps is further elaborated in an accompanying series of six short notes.
The six steps are arranged sequentially; steps one through four are completed in advance of a disaster. Steps five and six are implemented following the occurrence of a natural disaster.

**This guidance note builds primarily on the experience of Mexico.** Mexico is leading amongst emerging countries in its public financial management of natural disasters. Since its inception in 1996 as a single budget line in the Federal Budget Expenditure, Mexico’s financing mechanism for post-disaster activities has significantly evolved into an advanced inter-institutional financial vehicle with a sophisticated disaster risk financing strategy.

**Figure 1. Six steps towards effective post-disaster public financial management**

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*Source: Authors*

**Sovereign Disaster Risk Financing**

**Ex-ante Disaster Risk Financing and Insurance (DRFI) strategies increase the budget response capacity of the government in the immediate aftermath of a disaster, while managing the volatility on fiscal accounts.** In the aftermath of a natural disaster, governments face immediate funding needs for emergency relief and recovery operations, while the majority of funds are required several months later for the reconstruction program. Effective DRFI strategies reflect this time dimension and provide governments with immediate liquidity to address pressing needs, while minimizing disruption on the provision of essential public services.

An optimal DRFI strategy addresses different layers of risk through combining a number of financial instruments to match the associated financial needs, depending on the frequency and severity of disaster risks. An optimal strategy begins bottom up and first relies on risk retention through budget mechanisms such as a dedicated budget line for a Disaster Risk Management (DRM) fund. This can be complemented by a contingent line of credit for intermediate layers of risk such as the World Bank Development Policy Loans with Catastrophe Deferred Drawdown Option (Cat DDO). For the high-risk layer it can leverage the private sector through risk transfer schemes such as traditional and/or parametric (re)insurance and capital market options (Figure 2).

**Figure 2. Three-tiered, risk-layering strategy**

*Source: Ghesquiere and Mahul (2010)*

**In the absence of DRFI strategies governments rely on ex-post resources in the aftermath of a natural disaster.** This can include drawing funds from general contingency budgets, taking out domestic or international credit, increasing taxes, or seeking donor assistance. While these ex-post financial resources do not require advanced planning, they can be disruptive for previously planned social programs and investments, difficult to predict, politically unpopular for government leaders, and in the case of donor assistance, often earmarked for pre-identified expenditures or unreliable. It may take months to obtain resources through ex-post financial instruments, leading to delays in the relief, recovery, and reconstruction process.
In many cases, governments simply do not have funds available for post-disaster activities to take place at a sufficient level. Ex-ante DRFI strategies can help the government quickly mobilize some amount of immediate liquidity for crucial emergency relief operations and to begin the recovery and reconstruction process in a timely manner.

**Establishing an Institutional Mechanism to Finance Post-Disaster Recovery and Reconstruction Operations**

An institutional mechanism to finance post-disaster recovery and reconstruction operations can help ensure timely and appropriate use of resources mobilized through a DRFI strategy. Developing such a mechanism, which addresses the full chain of ex-ante resource mobilization, and ex-post resource allocation and execution, in parallel with an integrated sovereign disaster risk financing strategy can help to better manage the fiscal risk of natural disasters. For instance, the Government of Mexico (GoM) has been strengthening its financial management of natural disaster risk and related institutional arrangements since the late 1990s. A critical component of this effort has been the establishment of the Natural Disaster Fund (FONDEN) to address the GoM’s dual challenge of financing disasters and allocating and executing post-disaster resources efficiently and transparently across all levels of government (Box 1).

**Box 1. Mexico’s Natural Disaster Fund, FONDEN**

Mexico is highly exposed to multiple natural hazards of varying magnitude on a recurrent basis. From 1999 to 2011, the GoM’s expenditure on post-disaster relief, recovery, and reconstruction of public assets and low-income housing averaged to nearly US$1.5 billion per year. In response to the continued need for ex-post budget reallocations, the Government of Mexico (GoM) established the Natural Disaster Fund (FONDEN) in the late 1990s as a mechanism to support the rapid rehabilitation of federal and state infrastructure affected by adverse natural events. Created as a budget line in the Federal Budget Law in 1996, FONDEN became operational in 1999 as an inter-institutional financial vehicle central to the GoM’s ability to enact swift relief, recovery, and reconstruction efforts in the aftermath of a natural disaster.

Multiple budget accounts have enabled FONDEN to provide more effective financing for the disaster risk management cycle. FONDEN’s original and primary budget account is the FONDEN Program for Reconstruction which provides resources to rehabilitation and reconstruction programs focused on (i) emergency assistance to affected populations; (ii) public infrastructure at the three levels of government (i.e., federal, state, municipal) and certain components of the natural environment (e.g., protected natural areas, rivers, forestry); and (iii) low-income housing.

The FONDEN Program for Reconstruction is linked to an associated financial account, the FONDEN Trust. In the aftermath of a natural disaster, funds committed to specific relief, recovery, or reconstruction activities will be transferred from the FONDEN Program for Reconstruction to a subaccount in the FONDEN Trust. The FONDEN Trust holds these resources until the implementing entities, such as service providers, submit invoices and documentations for the specific activities. At that point, the fiduciary agent, the Mexican Development Bank BANOBREAS, makes payments directly to the service providers implementing the specific activities.

FONDEN also functions as the centerpiece and the operator of the GoM’s disaster risk financing and insurance strategy. In addition to its annual budget allocations of approximately US$800 million, which is required by law, FONDEN utilizes market-based risk transfer instruments such as indemnity-based reinsurance and a multi-peril catastrophe bond.

Since its creation, FONDEN has evolved significantly from a simple budget line. Its operational responsibilities now include broader disaster risk management activities beyond funding post-disaster relief, recovery, and reconstruction activities. They include the funding of risk assessments, risk reduction and prevention activities, rebuilding infrastructure at higher standards for greater resilience (the “build back better” principle), as well as contracting risk transfer instruments (e.g., parametric insurance, excess of loss insurance coverage, cat bonds).

The following six key steps aim to guide governments in establishing an institutional mechanism to finance post-disaster recovery and reconstruction operations. The steps have been distilled from international experience drawing primarily on Mexico, as it stands at the forefront of emerging countries on initiatives to develop comprehensive disaster risk financing and insurance strategies and mechanisms embedded into disaster risk management programs and structures.
1. Quantify (implicit and explicit) contingent liabilities associated with natural disasters

**Assessing the government’s financial exposure to natural hazards is a critical first step to develop an ex-ante DRFI strategy and institutional framework for the financial management of natural disasters.** Fiscal risk assessments help the government understand the potential financial impact of disasters on public accounts and the economy. Robust data building on both historic and simulated disaster loss information is an essential for starting point for such a risk assessment. Historic disaster loss data provide information on the more frequent losses caused by less severe, recurrent events and can be obtained through government records on post-disaster budget allocations. Disaster losses caused by infrequent catastrophic events inherently have sparse records and must be simulated using probabilistic catastrophe risk models. Specific input databases are required to develop the probabilistic catastrophe risk model: (i) a consolidated database of all historical events, and (ii) a geo-referenced inventory of public assets at risk and their attributes.

**A range of tools is available to countries to assess, model, and visualize their disaster risks.** Beside catastrophe risk models offered by commercial firms, international initiatives increasingly provide open-source catastrophe risk models such as the Comprehensive Probabilistic Risk Assessment Program (CAPRA), the Global Earthquake Model, and the Global Flood Model. National models have been developed by local universities for the governments, as is the case in Mexico and Colombia. In Mexico, the GoM has built on “R-FONDEN,” a Loss Estimation Risk System developed with the National University of Mexico that provides probabilistic catastrophe risk analysis (Box 2). This innovative system has informed the GoM’s fiscal and budgetary decisions, such as the annual allocation amount for FONDEN and the design of FONDEN’s risk transfer instruments including the series of parametric cat bonds and the indemnity-based excess-of-loss insurance treaty.

**Box 2. R-FONDEN and loss estimation in Mexico**

“R-FONDEN” is a Loss Estimation Risk System developed by the National University of Mexico for the Government of Mexico (GoM). This innovative system has formed the basis of the GoM’s fiscal and budgetary decisions, including the annual budget allocation for FONDEN, Mexico’s Natural Disaster Fund. R-FONDEN provides probabilistic catastrophe risk analysis for four major perils (earthquake, flood, tropical cyclone, and storm surge) for infrastructure in key sectors (education, health, roads and bridges, hydraulic infrastructure, and low-income housing) at the national and subnational levels. The losses are estimated from a database integrated with geocoded information for main public assets, including structural characteristics and replacement values. The analysis can be performed on a scenario basis (i.e., particular hazard or event) or on a probabilistic basis to estimate the potential material and human losses for any geographic area. In each simulation, R-FONDEN generates an estimation of the Annual Average Loss; Exceedance Probability Curve (i.e., annual frequency for which a certain loss amount may be exceeded); and risk scenarios for selected infrastructure for a predetermined event, weighted by loss magnitude and occurrence probability.

2. Formalize a process for declaring and financing natural disasters

**The scope of government contingent liabilities related to natural disasters has implications for post-disaster relief, recovery, and reconstruction spending.** Defining ex-ante when, where, and for what damages the government will provide financial support is an effective way to manage and reduce the explicit contingent liabilities of the government.

**A formal process for declaring a disaster can help clarify after which events central government funding is available.** In many countries, central governments are legally required to bear financial responsibility of disaster-related damages on public assets, yet it is not cost-efficient for central governments to provide post-disaster funding support for all types of adverse events. Governments may limit their explicit contingent liabilities by formalizing a process to issue a declaration of disaster for events above a certain severity level, and providing resources only in the aftermath of a declared disaster. A formal process as such also minimizes discretionary decisions for spending and provides certainty to sectoral agencies and local governments on the procedures for requesting financial support from the central government.
Clarifying the types of assets, both public and private, under government financial responsibility also helps limit the explicit contingent liabilities of the government and reduce the post-disaster spending needs. It sends a clear signal which losses will not be eligible for financial support, encouraging those bearing the risk to take precautionary measures to mitigate or transfer the risk to third parties through insurance coverage.

The following is a (non-exhaustive) list of assets to be considered:

- Public assets: roads, bridges, public schools, hospitals, hydraulic, electric and urban infrastructure, etc.
- Private assets: (i) houses of low-income population; and (ii) small businesses.
- Agricultural sector: crops and livestock. Governments should have pre-determined criteria regarding which farmers should be able to receive support (e.g., depending on farmer’s annual income, amount of planting acres, number of cattle, region) and the amount of support depending on type of crop, livestock, etc.
- Recovery programs: social and economic support programs (e.g., concessional loans, healthcare subsidies, educational subsidies), debt relief programs for small businesses, etc.
- Other supports: (i) household items (e.g., fridge, stove, bed, furniture); (ii) aid supplies to the affected population (e.g., food, water, shelter, blankets, mattresses, medicines); (iii) vector control against epidemic outbreaks.

In Mexico, the Civil Protection Law articulates a formal definition of what constitutes a natural disaster. The Operating Rules of FONDEN identify a list of natural hazards that could potentially trigger FONDEN funding support. If technical agencies find that an adverse natural event surpasses the threshold severity level, measured according to predefined scientific parameters, the GoM issues a declaration of natural disaster. This declaration allows affected sectoral agencies to submit requests for FONDEN resources. However, if the event is not declared a natural disaster, affected government entities cannot request FONDEN resources and must address the damages through their own budgets. The Operating Rules of FONDEN specifically state that resources are used only for emergency assistance to affected populations; the reconstruction of uninsured or underinsured public infrastructure (federal and local); the restoration of certain components of the natural environment; and the reconstruction and rehabilitation of low-income housing.

3. Clarify post-disaster financial responsibilities of the central and local governments

Clear rules on cost-sharing between the central and local governments can help increase the efficiency of government financial support towards post-disaster recovery and reconstruction activities. It is important to consider the political economy dimension of disaster risk financing; local governments should bear part of the losses, balanced with their financial capacities, in order to have the right incentives to invest in risk reduction and prevention measures and to purchase appropriate insurance coverage. Should the central government shoulder 100 percent of total post-disaster recovery and reconstruction costs, local authorities could have a strong incentive to continuously request resources for local assets, even with frequent small-scale events. In addition to sharing financial responsibilities, the central government may also promote programs to build local government’s capacity for ex-ante financial management of disasters to reduce its explicit liabilities.

Most decisions impacting physical and financial exposure to natural disasters are made at the local level; encouraging local governments to take financial ownership of their exposure can help reduce their disaster losses. The contribution of local governments may differ by sector, type of asset, type and severity of disaster, and the budget constraints of the local government. In Mexico, FONDEN finances 50 percent of the recovery and reconstruction cost for eligible uninsured local assets the first time it is damaged by a natural disaster (the remaining 50 percent is financed by the local government). The second time the same uninsured asset is damaged only 25 percent will be financed by FONDEN, and thereafter the

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1 Governments may want to determine eligibility criteria for private assets. While in practice low-income housing is generally covered by the government, not all governments are willing to take it on as explicit liability, and the definition of what qualifies as "low-income" can be politically sensitive.
2 Government should promote private insurance for households who can afford to purchase insurance. Government funds would then be used to support the affected low-income households.
3 This could be particularly useful in lower-income, more centralized countries, where many local governments have extremely limited capacity to fund disasters.
uninsured assets are rendered ineligible for FONDEN support after a new disaster. In contrast, insured assets are eligible for FONDEN funding (covering 100 percent of costs for federal assets and 50 percent for local assets) irrespective of the number of times the assets have received FONDEN support in the past. This cost-sharing arrangement also encourages local governments to transfer risk to insurance companies by purchasing insurance coverage for local assets.

4. Mobilize resources ex-ante through a DRM fund and DRFI strategy

A dedicated DRM fund forms the crux of the government’s ability to manage the financial impact of natural disaster risk. It provides the government with a pre-defined amount of readily available resources to be used in the aftermath of a natural disaster. While this is just one of the six steps to establish an overarching institutional mechanism, creating a DRM fund could be one of the most important achievements. It requires discussion and agreement with the Ministry of Finance and, in many cases, with the Legislative branch.

Allowing the DRM fund to allocate resources across multiple years increases its risk retention and post-disaster response capacity. The DRM fund should be allowed to accumulate unused resources independent of the annual budget allocation. Remaining resources at the end of each fiscal year can go into the DRM fund’s reserves to be used in peak years with costly events, thereby helping to smooth out public finances. The government can choose to legally specify a fixed amount for the DRM fund to avoid yearly negotiations on the budget allocation, which may be subject to the fiscal position of the government. For instance, the Mexican Federal Budget Law requires that no less than 0.4 percent (approximately US$800 million) of the total yearly Federal Budget Expenditure must be allocated to FONDEN.

The DRM fund can also serve as the first building block towards developing a more comprehensive DRFI strategy. Governments can leverage the DRM fund to take out contingent credit for intermediate risk layers, and access the (re)insurance and capital markets through insurance and/or capital market instruments to transfer the higher layers of risk. In some cases, the DRM fund might need to be legally empowered to purchase market-based financial instruments. Also, explicit legal measures against diverting resources from the DRM fund to priority development programs (e.g., health or education) can preempt policy makers from giving in to social and political pressure and foster the opportunity to grow the government’s capacity against natural disasters.

5. Allocate resources based on damage and loss assessment methodology

Clear rules on damage assessment and resource allocation help maintain fiduciary control and hold the fund recipients accountable. In the aftermath of a natural disaster, a damage assessment procedure can support the allocation of resources based on actual damages incurred in what is an inherently political process. A Damage Assessment Committee (DAC) is good practice to streamline the responsibility of assessing the damage, determining the extent of losses, and quantifying funding needs. The findings of the DAC inform the amount of resources to allocate to specific recovery and reconstruction activities and provide transparency on the use of funds.

The DAC should take into account all sectors that have been affected by the disaster and can be further divided into different subcommittees for each affected sector (e.g., housing, roads and bridges, hydraulic infrastructure, education, health). A good practice to ensure the time-efficient allocation and disbursement of funds is to set a number of days for the subcommittees to complete all damage and loss assessments. In Mexico, the Operating Rules of FONDEN allow a maximum of twenty working days for subcommittees to carry out all damage and loss assessments (e.g., complete site visits, document and photograph the types of damages with GPS-integrated devices, itemize recovery and reconstruction needs and related costs). Based on the assessment results, resources from FONDEN are allocated for specific activities and never for the recipient entity to spend at their discretion.

6. Execute resources and coordinate efforts across the post-disaster recovery and reconstruction process

A specialized coordination unit keeps track of all allocated funds and associated recovery and reconstruction activities. It manages the efforts between the central and local governments as well as the private sector. The coordination unit may be within the Ministry of Interior, the Ministry of Finance, directly assigned to the Executive Office of the President, or in any government body related to post-disaster reconstruction.
The coordination unit can also manage the DRM fund, periodically revising the operating rules of the DRM fund to improve the management and operation of its resources. In Mexico, the General Directorate of FONDEN functions as the specialized coordination unit and manages all funding channels and its procedures related to resource mobilization, allocation, and execution. In the aftermath of a natural disaster, the General Directorate of FONDEN reviews the funding requests from federal agencies and local governments, examines the assessment results of the DAC, allocates resources, and executes resources for each recovery or reconstruction activity. The General Directorate of FONDEN also revises the Operating Rules of the different financial instruments utilized in the risk reduction, emergency response, recovery, and reconstruction phases of Mexico’s disaster risk management program (Figure 3).

**Figure 3. Role of FONDEN’s Instruments in Mexico’s National System of Civil Protection**

Transparency and accountability should be a priority in resource execution, and governments should ensure that activities are carefully monitored and publicly reported. For example, transferring resources from the DRM fund directly into the accounts of the service providers or contractors can reduce redundant and inefficient steps in the funding chain, such as transferring resources first to government agencies or local governments for further disbursement to contractors and service suppliers. Governments can also require regular submissions of progress reports from contractors and service suppliers implementing the activities.

In Mexico, for example, service suppliers must submit financial statements and documented quarterly reports on physical and financial progress to the General Directorate of FONDEN in the approved FONDEN template. In addition, real-time information on FONDEN allocations for post-disaster recovery and reconstruction categorized per disaster and sector is publicly disclosed through the National Civil Protection’s website.

**Looking Forward**

The above-mentioned six steps aim to provide policy makers with an operational framework to develop an institutional mechanism for financing post-disaster recovery and reconstruction operations. The Ministry of Finance may be able to mobilize resources but may be hesitant to disburse them in the absence of a procedure to systematically allocate and transparently execute the resources. Efforts to make resources available through DRFI strategies can be rendered fruitless and lead to delays in recovery and reconstruction operations in the absence of systems that ensure effective response at every step of the resource mobilization, allocation, and execution chain.

Such an institutional mechanism can help increase the financial resilience of the country against natural disasters. A small-scale pilot that may have only a few of the components of the six aforementioned steps can be a useful starting point from which a more comprehensive system can be developed. Over time, policy makers can build on the country’s experience to continually improve the institutional mechanism. The mechanism should also evolve as an integrated component of the government’s comprehensive disaster risk management strategy, gradually expanding to provide
financial support for programs that promote proactive disaster risk prevention. Governments seeking to increase their financial resilience to disasters and promote proactive disaster risk management may find it useful to apply lessons learned from Mexico’s experience through FONDEN to their own context.

References

DRFI Program website: worldbank.org/fpd/drfi

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