Prosperity Insight Series

CONCEPTUALIZING DISASTER RISK–BASED BUDGETING AND EXPLORING PRACTICAL APPLICATIONS

October 2024

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Stephanie Allan, Eleanor Bayley

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Acknowledgements

This report was prepared by a team led by Tatiana Skalon (Senior Financial Sector Specialist) and Richard Anthony Sutherland (Senior Public Sector Specialist) and comprising Stephanie Allan (Senior Public Financial Management [PFM] Consultant) and Eleanor Bayley (Governance Consultant). The team is part of the World Bank Prosperity Vertical, which includes the Disaster Risk Financing and Insurance Program in the Finance, Competitiveness and Innovation Global Practice and the Governance Global Practice. The report was edited by Anne Himmelfarb.

The team wishes to express appreciation for the valuable comments received from peer reviewers: Martin Melecky, Lead Economist, Bernard Myers, Senior Public Sector Specialist and Margaux Lucrece Lelong, Governance Specialist. This report greatly benefitted from guidance from Olivier Mahul, Emiko Todoroki, Serdar Yilmaz, Practice Managers, Aart C. Kraay, Chief Economist, and Jean Pesme, Global Director.

The team gratefully acknowledges the knowledge, time, and other invaluable contributions offered by the following during interviews: Richard Davis (Senior Research and Evaluation Manager, National Audit Office, UK), James Ebdon (Deputy Chief of Staff, Office for Budget Responsibility, UK), Rachel Fenn (Senior Analyst, National Audit Office, UK), Greg Fowler (Senior PFM Consultant, World Bank), Sarah Houston-Eastergaard (Treasurer, Treasury and Insurance team, Wellington City Council), Jo Kemp (Senior PFM Consultant, World Bank), Kristen MacAskill (Associate Professor in Engineering, Environment and Sustainable Development, University of Cambridge), James Picker (Clerk Assistant, House of Representatives, New Zealand), Andie Thomson (Senior Advisor Insurance, Treasury, Wellington City Council), Alberto Vanzo (Senior Auditor, National Audit Office, UK), and Ken Warren (Chief Accounting Advisor, Treasury, New Zealand). The team is grateful for inputs from Evie Calcutt (Senior Financial Sector Specialist), Raquel Letelier (Senior Financial Sector Specialist), and Jo Kemp (Senior PFM Consultant). Preparation of this reported was enabled with financial support from the Risk Finance Umbrella of the World Bank, which is supported by the UK Foreign, Commonwealth & Development Office (FCDO), the Swiss State Secretariat for Economic Affairs (SECO), and the United States Agency for International Development (USAID).

Abbreviations

COVID-19	Coronavirus disease
CPIER	Climate Policy and Institutional Expenditure Review
DBM	Department of Budget and Management (Philippines)
DRBB	Disaster Risk–Based Budgeting
DRF	Disaster Risk Finance
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DRR-PFM	Disaster Resilient and Responsive Public Financial Management
EU	European Union
FY	Fiscal Year
GDP	Gross Domestic Product
IFMIS	Integrated Financial Management Information System
ISSAI	International Standard for Supreme Audit Institutions
IT	Information Technology
LGD	Lead Government Department ((UK)
MHCP	Ministry of Finance and Public Credit (Colombia)
MTFF	Medium-Term Fiscal Framework
NAO	National Audit Office (UK)
NDRRM	National Disaster Risk Reduction and Management (Philippines)
OBR	Office of Budget Responsibility (UK)
OECD	Organisation for Economic Co-operation and Development
PAC	Public Accounts Committee
PEFA	Public Expenditure and Financial Accountability
PER	Public Expenditure Review
PFM	Public Financial Management
SAI	Supreme Audit Institution
VFM	Value for Money

EXECUTIVE SUMMARY

This report explores how countries can embed disaster risk in their budgets[1]—an especially important task as climate change gives rise to greater disaster impacts and as economies and populations grow. This topic is a response to growing recognition that effective disaster risk finance (DRF)[2] solutions must be formulated and managed as part of government day-to-day activities rather than occasional investments. This report combines experience from the Finance, Competitiveness and Innovation Global Practice and the Governance Global Practice at the World Bank to look at the interaction between public financial management (PFM) and DRF.

Disasters have historically been seen as unexpected events that require extraordinary responses. While this view is changing, and the use of DRF instruments (such as insurance, contingent credit, and reserves) has increased over time, governments still retain a significant portion of the risks they face and meet much of the cost of disasters through the public budget. This is true in countries where access to disaster insurance is more limited (for example, in contexts where the risk is not diversifiable within national borders and there is little risk sharing); but it is also true in countries where insurance is readily

1. Disaster risk refers to "the potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity" (UNDRR, n.d.). The scope of this review is general government (primarily central), with a focus on expenditure measures in particular.
2. Disaster risk finance refers to a system of financial mechanisms that helps countries prepare for disasters, respond to disasters, and reduce the risk of disasters occurring.

available. In 2023, disaster losses worldwide covered by insurance represented 31 percent of total economic losses; in most emerging markets and developing economies, the figure was less than 10 percent (Aon 2024). The reactive approach to disasters can have serious macroeconomic and fiscal impacts, which often stretch into the medium and long term due to the scale of costs as well as inefficiencies and delays.

Although disasters represent significant costs to governments, made worse by climate change and the growing exposure of people and their assets to disasters, PFM systems are rarely configured to proactively address the risks posed by disasters. This includes failing to adequately invest in disaster risk reduction and disaster preparation as part of the regular budget cycle or arrange financing to meet disaster response and reconstruction needs. Furthermore, DRF solutions are not always sustained, leaving governments unduly exposed to significant fiscal risks and leaving people and their assets insufficiently protected.

There are a number of reasons why PFM systems often fail to systematically plan for and prioritize disaster risk in routine budgeting processes. In some cases, there is a perception of disasters as unpredictable "acts of God" that cannot be prepared for. Governments inherently prefer to allocate scarce resources to known or confirmed expenditures rather than to more uncertain contingent liabilities; they fear that spending on the latter would be wasted should the liability not materialize. This preference is particularly apparent in resource-constrained environments where there are unmet needs in sectors like health and education. Moreover, modeling of disaster risk and design of DRF instruments require expertise that may not be found in all central finance agencies, while the need to collaborate across government presents institutional coordination challenges. Another reason why routine budgeting often fails to take disaster risk into account is that ex post sources of funding are often easier to access: for example, budget reallocations are directly within government control.[3] Lastly, governments may receive considerable credit for disaster response measures, such as repairing or reconstructing public assets or providing extraordinary support to businesses or households, and this dynamic can be a disincentive to pursuing political capital from preparedness, risk reduction, or DRF (whose returns may not materialize until later in the election cycle). Disasters also lead to a general relaxation of standards, due to growing pressure to spend quickly, inadequate contingency planning, and disruptions to business processes.

Disaster risk–based budgeting (DRBB) is a response to these binding constraints and can be defined as "the consideration of disaster risk throughout the government budget cycle." DRBB aims to improve the way governments prepare for and manage the fiscal implications of natural disasters. There is no universally applicable approach, but this review provides some guidance on how governments might tackle some of the most pertinent concerns around public finance for disasters, including how much of the budget to put aside for a disaster; how to balance investment in risk reduction with investment in disaster response; and how to balance the need to accelerate emergency spending with accountability demands.

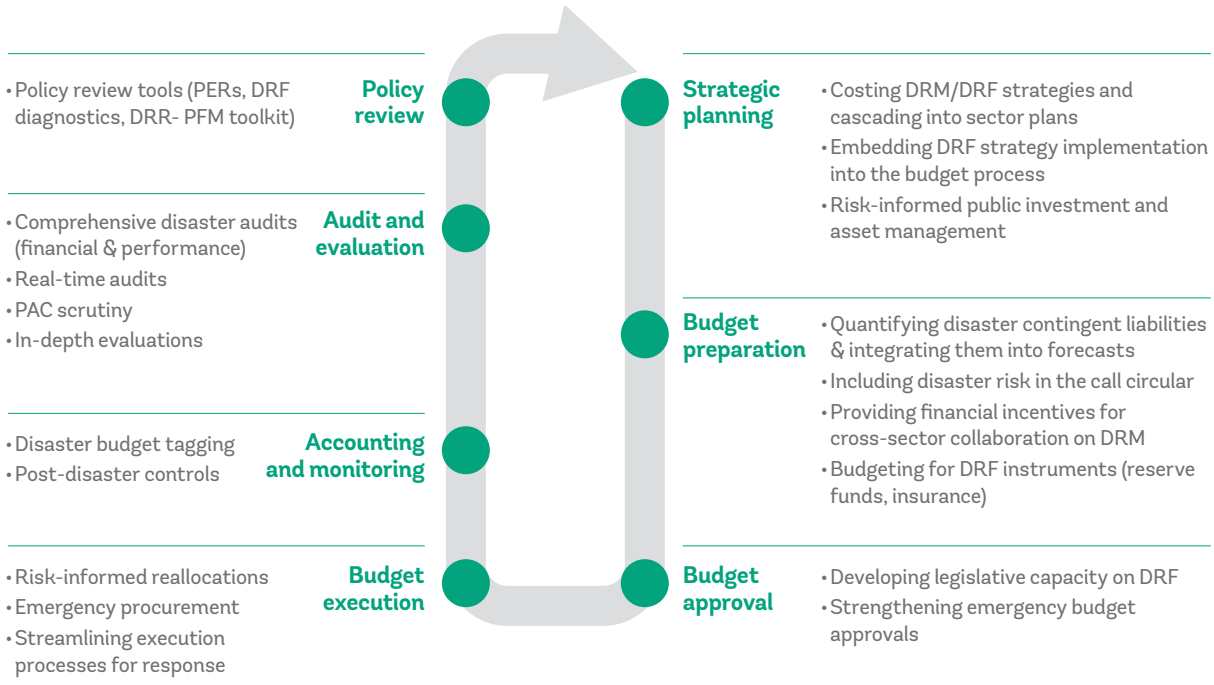
Embedding disaster risk considerations into budgets is crucial for achieving the world's ambitions in adapting to changing climate. Understanding the fiscal impacts of climate-induced disasters (on revenue, expenditure, and debt) helps stakeholders plan, allocate, and use finance more effectively. For example, several governments are making strategic use of various DRF instruments to prepare in advance for disaster events; this

3. For example, see a World Bank (2021a) study of COVID-19-related budget reallocations.

approach makes post-disaster response and recovery more costefficient and frees resources for other priorities. Importantly, ensuring that disaster risk is part of government's day-to-day PFM will make disaster risk finance and management more sustainable and targeted.

Depending on the underlying cause of their continued financial vulnerability to disasters, governments can integrate disaster risk at each or any stage of the budget cycle—from strategic planning and budget preparation to execution, accounting, and audit, as shown in figure ES 1.

Figure ES 1: Entry points for the consideration of disaster risk in the budget cycle



Source: World Bank.
Note: DRF = disaster risk finance; DRM = disaster risk management; PAC = public accounts committee.

Many governments, facing the reality of growing disaster risks, have adopted elements of the DRBB approach. Some countries have set up reserve funds, which they fund through annual appropriations. Others have incorporated disasters into their fiscal risk monitoring. Still others have introduced post-disaster expenditure controls and budget tracking systems to monitor spending for emergencies. This report takes natural disasters (including pandemics) as a starting point[4] and draws on some of this global experience to inform the discussion of DRBB approaches. It looks at

4. The scope of this report does not cover financial crises, food and energy crises, or conflict.

upstream PFM processes (concerned in large part with the adequacy of financing for disasters) and downstream PFM processes (concerned with how effectively those funds are executed), both of which are important to reducing the impact of disasters.

Some lessons are emerging about the importance of an adequate institutional structure for implementing DRBB. While different countries have adopted different models, central finance agencies—which may include ministries of finance, fiscal councils, and debt management offices, among others—clearly have a leading role to play in ensuring that the design and delivery of DRF is comprehensive, consistent, and coordinated across government, and in designing PFM systems needed to ensure sustained fiscal safeguards.

DRBB is not intended to be a tick box exercise and will not be the same for all countries. Appropriate entry points for DRBB should be guided by the individual country's risk profile as well as the binding constraints the country faces. Given the ever-evolving nature of disasters and fiscal risks, governments need to enable a learning environment where robust evidence informs planning and budgeting processes that strengthen resilience. Critically, much of this work (and research) should be done ex ante, i.e., in advance of the next disaster, although lessons from the public financial response to historical disasters should also be taken into account. A practical way to adopt DRBB could be by developing a framework that is reviewed and updated every year.

This report contributes to knowledge about a growing concern in public financial management: how to ensure financial resilience in the face of more frequent and severe disasters. However, it provides only an overview of the key concepts of DRBB and summarizes the array of entry points, without going into specific detail on any. Some areas would benefit from further research and elaboration, as detailed in this paper.

1 C

INTRODUCTION

1.1. The need for disaster risk–based budgeting

Disasters are a growing source of macroeconomic and fiscal instability. From the perspective of central finance agencies, disasters manifest as macroeconomic and fiscal shocks that cause parallel impacts on economic growth, public expenditure, public sector asset values, revenues, and other economic fundamentals. These impacts became widely evident during the COVID-19 pandemic,

which saw both an unprecedented surge in public spending (as governments extended support to households and businesses) and sharp declines in output growth. The result was a 28 percentage point jump in total public plus nonfinancial private debt in a single year (2020), with more than half of this surge occurring on public balance sheets (IMF 2022). Disasters can also derail progress on poverty reduction, as happened after the 2022 floods in Pakistan and after Typhoon Yolanda in the Philippines (see box 1).

Climate change makes extreme weather events more frequent and more severe. The Marsh McLennan Flood Risk Index estimates that the current share of urban areas, rural areas, and infrastructure at risk of flooding would double in a 2°C warming scenario (Marsh McLennan 2021). Recognizing some variations in modeling as well as regional differences, the Intergovernmental Panel on Climate Change points to increased risk of drought and increased frequency, intensity, and/or amount of heavy precipitation associated with tropical cyclones as impacts of climate change (IPCC 2018).[5]

Against this backdrop, investments in disaster risk management (DRM) and disaster risk finance (DRF) are increasingly critical. DRF has been highlighted as critical by many international forums, including the UN Climate Change Conference (COP29), G7, G20, and Asia-Pacific Economic Cooperation (APEC). Within the World Bank, DRF is a part of the Evolution Roadmap, and the World Bank Group Scorecard includes several relevant indicators. The World Bank offers a growing number of products to help countries better deal with disaster shocks, such as the Crisis Preparedness and Response Toolkit (World Bank 2024); and traditional lending is focusing on climate adaptation more often than in the past. Integrating these strategies within public financial management (PFM) frameworks ensures that countries are better prepared to absorb and respond to financial shocks, thereby enhancing fiscal resilience and sustainable development.

Box 1: The macro-fiscal consequences of the 2022 Pakistan floods and 2013 typhoon in the Philippines

Pakistan floods

In mid-2022, Pakistan was hit by flooding that submerged a third of the country's land mass, displacing 8 million people and affecting 33 million people in total. Vulnerable groups, including women, children, people with disabilities, and refugees, were disproportionally affected. The Post-Disaster Needs Assessment carried out by the government and partners estimated total damage in the region at US$14.9 billion, predominantly due to destroyed/damaged assets in the housing, agriculture, and transport and communications sectors. Total economic losses amounted to 4.8 percent of gross domestic product (GDP) (Government of Pakistan et al. 2022). The recovery and reconstruction needs were projected at 1.6 times the budgeted national capital expenditure for FY2022/23. In response to the disaster, the federal government's relief program was valued at Rs 60 billion, including a 25 percent increase in payments through the county's social protection program, the Benazir Income Support Programme (BISP). Other expenditures (at federal and provincial levels) included search and rescue, the distribution of emergency supplies, an emergency health program, and livelihood assistance grants for smallholder farmers. (Division of Finance, Government of Pakistan 2023)

5. There is moderate to high confidence in these projections.

The flood exacerbated the impacts of other domestic and external economic shocks, with Pakistan's economy contracting by an estimated 0.6 percent in FY2022/23. With flood impacts disrupting supply chains, amid rapid currency depreciation, increasing global prices, and energy price increases, headline inflation rose to a decade high of 29.2 percent, while the fiscal deficit remained stubbornly high at 7.8 percent of GDP. Despite the government's efforts, poverty is estimated to have risen by five percentage points, to 39.4 percent (US$3.65/day 2017 PPP) in FY2022/23, reflecting an increase in the number of poor Pakistanis of 12.5 million relative to the year prior (World Bank 2023a).

Typhoon Haiyan in the Philippines

Typhoon Haiyan (Yolanda) made landfall in the Philippines in November 2013, causing 6,300 fatalities and pushing 2.3 million people below the poverty line. A fifth (20 percent) of the Philippine population lived in affected areas, significant numbers of whom were identified as poor and vulnerable. The typhoon affected 16 million people and damaged or destroyed 1.14 million structures. In the first three months following the disaster, the Department for Social Welfare and Development distributed US$12.5 million in unconditional grants under its 4Ps (Pantawid Pamilyang Pilipino Program) social protection program; other relief efforts focused on temporary shelters, family food packs, and reconstruction of roads and transport (Athawes 2018; Bowen 2016).

The total loss and damage was estimated at US$12.9 billion. The impact on economic growth was calculated as a contraction of 0.9 percent in 2013 and a further 0.3 percent in 2014. Inflation increased in the immediate aftermath of the typhoon, reaching 4.1 percent in December 2013. This rise was driven in part by increased prices for liquified petroleum gas, which had jumped by 18.5 percent by January 2014 (World Bank 2017).

Source: Division of Finance, Government of Pakistan 2023; Government of Pakistan et al. 2022; Bowen 2016; World Bank 2017; World Bank 2023; Athawes 2018.
Note: PPP = purchasing power parity.

Given that a central objective of PFM is to maintain aggregate fiscal discipline and that the potential impact of disasters on macroeconomic and fiscal stability is significant, central finance agencies in vulnerable countries ought to treat disaster risk as a core concern. This is widely recognized in the PFM literature. For instance, the International Monetary Fund (IMF) proposes a three-tier classification for risk disclosure and analysis and encourages regular monitoring and discussion of specific fiscal risks such as disasters (IMF 2018). The Organisation for Economic Co-operation and Development (OECD) also provides recommendations and principles for fiscal risk assessments; principle 9, on budgetary governance, requires fiscal risks to be identified and reported in budgetary documents and appropriately managed (OECD 2014). Meanwhile, the Public Expenditure and Financial Accountability (PEFA) Secretariat selected "crisis budgeting," which looks at how PFM systems can respond to disasters and other emergencies, as the theme for its 2022 global report on PFM (PEFA Secretariat 2022).

However, central finance agencies seeking to be proactive about disasters confront multiple constraints. For example, budgeting processes tend to prioritize spending where execution is known and predictable, while disaster expenditures by their nature are largely uncertain contingent liabilities. This tendency is particularly pronounced in resource-constrained environments, where it can be difficult to justify putting aside funds in reserve when there are unmet needs in critical sectors like

health and education. Moreover, central finance agencies may lack the data to underpin informed ex ante action, or may lack the in-house experts needed to arrange and deliver DRF solutions (such as actuaries or financial market specialists). It is also the case that as a cross-cutting area, disaster resilience demands a response that spans multiple sectors and government agencies, and thus poses institutional coordination challenges. Political incentives may also work against proactive disaster financial planning and risk reduction; elected members may experience increased political popularity for their response to disaster shocks, but may have little incentive to undertake disaster planning that extends beyond electoral cycles. For all these and many other reasons, the management and financing of disaster risk are often not part of day-to-day central finance agency functions.

A complex landscape of DRF instruments has emerged to help countries build financial resilience to disasters, but these solutions are not always sustained or used to their full capacity. Many instruments—including disaster reserve funds that provide rapid liquidity, contingent credit that pays out upon a predefined trigger, and insurance and debt market instruments that transfer a portion of the risk to external risk holders in return for a fee—are now available from a wide range of development partners and financial institutions (see box 2). But DRF instruments are often underutilized (for example, they provide insufficient coverage), or they are introduced but not sustained (for example, insurance policies are not renewed and reserve funds not replenished). Such lapses are particularly likely when elected officials or other decision-makers change, when

Box 2: Sample DRF instruments available to governments

Governments generally address risk by transferring some of it (so another party pays to meet the costs of the disaster, usually for a fee) and retaining some the rest. For the portion of risk that they wish to transfer, governments may use the following instruments:

- Insurance (indemnity or parametric) for governments, households, farmers; microinsurance
- Market-based instruments (e.g., catastrophe bond, catastrophe swap)
- Humanitarian aid

For the portion of risk that they retain, governments may use the following instruments:

- General contingency reserves
- Dedicated disaster reserve funds
- Contingent credit (e.g., catastrophe deferred draw down options)
- Post-disaster borrowing (external and domestic)
- Budget reallocations

Source: World Bank 2014a.

instruments do not pay out for a number of years in a row[6], or when instruments do pay out and are expected to become more expensive (as can be the case with insurance). In such cases, when a disaster hits, governments will often step in as the insurer of last resort, with the ensuing fiscal pressures described at the start of this section. A lack of financial planning for disasters can undermine the adequacy, timeliness, and efficiency of response and reconstruction efforts, ultimately augmenting disaster impacts.[7]

Disaster risk–based budgeting (DRBB) is a response to the tendency of PFM systems not to pay adequate attention to disaster risk, and the tendency of governments not to embed DRF instruments in PFM systems. DRBB encourages efforts to embed resilience across the government budget cycle, focusing on general government expenditure measures that reduce disaster risk and measures that respond to it (such as expenditures on disaster response and reconstruction). It also encompasses efforts to increase the frequency and regularity with which DRF instruments are reviewed and redesigned or renewed, in line with the budget cycle.

This report provides some policy recommendations for the implementation of DRBB, drawing on experience from a variety of countries across income classifications. It is intended as a foundational document to build understanding of the relationship between disaster risk and the budget cycle, and it considers a wide range of challenges and elements of public financial management. It also aims to be of practical use for central finance agencies looking to improve the way they prepare for and manage disaster risks, and it responds to common questions they may ask—for example, how much of the budget to put aside for a disaster; how to balance investment in risk reduction with investment in disaster response; and how to balance the need to accelerate emergency spending with accountability demands. Building on some emerging lessons learned, the report also provides practical recommendations on how DRBB reforms can be implemented.

The report is structured as follows: the remainder of section 1 provides the definition of DRBB and discusses some of the binding constraints that it seeks to address; section 2 discusses a number of different DRBB entry points around the budget cycle and provides illustrative country case studies; section 3 offers guidance for governing DRBB; and section 4 provides recommendations and plans for further, more in-depth, study.

1.2. Binding constraints on the management of public finances for disaster risk purposes

DRBB tries to address two challenges. The first challenge is that PFM systems do not pay adequate attention to disaster risk, despite the potential negative impacts of disasters on public finances. Spending decisions are made without due attention to how decisions might affect the risk of disasters, and without sufficient financial planning for different disaster scenarios. The global shortfall in expenditures on disaster risk reduction (DRR) and climate adaptation, despite their well-

6. See for example the independent evaluation of the African Risk Capacity regional risk pool, which found that staffing changes, election cycles, and past payouts all impact policy renewals. The evaluation notes constant pressure within domestic budgets to reduce premium amounts and therefore coverage (OPM 2022).

7. An examination of the impact of the FONDEN disaster fund in Mexico found that when disaster costs were covered by transfers from the fund, local economic recovery was accelerated by up to two years (del Valle, de Janvry, and Sadoulet 2020).

documented benefits in terms of lives saved and losses avoided, is one consequence of this failure.[8] This issue is particularly acute in low-income contexts: disaster impacts on the economies of least-developed countries measured as a share of gross domestic product (GDP) are around 10 times worse than impacts on the economies of the richest countries; and yet less than two-thirds of least-developed countries have DRR strategies, and less than half report having early warning systems (UNDRR 2022). Moreover, practices during the COVID-19 pandemic—such as widespread reliance on multiple supplementary budgets and efforts to fast-track the procurement of emergency supplies while also avoiding fraud—are evidence of limited financial planning for emergencies.[9]

The second challenge is that DRF instruments are often underutilized or not always sustained because the decision-making around them is not sufficiently embedded in budgeting processes. There are multiple examples of governments that have decided not to renew disaster insurance because it did not pay out for a number of years in a row, without regard to future risk projections.[10] Similarly, there are multiple examples of governments underfunding disaster funds, even though these are routinely exhausted early in the fiscal year.[11]

Several binding constraints lead to this dual challenge. While these will vary depending on context, some of the most prominent or reoccurring constraints include the following:

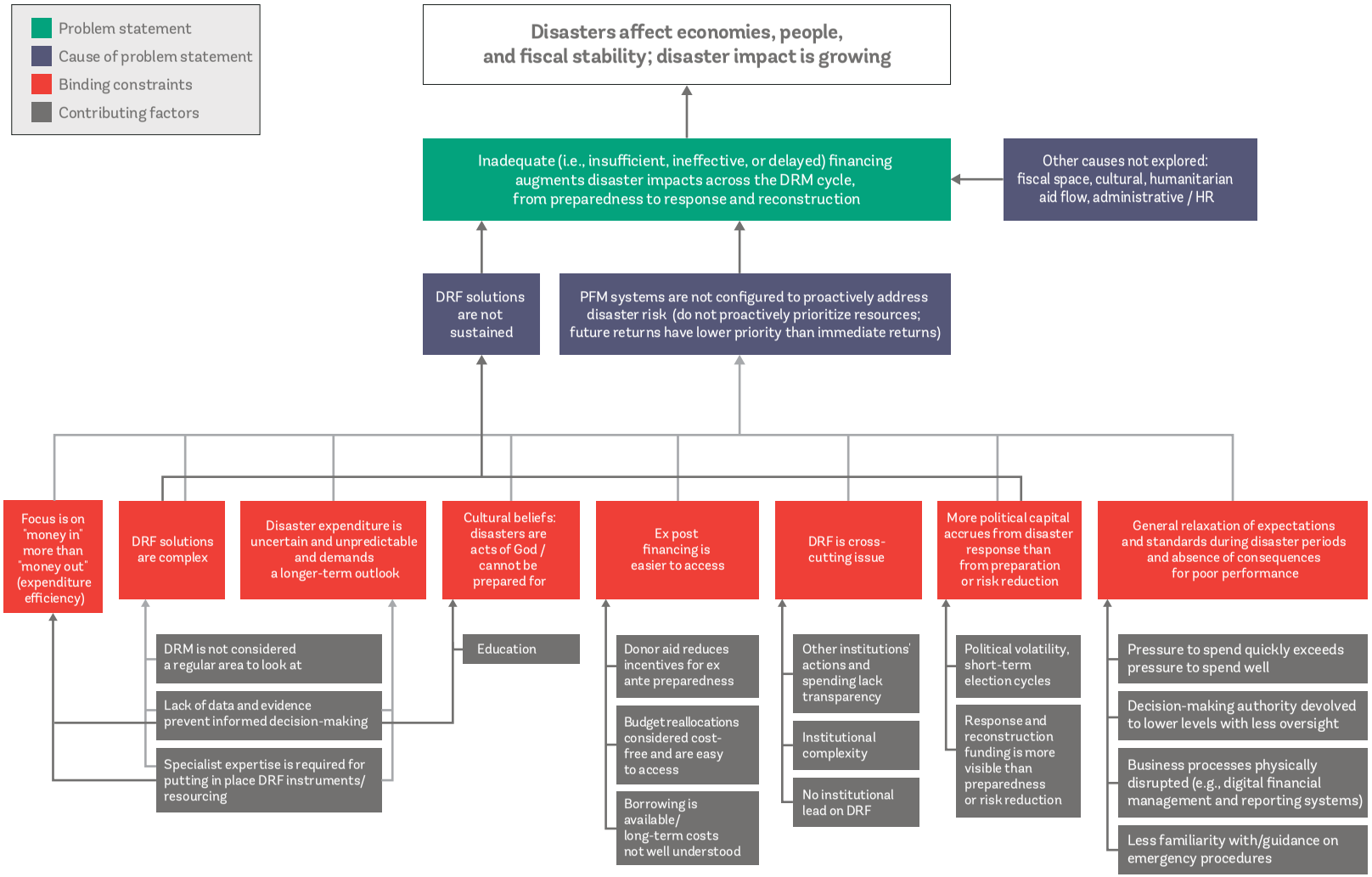
- The perception that disasters are "acts of God"—that is, they are unpredictable, and cannot meaningfully be prepared for. This view shifts political emphasis from preparation to coping mechanisms, in turn minimizing opportunities to more comprehensively prepare for and mitigate the fiscal impacts of disasters.
- Related to this, an inherent preference in budgeting systems to allocate scarce resources toward known and confirmed expenditures over contingent liabilities (because if contingencies do not materialize, the funds could be deemed wasted). This issue is particularly acute in economies with limited fiscal space.
- The perceived (and often real) complexity of modeling risk and designing DRF solutions, which may require specialist expertise (for example, in actuarial modeling or financial markets) not necessarily found in all central finance agencies. This complexity is in contrast to the comparative ease of access to post-disaster borrowing (at least for economies at low or moderate risk of debt distress[12]) or budget reallocations.[13]
- The political visibility and publicity gained from public acts of disaster response—such as the (re)construction of tangible public assets—as opposed to preparedness or risk reduction (Clarke and Dercon 2016), which can reduce incentives to spend on early action or financial preparedness.
- The lowering of budget implementation and monitoring standards during disaster response periods, which may occur given the urgency of the situation and the focus on spending more, and more quickly.

8. See for example International Science Council (2023); UNEP (2023).
9. See for example CABRI (2021a, 2021b).
10. See for example the case of Kenya and African Risk Capacity insurance (OPM 2022).
11. One relevant example is offered by the Philippine Quick Response Fund, which was designed to meet immediate disaster response costs but which was exhausted and replenished every year covered in a recent Public Expenditure Review (World Bank 2020). Another example is provided by the Government of Ethiopia's contingency budget, which is used for disasters and other unplanned expenditures, and is routinely exhausted in the second quarter of the financial year (Ministry of Finance 2023).
12. Fisera, Horvath, and Melecky (2023) show that disasters increase the cost of debt financing for middle- and low-income countries, but decrease the cost for high-income countries. The disparities between countries will be further explored in subsequent papers.
13. See an example of COVID-19-related budget reallocations in World Bank (2021a).

- The focus of efforts to strengthen ex ante DRF on the provision of adequate disaster funding, with less emphasis on how those funds will be executed; and inefficiencies in downstream PFM more broadly.
- Political volatility, or short election cycles, which may reduce the focus on efforts to promote longer-term resilience.
- The fact that the management of disaster risks and arrangement of DRF does not fall under a single institution but is rather a cross-sectoral responsibility. This creates challenges associated with interagency and intra-agency coordination, financial tracking, monitoring, and accountability.

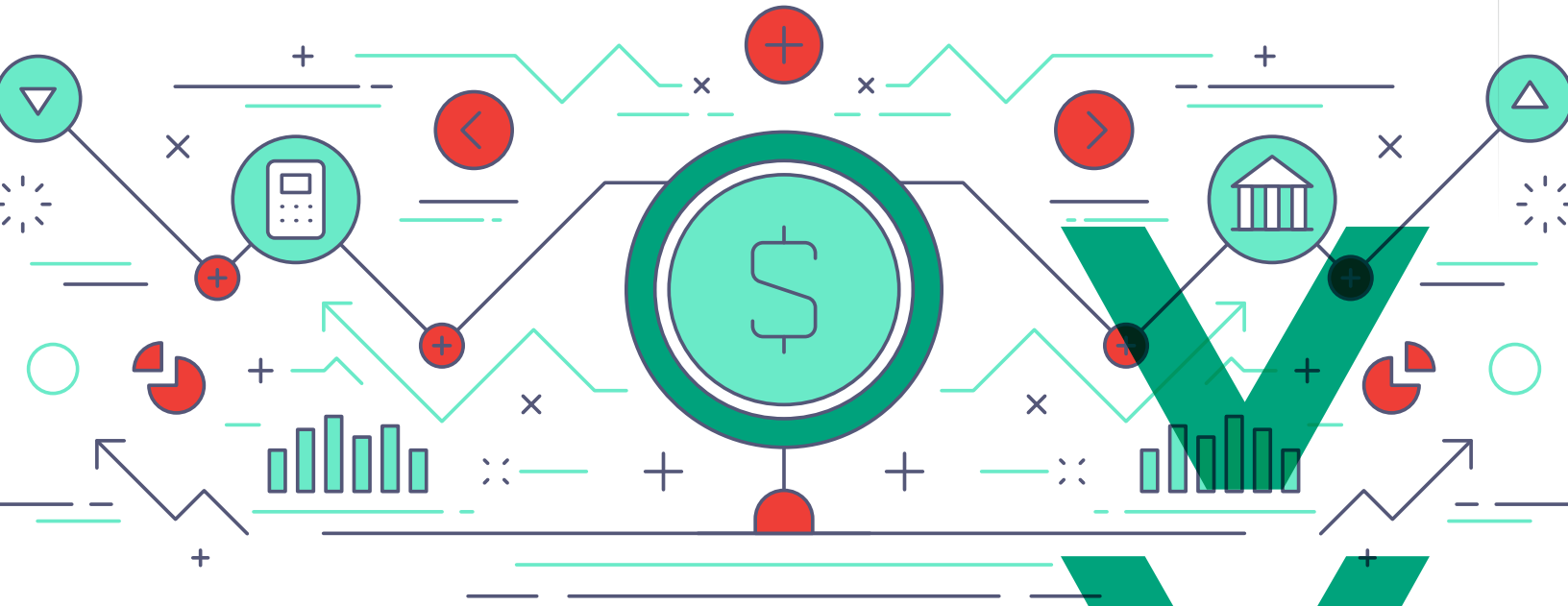
Figure 1 further details some of the factors contributing to these binding constraints, which (as detailed in the rest of this report) DRBB aims to address.

Figure 1: Some binding constraints inhibiting disaster-responsive PFM



Source: World Bank. Produced using Whimsical.

Note: DRF = disaster risk finance; DRM = disaster risk management; HR = human resources; PFM = public financial management.



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DISASTER RISK–BASED BUDGETING ENTRY POINTS

DRBB refers to the consideration of disaster risk throughout the budget cycle, where:

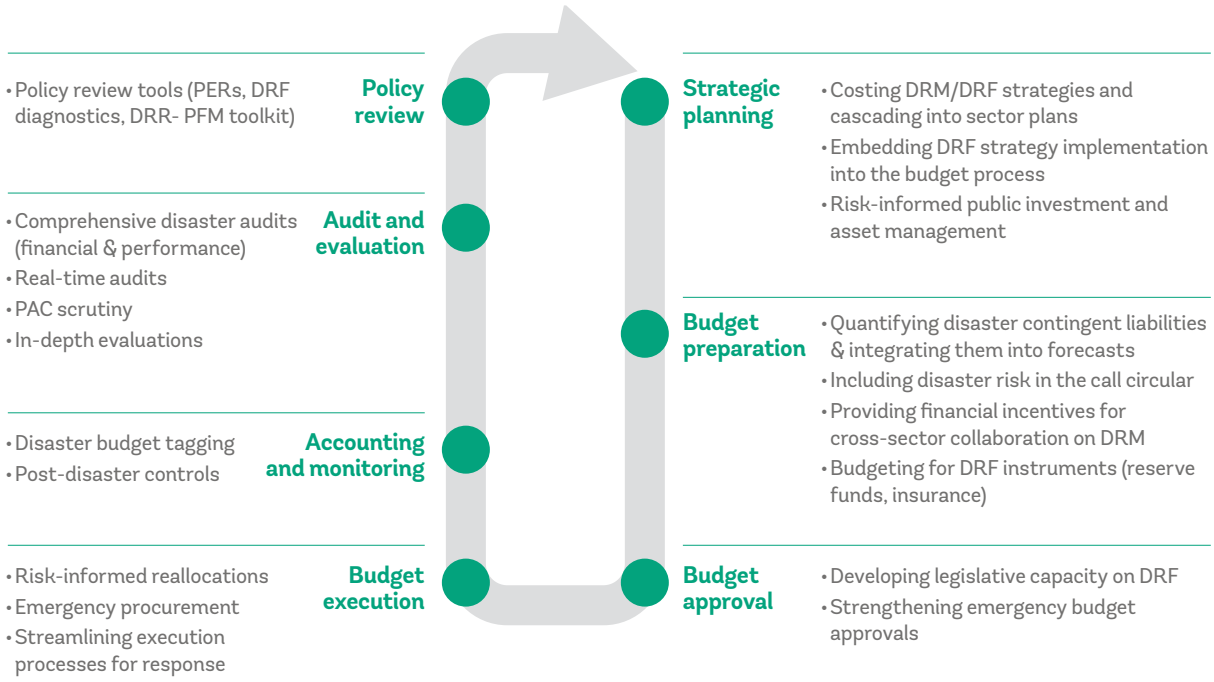
- Disaster risk refers to "the potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity" (UNDRR, n.d.).

- The budget cycle refers to the steps taken by government to ensure that public expenditure is well planned, executed, and accounted for. The exact steps are defined by a country's legal framework, but typically include processes for strategic planning, budget formulation, budget approval, execution, monitoring and accounting, and finally audit and oversight.

DRBB is an approach to budgeting in which central finance agencies calibrate their PFM systems to proactively manage disaster risk and to increase the sustainability of DRF options and solutions. It aims to address the binding constraints highlighted in section 1.2. The rest of this section lays out some potential entry points for integrating disaster risk considerations into the different phases of a generic budget cycle.[14]

This review seeks to cover the breadth of binding constraints and entry points; follow-up studies are expected to consider these issues in more depth. As figure 2 implies, there are potential entry points in all stages of budgeting, which could be applied at the national, subnational, or sectoral level. These span upstream PFM processes, concerned in large part with the adequacy of financing for disasters, as well as downstream PFM processes, which deal with how effectively those funds are executed. It is worth noting that these entry points do not only serve the disaster risk agenda; they also could be used to promote any cross-cutting priority in the core budget process that would benefit from a mainstreaming approach. The identification of DRBB entry points draws from lessons learned in budgeting for climate change, poverty, nutrition, gender, and other issues.[15]

Figure 2: Entry points for the consideration of disaster risk in the budget cycle



Source: World Bank.
Note: DRF = disaster risk finance; DRM = disaster risk management; PAC = public accounts committee.

14. The generic budget cycle framework is drawn from World Bank (1998).
15. See for example Simson (2012); Budlender (2014); World Bank (2021b); Piatti-Fünfkirchen et al. (2023).

2.1. Strategic planning

The strategic planning phase of the budget cycle is when the government defines its goals and objectives in line with policy priorities, and sets out how it intends to achieve these goals and objectives with a view to organizing the delivery of public services over time (typically a three- to five-year period). Plans at national, sectoral, and subnational levels should be consistent with each other. Linking the financing of plans to overall fiscal forecasts and to annual budgets helps ensure the plans are affordable and can be implemented.

Integrating disaster risk concerns into strategic planning is important because it provides clarity in the disaster risk outlook and in the shared priorities for resilience building. It also provides an important opportunity to ensure that risk reduction and preparedness are given due importance and not subordinated to the more visible response and reconstruction initiatives. In turn, proper attention to risk reduction and preparedness helps to tackle perceptions that disasters cannot be prepared for.

Governments' strategic commitments, goals, and priorities in disaster risk are often part of DRM strategies or plans (which tackle disaster risk reduction and preparedness, as well as response and resilient reconstruction). DRF strategies detail how the costs of disaster will be met; among other things, they articulate the government's risk appetite (how much of the risk will be paid for from government sources and how much will be transferred to insurance markets, the private sector, and households). Setting out a government's commitment to disaster risk financing and management can support other actors in making more focused and consistent decisions. For example, in Switzerland the government has set out requirements at national and cantonal (subnational) level for the provision and uptake of insurance for a wide range of natural hazards (OECD 2015).

While numerous governments have developed DRM and DRF strategies, a recurring challenge is ensuring that they are adequately reflected in strategic plans at central, sectoral, and subnational levels (see box 3 for the example of Ethiopia). Disaster risk management is often seen as a stand-alone policy area, much like health or education, rather than a cross-cutting concern that should be cascaded into policy and planning cycles across multiple sectors. Insufficient linkage to budgets leaves DRM and DRF strategies ungrounded in fiscal realities, unlikely to be implemented, and quickly forgotten.

To maximize their impact, ***DRM and DRF strategies should be costed and mainstreamed into operational plans across the machinery of government.*** In practice, this means that the key elements of DRM policies are integrated into corresponding long-term and annual plans at central and sectoral levels; that the costs of implementing plans are documented in sector budgets; and that funding sources are accounted for in sector budgets. The process of mainstreaming plans likely requires DRM and DRF to be led from the center of government, with political commitment and technical expertise from the central finance agency to ensure that the budget itself reflects DRM and DRF plans. It also requires awareness raising and capacity building among government departments to help them understand DRM strategic priorities and integrate them into their own sectoral agendas. Finally, it requires transparency around external financing sources, including donor financing for DRM and DRF initiatives.

Box 3: Integrating DRM plans in Ethiopia

Ethiopia's geographic vulnerabilities, coupled with (especially rural) poverty, mean that disasters can have a significant impact, locally and nationally. Among the most prominent hazards Ethiopia faces are drought, flood, locusts, conflict, and epidemics, all of which are made worse by climate change. The government has drawn up two key strategies to tackle climate change and disaster risk: the Climate Resilient Green Economy Strategy (2011) and the National Disaster Risk Management Policy (2013). Both focus on disaster risk in the agriculture, water irrigation, and energy sectors.

In devising its 10-year development plan (2021–30), which would in turn direct medium-term sector plans, the government wanted to ensure alignment with these policies. A review of the draft 10-year development plan (funded with support from the UK) showed that the plan did not integrate disaster risk considerations or adequately reflect the DRM policy. The review also noted that though the climate strategy was reflected in the plan, the skills and expertise to implement the plan were not in place. In response, the Planning and Development Commission revised the pillars of the strategy to include disaster risk, and checklists were provided to sectors to ensure relevant initiatives were included.

In 2023, the DRM policy was revised and a DRF strategy was published alongside it, which indicates that the policy will be financed through a mix of existing and new risk financing instruments.

Source: Tesso 2019; Ministry of Finance 2023.

For a country that has a **DRF strategy in place, it is important to ensure that the DRF strategy is also linked to the annual budget process**, which is a key mechanism for its implementation. For example, the start of the budget process could be an opportunity to refresh decisions about what level of risk transfer and risk retention the government can afford, as well as how much it needs to allocate for insurance premiums, reserve funds and other contingencies, and investments in risk reduction and preparedness. In New Zealand's Wellington City, the 2015 Insurance Management Strategy dictates the instruments the city council can use to meet earthquake costs (these include asset insurance, contingent credit, cost sharing with the national government, and council budgets). It also seeks to set internal limits to some of those instruments (for example, the budget for insurance deductibles is limited to NZ$20 million) in response to the statutory requirement to prepare for a 1-in-1,000-year event. Beyond these guidelines, annual decisions are made concerning the actual amount of asset insurance to take on (and subsequently the amount of contingent credit needed to cover remaining loses, and the budget required for premiums and deductibles), in line with the council's budget preparation process. In 2022, the combination of inflationary pressures (driving up the valuation of assets) with the release of a new seismic hazard model (reflecting increased risks) resulted in a steep jump in the expected losses, in turn leading to a review of the insurance strategy, which is currently ongoing.[16]

Public investment and asset management receive particular attention in DRBB because public assets

16. Based on Wellington City Council (2015); World Bank team interviews with Wellington City Council staff, January 2024.

are so significantly exposed. For some hazards (such as floods, earthquakes, and typhoons), damage to publicly owned assets usually constitutes a significant portion of overall disaster expenses, one that imposes a long-lasting financial burden on the budget. Additionally, harm to crucial infrastructure amplifies the economic and social consequences of the disaster by impeding access to vital services. **Risk-informed public investment and asset management** seeks to limit these costs and knock-on consequences, by embedding disaster risk concerns in asset life-cycle management. It may include such initiatives as screening for and mitigating disaster risks during project design and development, registering acquired assets and indicating their vulnerability to disaster hazards, and understanding the economic implications of disruptions to give a complete picture of the government's exposure. It can also include risk reduction measures, such as risk-informed asset acquisition, design, and building codes and regulations; diversification and business continuity planning to minimize disruptions; and asset maintenance and disposal. Funding of maintenance is also important to improve assets' disaster resilience. Risk-informed public asset management may also promote efforts to manage any residual risk of losses, for example through public asset insurance (discussed more in the next subsection); such insurance requires an understanding of the value and vulnerability of assets, meaning a public asset registry is usually a prerequisite for any public asset insurance program.

The strategic planning process can be used to embed risk considerations in public investment plans; for example, line agencies can be required to screen new investments' vulnerability and exposure to climate and disaster risks, detail how new investments adhere to risk reduction requirements, and ensure that asset maintenance and disposal costs are properly accounted for in sector budgets. The budget process can be a useful tool for making public investment and asset management a center-led, all-of-government approach, one that gives the government a holistic picture of its stock and flow of assets, considering their exposure, sensitivity, and adaptive capacity. As the experience from New Zealand underscores (box 4), a centralized approach can bring economies of scale for risk reduction and financial protection and can enable more strategic decision-making.

Box 4: New Zealand's evolving approach to public asset management

In New Zealand, the management of assets is an agency-level responsibility, with minimal central oversight and no central register. The Canterbury earthquakes of 2011 caused damage estimated at around NZ$40 billion, or 20 percent of GDP; but they had only moderate national macroeconomic impact, in large part because of high levels of private and public insurance coverage relative to other high-income countries (the insurance liability totaled just over NZ$32 billion). That said, significant underinsurance of public assets was reported.

Since the hardening of insurance markets, agencies have come together in clusters to collectively insure assets (such as district health boards coming together to insure hospitals). Some agencies have opted to self-insure assets through funds created via proactive budget allocations and/or dedicated user levies/taxes; for example, the New Zealand Transport Agency has established a levy-based contingency fund for damage to roads, bridges, and tunnels.

Behind these pockets of collective action, there is a growing consensus that a center-led approach could bring significant opportunities, and the government is considering options for a collective approach to the financial protection of public assets. By pooling risk for all of the national government under a single program, it is posited that the government could achieve economies of scale in premium prices and could help minimize pricing volatility. In addition, a consolidated approach to local and international markets would help ensure that the government is strategic in its use of limited insurer capacity. Finally, making use of a holistic view of the national risk profile would enable informed decision-making on the financial management of risks, including how much to retain on government balance sheets and how much to transfer. New Zealand already has a fairly centralized approach to insuring private (residential) property against disasters, which it does through the government-backed Earthquake Commission.

Source: World Bank 2021c; and Antich et al. 2023.

As a first step, countries looking to integrate disaster risk concerns into their strategic planning should ensure DRM strategies are costed and that key initiatives are cascaded into sector plans and budgets. Those with a DRF strategy should revisit it during the annual budget process to ensure its continued relevance and application. A first step in integrating disaster risk considerations into asset management would be registering public assets and indicating their vulnerability to the most prominent disaster risks the country faces; as noted, this is a prerequisite for a public asset insurance program.

2.2. Budget preparation

Budget preparation typically starts with forecasting revenue and expenditures and setting macroeconomic and fiscal targets. Priority fiscal risks may be modeled to see how these impact the paths forecasted. This modeling can include disaster risks to make their impacts more widely expected.

The central finance agency, typically in consultation with the cabinet, defines expenditure limits for line ministries using budget circular guidelines. For cross-sectoral concerns, such as disaster resilience, this is particularly vital, as the budget guidelines can establish shared priorities that apply to all spending agencies. Ministries then draft budgets, carry out consultations, and submit budgets for bilateral hearings with the central finance agency. Using the government-wide process of budget preparation so that all relevant agencies consider and collaborate on DRM helps address institutional coordination challenges.

A foundational step in the integration of disaster risk into budget preparation is to ensure that the potential costs of disasters are known, along with the probability that those costs will be incurred in any given year. ***Identifying and quantifying disaster contingent liabilities*** is key: this step can use historical government expenditure and revenue trends and a qualitative review of cost sharing to arrive at an assessment of direct fiscal impacts on revenues and expenditures along with (a narrow set of) associated contingent liabilities triggered by disasters. Over time, this effort could evolve into a comprehensive balance sheet approach[17], one that also takes into account indirect fiscal costs (such as the impact of a credit rating downgrade on borrowing costs) and the impact of the value of public assets and liabilities (due to public infrastructure damage, as well as the potential rise in interest paid on debt, in cases where disaster leads to an exchange depreciation). Contingent liabilities can be modeled for a range of disaster events of varying severities. However, data needs for comprehensive probabilistic modeling are substantial. A growing number of countries are routinely meeting this challenge, including Colombia (see box 5); but many countries cannot regularly update such models or even afford to purchase them. A simpler approach starts by looking only at direct costs, drawing on historical disaster expenditures where available (World Bank 2021c; OECD and World Bank 2019). Given that vulnerability and resilience to climate change can affect the cost of government borrowing (Cevik and Jalles 2022), quantifying and introducing proactive budgeting for contingent liabilities could help protect sovereign ratings from the adverse impact of disasters.[18]

Once the disaster contingent liabilities are identified and quantified, the estimates should feed into medium-term forecasting exercises to determine whether disaster impacts constitute a significant fiscal risk (that is, whether they cause significant deviations from the central forecast of key macro-fiscal variables, including debt and the fiscal balance). Such an exercise, conducted by central government, provides a central finance agency with a rudimentary idea of the fiscal space and/or reserves required to respond to shocks without pushing debt toward unsustainable levels. Usually, this function is done in house, although as the example of the UK shows (see box 5), fiscal forecasting and risk analysis can also be undertaken by official independent fiscal watchdog institutions.

17. Central finance agencies are progressively shifting from a focus on fiscal deficit and surplus to a more comprehensive balance sheet approach, which adds details of assets and liabilities and considers other impacts such as debt and interest rates. This enables governments to take a longer-term view of fiscal management and to consider more complex and longer-term impacts of public policies on public finances. This approach is not covered in this report, which focuses on general government; but for a discussion of sovereign asset and liability management in relation to disasters, see World Bank (2021c).

18. More research on the implications of these measures for countries that enact them would be valuable.

Box 5: Quantifying disaster-related contingent liabilities in Colombia, the UK, and the EU

Colombia's diverse topography exposes it to various natural hazards, including earthquakes, landslides, volcanic activity, cyclones, floods, and tsunamis. The Risk Deputy Directorate of the Ministry of Finance and Public Credit (MHCP) works to reduce Colombia's fiscal vulnerability by monitoring the risks that government assets and liabilities are exposed to. Colombia's annual Medium-Term Fiscal Framework (MTFF) routinely includes contingent liabilities related to natural disasters, which have been quantified using scenarios for climate- and other hazard-induced disasters. According to the 2022 MTFF, 3.9 percent of Colombia's GDP could be lost due to the impact of events related to climate change such as floods (1 percent) and droughts (0.3 percent), as well as other natural phenomena such as earthquakes (2.7 percent). These figures show that disaster-related contingent liabilities pose a significant fiscal risk. A revised methodology for quantifying these contingent liabilities at the national level was recently approved by the MHCP. The revised methodology seeks to provide more accurate estimates based on probabilistic techniques and will quantify the potential contingent liabilities due to disasters related to (i) the reconstruction of infrastructure and other public assets, and (ii) the expenses incurred during the emergency and rehabilitation phases. The capital district of Bogotá is in the process of adapting this revised methodology to quantify its contingent liabilities for inclusion in its own MTFF. A better quantification of contingent liabilities due to disasters will allow estimation of financing gaps with respect to financial instruments currently used (e.g., National Disaster Fund, public asset and agriculture insurance, contingent loans), and will allow policy makers to reduce fiscal vulnerability by expanding or reducing these instruments, and by contracting or implementing new instruments (e.g., catastrophe bond, parametric insurance).

In the UK, medium- and long-term forecasting is outsourced to the independent Office of Budget Responsibility (OBR). Its report on fiscal risks and sustainability presents long-term fiscal projections and analysis of major potential fiscal risks. These major risks change with each publication and are selected based on what is considered tractable and of high potential impact; in 2021, they included the impact of climate change, specifically more severe and frequent flooding and heat waves, on the UK's long-term outlook. Drawing on existing models from the Bank of England's Network for Greening the Financial System, overlaid with the government's spending plans as reported to the Climate Change Commission, the report modeled the fiscal consequences of climate change under different temperature scenarios, including the impact of the government's stated debt targets. The Treasury is required by law to respond to OBR's fiscal risk analysis, and it uses the analysis to engage with line departments on risk management.

Within the European Union (EU), discussions are currently ongoing to potentially amend the EU's 2011 directive on budgetary frameworks of the member states. The amendment calls for the publication of disaster- and climate-related contingent liabilities, and for the assessment and publication of disaster- and climate-related losses and fiscal costs, as well as the instruments used to mitigate or cover them. This would expand what is already current practice in some EU member states. For example, in Georgia the fiscal risk statement provides a historical perspective on financial losses and numbers of people affected by disaster, offering a forward-looking assessment of annual expected damage at different periods, as well as an overview of budgetary DRF instruments.

Source: Barragan 2021 OECD and World Bank 2021; OBR 2021; World Bank and European Commission 2024.

Ensuring that disaster-related fiscal risks are visible and clear allows the government to balance short-term demands with long-term resilience, make tough choices and trade-offs with finite resources, and coordinate action across sectors. For example, ***disaster risk can be flagged in the budget call circular*** as a priority for agencies to include in their submissions, and sources of information on the components of disaster risk (i.e., hazard, exposure, vulnerability, and capacity) can be highlighted to

guide spending plans. The budget preparation process can also be configured to provide ***financial incentives for interagency collaboration on disaster resilience budgets;*** in the Philippines, for example, additional funds are earmarked for a number of cross-sectoral budget programs (box 6).

Box 6: Cross-sectoral program budgeting in the Philippines

Since 2012, the Philippines has been operating what it terms Program Convergence Budgeting (PCB). This reform was introduced to facilitate and incentivize coordination between agencies on priority interagency programs. Agencies are required to collaboratively identify, integrate, budget for, and monitor activities relating to a number of cross-sectoral areas. Where previously departments found it difficult to get Department of Budget Management approval for line items relating to interventions that were the core mandate of another agency, funds are now earmarked for convergence programs, and any contributing agency can apply for them. The Risk Resiliency Program brings together 31 agencies under the leadership of the Department of Environment and Natural Resources.

Source: Department of Budget Management, forthcoming.

It is also important that during the preparation of the annual budget, ***sufficient funding is provided for the DRF instruments***, including disaster reserve funds and insurance instruments, that are in place to cover a portion of disaster costs. Meeting this requirement is often a political economy challenge, but still requires robust technical inputs and evidence. This would include determining an appropriate and evidence-based annual allocation for a disaster reserve fund; the allocation should be sufficient to enable the government to mount an effective response, while avoiding the risk of having excessive funds lie idle (with the opportunity cost that that implies). Different countries have adopted differing approaches for funding disaster reserves, but most mandate that a proportion of government expenditure, revenues, or GDP be allocated to the fund (international experience suggests reserving up to around 3 percent of spending, depending on the extent of vulnerability) (Cebotari et al. 2009; Cevik and Huang 2018). Other more sophisticated approaches seek to link disaster fund allocations to expected needs; these are informed by a model of expected losses and a risk-layering strategy that defines the type and severity of a disaster the reserve fund can be used for (typically the lower end of severity events, i.e., those with a 1-in-5-year return period or less).

Adequate budgetary provisions for disaster insurance would also be important at this stage (including sovereign insurance, agricultural insurance, or insurance for public assets). These provisions need to consider several aspects:

- **Budgeting for insurance premium and deciding on insurance cover.** The budget needs to cover the cost of the annual premium alongside an estimated cost of administration (including broker fees, for example). The amount assigned to insurance coverage can be fixed in advance, and the coverage sought should be as cost-effective as possible based on the available

funds. Alternatively, budgets can be set to cover optimal coverage after the initial pricing and structuring stages. In practice deciding on coverage likely requires some back-and-forth between the central finance agency, policy holder, broker, and the market, which needs to be timed to align with the budget preparation calendar. Importantly, the central finance agency needs to be clear on the policy objectives of insurance—in particular the severity of events the insurance is designed to cover (usually defined in the risk-layering strategy). Otherwise there is a tendency for budget departments to negotiate down the budgets for premium costs, which in turns reduces the amount of coverage that can be bought and might mean that insurance fails to meet its strategic objectives.

- **Allocation of the budget and ownership of insurance.** Consideration also needs to be given to how that cost will be allocated in the budget. A single centralized appropriation is one option; alternatively, participating government agencies may be required to contribute a share (based either on a flat rate per unit insured or on the level of expected risk of each agency) (Antich et al. 2023).
- **Creating the right incentives.** In creating insurance programs or purchasing insurance, governments may create a moral hazard problem where these programs inadvertently reduce incentives for insured people to undertake adequate risk reduction and preparedness. Favorable incentives need to be proactively created. For example, Mexico's FONDEN, a budget account that provided resources for the rehabilitation and reconstruction of uninsured or underinsured public assets, was structured to incentivize agency-level risk transfer: the share of reconstruction costs covered by the fund tapered off for second and third claims in cases where agency assets were not insured by the agency. FONDEN also established cost-sharing arrangements with state governments, in which up to half the costs of reconstructing local assets were covered for a first claim, but successively less was covered for repeat claims where the states had not taken out their own insurance (World Bank 2012).
- **Sustainability of budgets for insurance over the medium term.** The price of insurance will somewhat vary year to year, but allocating an indicative amount for premiums on a multiyear basis—for example by including them as a line in the medium-term expenditure framework—can enhance sustainability of insurance instruments and offer some longer-term predictability to the agencies being insured.

There are many ways in which risk can be integrated into budget preparation processes. As a first step, a government might want to start modeling the fiscal impacts of the most significant disaster risks (drawing from historical expenditures where probabilistic modeling is not yet available). It can then use this information to consider whether spending on risk reduction and preparation needs to be better incentivized (which can be done through the call circular and additional funding incentives) and whether instruments for disaster response are adequate for needs.

2.3. Budget approval

The budget approval process typically consists of the finalized budget being presented to the legislature, scrutinized by a budget committee, and discussed in a series of hearings, which may involve academic or civil society participation. After legislative approval, the budget becomes legally binding.

Legislative awareness of, engagement with, and oversight of planned disaster spending enables lawmakers to generate political capital from investments in risk reduction, preparedness, and sound financial planning for disaster shocks (which would otherwise more routinely be derived from response measures). Because disasters can significantly impact government spending, they sometimes require the legislature to further approve amended or supplementary budgets. Given the urgent nature of disaster response, stakeholders in the legislative process (legislators, civil society, academic experts, and citizens, among others) will likely not have adequate time to properly scrutinize budget changes. To a certain extent, the integration of DRM and DRF concerns into strategic plans and into the preparation of the original annual budget should minimize budgetary changes following an emergency. However, strengthened scrutiny in the annual budget process should be complemented by strengthened procedures for scrutiny of supplemental spending requests during disaster response.

Legislatures are unlikely to have in-house expertise on DRF, particularly as a resource that can stretch across the budget scrutiny process and be available for sectoral committees and broader groups of elected representatives. Legislatures often operate with significant budget constraints and are thus limited in how much specialized expertise they can hold in house. However, there are ways in which to develop ***legislative capacity for scrutiny of DRF***. In the short term, existing representatives and staff can seek to engage in peer learning and exchange, either bilateral or multilateral (where opportunities arise). Such events could enhance learning and promote sharing of experience at local as well as national levels. In 2024, the World Bank supported the Philippine Department of Budget Management in delivering an introductory course to research and committee staff from Congress, including the Senate. This training aimed to increase exposure to and understanding of key DRF and DRBB concepts and sources, as well as explore how support to elected representatives could integrate this knowledge and information.

For medium-term impact, some legislatures have sought to strengthen engagement with and learning from academic communities, which could be helpful in providing specialized guidance and expertise to scrutinize policies and budgets. The UK Parliament has established a small Knowledge Exchange Unit that facilitates engagement between researchers and the Parliament and that supports researchers in engaging with policy and scrutiny processes. Short-term secondments have been established, where academics are attached to relevant committees to provide direct guidance. The UK's Parliamentary Office of Science and Technology (POST) team has established secondments (fellowships) sponsored by professional associations. These initiatives support the use of evidence and help bring in expertise on DRF without significant long-term cost implications.

While countries often have procedures in place to enable swift budget approvals when a disaster occurs (such as streamlined approval for supplementary budgets), an accelerated timeline for scrutiny and approval can mean crucial perspectives and evidence are missed, leading to poorly designed disaster responses. Disaster responses also tend to be strongly informed by political considerations, which may not always align with evidence. ***Establishing and strengthening preparatory processes for***

emergency budget approvals could counter this risk by supporting evidence-informed responses and ensuring that good standards of response and accountability are maintained, including (where feasible) publicly available information and decision-making. Many countries have emergency budget approval processes in place, but when faced with the scale and duration of the COVID-19 pandemic, a number of countries had to improvise procedures because their emergency measures were not sufficient (OECD 2020). For example, New Zealand's Parliament, the Pāremata Aotearoa, improvised by making use of the imprest supply process to pass emergency funding for pandemic response. This process is the statutory mechanism that allows Parliament to provide the government with the authority to incur expenses and capital expenditure before passing the Appropriation Act and to make capital injections before authorization. However, in March 2020, the Parliament passed a third Imprest Supply Act for NZ$52 billion (almost US$31 billion), and for 2020/21 the approved second imprest Supply Act amounted to NZ$56.5 billion (almost US$33.5 billion), a significant increase from the approved second Imprest Supply Act for 2018/19 of NZ$16.3 billion.[19] The imprest supply process is not usually subject to detailed ex ante scrutiny but is generally debated only briefly in Parliament. The UK Parliament faced similar challenges during the COVID-19 pandemic (see box 7).

Box 7: Approval of COVID-19 spending in the UK Parliament

The scale and impact of the COVID-19 pandemic was not anticipated in a number of countries, including the UK and Australia. In 2020/21 alone, UK government spending is estimated to have been £179 billion higher than anticipated.

The UK Contingencies Fund Act allows for contingency spending of up to 2 percent of the previous year's cash spending. However, in response to the scale of the COVID-19 pandemic impact, the UK Parliament approved a procedure to increase the share to 50 percent. Some Members of Parliament felt the approval process was unduly rushed. In making this case, Sir Edward Davey, an opposition Member of Parliament, paraphrased a pamphlet he had written on budget scrutiny: "This House does not really have sovereignty over the Budget. We look at these Bills when they come along and we nod them through, but our processes of examining draft budgets and estimates are shocking" (UK Parliament 2020).

The approvals process for the Coronavirus Act 2020 was also accelerated; it condensed what is normally an 11-week process into just four days. The UK Parliament noted that members could not scrutinize the bill in detail in that short time frame. Moreover, the Civil Contingencies Act 2004, which was established to enable the UK government to respond to civil emergencies, was not used. The government argued that the act was not suitable because it was established to respond to sudden events rather than the gradual emergence of an epidemic.

In 2023 the UK Parliament passed the Procurement Act (to come into force in October 2024). This legislation draws on learning from the pandemic and contains clauses specifically focused on emergency procurement. The aim is to minimize direct awards of contracts in response to an emergency and instead condense the competitive process, thus ensuring timely delivery of goods and services while retaining transparency.

Source: Brien and Keep 2023; OECD 2020; UK Parliament 2020; Public Administration Committee 2020; UK Cabinet Office 2023.

19. Based on Controller and Auditor General (2020); World Bank team interviews with New Zealand House of Representatives staff member, November 2023.

Lessons from the COVID-19 pandemic could inform a process of establishing or strengthening ex ante measures that reinforce Parliament's role in scrutinizing the budget as part of the approvals process in disaster contexts. More research in this area that addressed some key issues could be valuable. In particular, the provision of timely evidence and analysis is critical. The OECD (2020) noted that, due to the speed of the disaster response during the COVID-19 pandemic, some legislatures reduced or delayed the requirement to have analysis accompanying the budget. Moreover, legislators did not always have access to high-quality, independent analysis. Some legislatures relied on external think tanks for information, but provision of and access to analysis could be uneven. This limitation is particularly important when considering the complexity of some arrangements that legislators would have to consider, for example government use of loans or guarantees.

As a first step towards the adoption of DRBB in budget scrutiny processes, legislatures should take an evidence-informed approach to devising procedures for budget scrutiny in an emergency. They may decide to include additional budget for the provision of swift and specialized analysis; require the government to provide data and analysis for decision-making; or codify procedures for remote committee meetings and the delivery of awareness-raising activities by governments and other relevant institutions.

2.4. Budget execution

This stage of the budget cycle involves implementing government activities. The budget execution process begins with the release of funds by the central finance agency in accordance with the legislature-approved budget. Line ministries then allocate funds to spending units, enabling the initiation of procurement processes or issuance of payment orders.

While these processes may be accelerated in periods of disasters, robust controls help maintain high standards of accountability. Budget revisions can occur through virements (transfers between budget items) and supplementary budgets (for exceptional changes or performance management purposes). In a disaster these are very commonplace, but efforts can be introduced to ensure their costs are fully appreciated. Disaster response can often require an increase in public spending in areas that were not anticipated. This increase can be met in a number of ways, such as through domestic contingency funding, insurance schemes, budget reallocations, or international funding. Given the unexpected nature of disasters, the execution of this funding becomes the next challenge. By establishing systems and processes before a disaster occurs to promote evidence-informed decisions on how and where to deliver funding, it is possible to tackle common challenges in disaster budget execution, including challenges related to uncertain funding amounts and routes and to maintaining standards in spending quality, transparency, and accountability.

Following disasters, governments often rely on budget reallocations to fund response efforts. Among other advantages, this approach offers swift access to funds, especially where transfers are within virement parameters. Governments typically have legislation in place to allow for some limited reallocations through virements and supplementary appropriations. However, disasters often require significant budget reallocations that may exceed stated limits, or require a higher volume of changes in a shorter time period than is usual. In particular, budget lines associated with social protection, health services, debris clearing, and asset reconstruction are likely candidates for additional funding. There

may also be reduced requirements from other parts of the budget due to disruption or restrictions arising from the emergency (for example, in South Africa, tourism activities shut down during the height of the pandemic, leading the government to cancel tourism budgets). Budget reallocations have often been seen as a cost-free financing instrument, but postponing or canceling viable government spending incurs an opportunity cost in terms of forgone returns. Such costs are not routinely factored in by governments, and evidence from Albania (see box 8) suggests these could be significant.

Box 8: The opportunity cost of budget reallocations in Albania

The Government of Albania used virements, normative budgets (supplementary budgets), public sector borrowing, and its Council of Ministers Reserve Fund to respond to the increased budget pressures brought on by the COVID-19 pandemic response. By creating a counterfactual of what spending outturns would have been in the absence of the shock, research from the World Bank estimated that total budget reallocations in 2020 amounted to lek 17.7 billion (US$163 million), equivalent to 93 percent of total COVID-19 expenditure that year, or 5 percent of total expenditure.

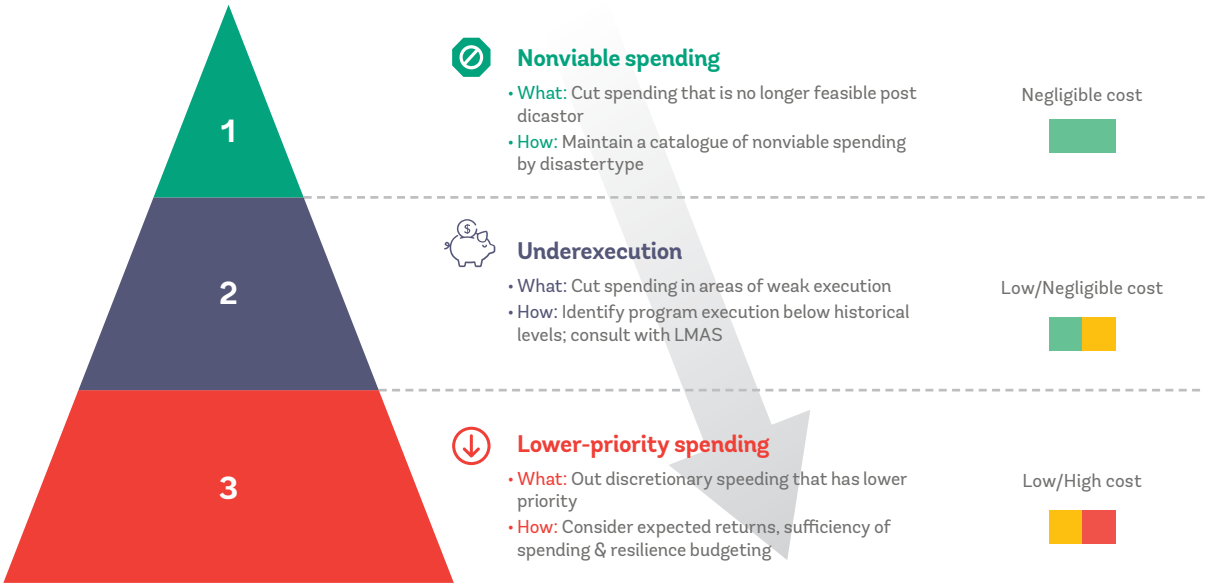
Of the lek 17.7 billion underspent, the study estimated that lek 7.8 billion was nonviable spending (i.e., it was cut from budget lines that could not have proceeded because of the widespread restrictions in movement and economic activity), but that the remaining lek 9.9 billion had incurred an opportunity cost. A significant portion of the cuts fell in the education and defense sectors.

Overall, the study estimated that had the viable spending not been postponed or canceled, it could have generated returns of lek 12.3 billion (US$113 million), which is equivalent to 0.76 percent of 2020 GDP, or 65 percent of COVID-19 expenditures. This implies an opportunity cost multiple of US$1.23 for every US$1 mobilized through budget reallocations.

Source: World Bank 2021a.

Risk-informed budget reallocation refers to the process of moving funds between budget lines in response to a disaster, in a manner that minimizes associated opportunity costs. The study in Albania (World Bank 2021a) provides a framework for this. As a primary step, countries should systematically identify any nonviable expenditures through rapid post-disaster needs assessments or satellite technology. They should also maintain a dynamic record of nonviable expenditure tailored to hazard scenarios. Diverting funding from these areas is likely to incur only negligible opportunity costs. Following this, the framework proposes that the government should reallocate funds from areas experiencing sluggish execution performance, thereby ensuring that funds are not left idle during periods of financial scarcity. Finally, lower-priority spending is targeted within discretionary expenditure domains. Although defining this area is more intricate, insights into sectoral priorities, anticipated returns on public investments, and the overall adequacy of sector budgets can guide decision-makers. This approach would not only reduce uncertainty in the process and limit associated costs, but would also strengthen transparency and accountability processes, given that the decisions and actions would be documented as part of standard procedures.

Figure 3: A proposed framework for structuring post-disaster reallocation decisions



Source: World Bank 2021a.
Note: LMAs = line ministries and agencies.

Governments can also put in place ***emergency procurement procedures and protocols*** to speed up the procurement of goods and services in a disaster. However, such expedient procedures should still ensure adequate accountability, transparency, and overall value for money. For example, these protocols may allow direct award of contracts for relief or rehabilitation services. Alternatively, governments may set up prearranged contracts (or framework agreements) with trusted private sector partners that facilitate quick mobilization of the needed rehabilitation workforce by allowing government agencies to skip the procurement process and start work immediately. The Government of Japan has such contracts in place with companies covering construction, engineering, surveying, and telecommunications; this arrangement offers a guarantee of payment without burdensome contracts and paperwork. The Great East Japan Earthquake (and subsequent tsunami) of 2011 caused tremendous damage to infrastructure and public utilities (estimated by the Government of Japan to total US$43 billion), but thanks to the instruments in place, the main highways and roads to affected areas were repaired within one week, and the bullet train service was resumed within 49 days. This work, in turn, supported relief activities in the affected areas (Ranghieri and Ishiwatari 2014, 171–74).

Planning how to disburse funding in a disaster is as important as planning how to raise it, so ***streamlining execution processes for disaster response programs***, especially at local level, is critical. This effort could include developing clear targeting and disbursement channels for shock-responsive social protection, so that support is delivered to the right people at the right time. For example, preparation could be made for using mobile money in cases where access to formal banking infrastructure might be disrupted. Streamlining of execution could also include advance planning around access procedures for reserve funds. Such planning could

benefit the Philippines, for example: the country has over 43,000 Local Disaster Risk Reduction and Management Funds, but many local governments are unclear about the conditions under which these funds can be used. As a result, they continue to rely on the national government, and many of these funds lie dormant.[20] Moreover, the Philippine Development Plan (2023–28) noted that the 2016 People's Survival Fund was not fully utilized and that only six Local Government Units were able to access its funds. The low uptake has been attributed to a lack of local capacity to respond to the application requirements (Government of the Philippines 2023).

A first step for a government seeking to better integrate risk into budget execution processes would be to review the disbursement procedures and performance of key disaster response programs and identify bottlenecks that undermine spending timeliness and efficiency. It could also be worthwhile to review the experience of procurement entities and suppliers in implementing existing emergency procurement processes, and to develop additional or more streamlined procedures and provide guidance and training where required. In the event of a disaster, documenting reallocation decisions (where money is cut, where it is augmented/protected, and the reasons why) could help the development of a more formal framework for future shocks.

2.5. Accounting and monitoring

Accounting and monitoring of revenue and expenditure ensure the budget is implemented as agreed. Monthly, quarterly, and annual reports are generated concurrently with budget execution. Key aspects include a control function, ensuring funds are used correctly, and a development function, ensuring budget execution aligns with intended targets. Implementing agencies are typically responsible for accounting and monitoring their own budgets, while the central finance agency has a role in coordination and standard setting—that is, in checking whether appropriate monitoring information is generated and reaching decision-makers.

Disasters typically result in a surge in public expenditure, which alongside expedited procedures can increase the risk that funds are misused. Robust accounting and monitoring processes are therefore paramount. Furthermore, to enable the strategic allocation of resources and decisions on trade-offs, governments need an accurate and comprehensive picture of how much they are spending on avoiding, preparing for, and responding to disasters. This need was highlighted in the UK National Audit Office (NAO) 2023 audit of extreme weather events, which noted that the government does not know how much the public sector is spending to manage extreme weather risks because "action is taken across a wide range of organizations [and] there is no common definition of what constitutes resilience activity" (NAO 2023, 46). Without this, the NAO found, it was difficult to determine whether spending represented good value for money.

Given the fragmented and multisectoral nature of disaster-related public expenditure, building up a comprehensive picture of public spending on disasters cannot easily be done through existing standard expenditure reports. In response to this challenge, some countries have introduced ***disaster***

20. Based on World Bank (2020).

budget tagging systems, which demarcate and codify budget lines that are relevant to disaster resilience. While the practice of budget tagging for disasters is relatively nascent, practitioners can learn from and build on the experience of tagging for other cross-sectoral themes (particularly climate budget tagging, which overlaps substantially with disaster budget tagging). Tagging systems are often introduced following the completion of a diagnostic (such as a Public Expenditure Review, discussed in section 2.7), or after a one-off tracking exercise associated with a particular disaster event in an effort to regularize more frequent reporting. Key design criteria include the following (World Bank 2021b):

- **Definitions and taxonomy.** These determine the boundaries of what counts as disaster-relevant spending. Determinations can draw from a national policy framework or from international frameworks such as the Sendai Framework or OECD DRR markers (OECD 2018) (see box 9 for the experience of Ethiopia).
- **Coverage.** This determines the sectors and classes of spending included. Options include taking a whole-of-government approach, or focusing on priority sectors/levels of government (which should mirror the legal and de facto responsibility for DRM). Tagging can cover capital and recurrent funds along with allocations and expenditures. Integration of the tag into an Integrated Financial Management Information System (IFMIS) can enable the wider application of the tag to different spending classes and has the potential to influence real-time budgeting decisions.
- **Institutional roles.** These determine which entities apply the tagging and perform other roles around quality assurance and oversight; they might include the central finance agency, line ministries, the DRM commission, or some combination of these.
- **Estimation methods.** These determine whether a simple binary typology or a weighting system that distinguishes between varying degrees of relevance is adopted.[21]

21. For example, the UN Office for Disaster Risk Reduction's disaster and climate budget tagging methodology differentiates between expenditures that primarily reduce disaster risks (that is, those where DRR is the principal objective or primary outcome) and those that indirectly affect disaster risk (those that are related to DRR but are not implemented with DRR as their principal objective/main outcome). Differentiated weights are applied for the two types of expenditure (100 percent and 50 percent respectively) (UNDRR 2023).

Box 9: Disaster and climate budget tagging in Ethiopia

Ethiopia is affected by droughts, floods, epidemics, insect infestations, landslides, wildfires, volcanoes, and earthquakes. The 2023 INFORM risk index covering 191 countries worldwide ranks Ethiopia as the 12th most at risk from disasters. Moreover, Ethiopia is vulnerable to the effects of climate change and has also recently experienced conflict.

The Government of Ethiopia recognizes the risks associated with disasters and climate change and is committed to adopting a multisectoral approach to reduce vulnerability and strengthen resilience. In recent years, with the support of its partners, it has conducted multiple stand-alone expenditure reviews, looking at historical spending related to climate change and disasters. However, in an effort to make such analysis more timely and sustainable, in 2023 the Ministry of Finance introduced a budget tagging system to routinely flag spending on the whole disaster cycle as well as on climate change (adaptation and mitigation).The dual system was adopted to reflect the substantial synergies between climate and disaster risk management, where spending associated with increasing resilience to hydrometeorological hazards contributes to both DRR and climate adaptation.

The tagging system is integrated into the national IFMIS and currently covers capital expenditures under priority sectors in the national government only. The tagging is done by line ministries, via climate focal points located within the sector institutions. This arrangement was adopted in order to build sector ownership while minimizing the burden on Ministry of Finance staff.

Relevant expenditures are indicated in sector-specific guidelines that draw from Ethiopian policy documents and the OECD DRR markers. Although more work needs to be done on strengthening climate budget tagging in Ethiopia, with this tagging, the Ministry of Finance is hoping to use the evidence to inform strategic resource allocation decisions (including for example, the balance of spending on risk reduction vs. response) and to demonstrate government financing to attract more external support. Line ministries would also be able to use the information generated to defend their budget proposals.

Source: World Bank 2023, World Bank Group 2024, Ministry of Finance 2023; BRE 2023.

Alongside transparent reporting, ***post-disaster control functions*** ensure that the expedited spending and augmented flexibility do not compromise safeguards. These functions may include new or streamlined protocols for spending very quickly, including through contracts, direct awards to the public and businesses, and issuance of loans. Clear separation of functions is also important to avoid conflicts of interest and reduce the risk of fraud or misappropriation—for example, a single individual or small group of individuals should not initiate, approve, undertake, and review the same action (World Bank 2022a). It is not uncommon for such controls to be in place for routine expenditure but to be loosened or suspended during times of crisis. Such a blind spot in internal controls puts more pressure on external audit and parliamentary oversight, and misses the opportunity for course correction to prevent the mismanagement of funds when a disaster response is underway.

An initial step countries can take in this area is to review where the responsibilities for initiating and approving emergency expenditures lie, and then ensure that these are different from each other and that the guidelines are widely disseminated. Moreover, thinking in advance about how decisions on public spending will be recorded can help strengthen transparency and provide a basis for more systematic budget tagging later on should that be required.

2.6. Audit and evaluation

Audits and evaluations serve important purposes for governments, citizens, and societies more broadly, particularly in democratic countries. Scrutiny of spending and of decision-making provides accountability and, ultimately, legitimacy for government.

For governments, the process also provides an opportunity to learn from successes, challenges, and failures and to reach evidence-informed conclusions, which can in turn raise expectations and standards for how disaster response can be funded and delivered. Audit and evaluation can help counteract a general lowering of propriety and standards often associated with periods of emergency. Moreover, the process of auditing and evaluating disaster expenditure and procedures also brings information into the public domain. It helps to challenge the notion that disasters cannot be planned for, and it can direct public attention toward the benefits of risk reduction and preparedness, which tend to generate less political capital for officials than disaster response.

Supreme Audit Institutions (SAIs) examine compliance and performance of budget execution. ***Comprehensive disaster spending audits*** can provide scrutiny of spending across the disaster cycle—from risk reduction and preparedness to response and resilient construction. The International Standards for SAIs (ISSAIs) cover all these aspects of disaster audits.[22] Many countries routinely conduct regular audits of national disaster commissions or agencies, including the US Office of Inspector General, which conducts frequent financial and performance audits of relief programs delivered by the Federal Emergency Management Agency (although recent research finds the increased frequency of disasters has constrained the agency's capacity to incorporate audit findings into programming) (Waddell 2024). The Philippine government goes beyond auditing the Disaster Commission and conducts an annual comprehensive audit of all disaster-related spending from all budget sources. This has been useful for identifying financial issues (for example, failure to meet stipulated funding targets for local disaster funds) as well as other performance issues (such as the absence of comprehensive DRM monitoring frameworks in certain localities).[23] Like monitoring exercises, comprehensive disaster audits need to be underpinned with a clear definition of what constitutes disaster resilience spending; an expenditure tagging system (as discussed in the previous subsection) can greatly facilitate this effort. It is also important to preserve information on disaster response processes and decisions (such as budget reallocations) for ex post scrutiny and accountability. This means having clear requirements in place to retain data and information, as well as provisions to share this information with the legislature and the SAI.

While such audits can provide important lessons, they have historically been conducted ex post. Thus government and other actors have been able to use the findings to improve responses to future expenditure processes, but not able to change the expenditure in response to the disaster that was audited. In recent years, however, some countries have established real-time audit processes, where SAIs undertake audits during the response in an effort to ensure compliance and gain information to improve the response process as it unfolds. The Auditor General of South Africa undertook a real-time audit during the COVID-19 pandemic, and the Audit Service Sierra Leone undertook a real-time audit during the Ebola epidemic (see box 10). The Sierra Leone real-time audit enabled citizens to exert pressure on government to strengthen disaster expenditure processes.

22. For example, ISSAI 5510 covers audits of DRR and preparedness, while ISSAI 5520, ISSAI 5530, and ISSAI 5540 cover aspects related to audits of individual disaster events as well as general audits of response and reconstruction spending, including the heightened risk of fraud.

23. See for example Commission on Audit (2017).

Box 10: Real-time audits in Sierra Leone

Public pressure prompted the Audit Service Sierra Leone to undertake a real-time transaction audit of funds during the Ebola outbreak in Sierra Leone in 2014. The audit process covered procurement, hazard payments, cash and bank management, and internal control. The real-time approach sought to enable timely feedback and management of funds.

The report was presented to the Public Accounts Committee in a televised public hearing, and the findings caused a public outcry. The audit report highlighted irregularities, inadequate controls, and noncompliance with the procurement process. As a result of the report, the Government of Sierra Leone improved processes to implement stronger controls, crucially in relation to the management of Ebola response funding. According to the Auditor General, the results of this real-time audit also prompted a review of management practices during emergencies. A real-time audit was again carried out during the COVID-19 pandemic in 2020.

Source: Mills 2022; Taylor-Pearce 2018.

Parliaments and, in particular, ***public accounts committees (PACs)*** can play a significant role in strengthening oversight and evaluation of disaster risk financing and disaster expenditure. A study by the Commonwealth Parliamentary Association UK (2021) found that the response of Commonwealth PACs to the COVID-19 pandemic varied depending on two factors: the PACs' ability to adapt to working virtually, given connectivity issues; and the timeliness of audit reports. Some PACs studied in the report noted that the SAIs had increased the frequency of audit reports and special audits on COVID-19 expenditure, and that the SAIs could offer support in the drafting of PAC questions to government. One PAC highlighted its creation of a whistleblowing process, which enabled the public to contact it directly and provided public reassurance of oversight. The content of the study suggests several further questions: What is the minimum standard of oversight of budget expenditure that should be expected in the immediate response to a disaster? How can that oversight be delivered? Can or should processes for special audits be standardized in a country to support timely oversight during the budget execution process? Finally, how can communication and cooperation between the SAI and the legislature be formalized and strengthened for post-disaster emergency work? Further research on these questions would be valuable.

Over a longer time frame, legislatures and SAIs can provide more ***in-depth evaluations and targeted learning*** for government in order to improve disaster risk management and financing, in turn strengthening mitigation and prevention of disaster impacts. Box 11 outlines two ways in which the UK system is using evaluation to strengthen UK government disaster risk and resilience policy, financing, and process.

Box 11: Disaster spending in the UK: Evaluations by the National Audit Office and House of Lords

The UK National Audit Office maintains a value for money (VFM) audit function alongside its financial audit function. The VFM team conducts studies on how public money is spent to achieve government objectives and to support inquiries by the UK Parliament's Public Accounts Committee. The VFM team proactively selects issue areas to focus on that can also inform PAC questions and shine a light on issues for the public. In 2023 the NAO published two studies focused on resilience, one on flooding and one on extreme weather. The report on flooding highlighted a potential issue with the government's existing plans and financing to protect properties from flooding. It noted that, due to inflationary pressures on the floods capital program, the government had reduced the number of properties that would be protected by new flood defenses by 40 percent; moreover, it was not meeting targets for maintenance of existing defenses. This report, and these points in particular, were amplified by a subsequent PAC evidence session in early 2024 and related media attention.

The UK Parliament's House of Lords formed an ad hoc Risk Assessment and Risk Planning Committee, which published a report in 2021 titled "Preparing for Extreme Risks: Building a Resilient Society." This report included reflections on DRF. For example, two witnesses providing evidence to the inquiry indicated that when prioritizing budgets, preference is given to spending that will give a short-term return. DRF necessarily includes budget items that look at longer-term prevention or mitigation, and funding for potential needs for disaster response rather than confirmed needs. Such budget proposals can be subject to overly high discounting rates and hence may be deprioritized. This report has been influential within government and informed the development of the UK Government Resilience Framework in 2022.

Crucial to this evaluation process is that the government is required to respond, often within a specified time frame. This ensures government attention to the evidence and findings. It also serves to bring a greater number of perspectives and a range of evidence into the decision-making process.

Source: Select Committee on Risk Assessment and Risk Planning 2021; NAO 2023; World Bank team interviews with National Audit Office staff, January and February 2024.

As a first step in strengthening the evaluation and audit of disaster spending, legislatures can review and discuss the relationship between the PAC and the SAI to identify opportunities and processes for working together during and following a disaster. PACs may also seek to identify a process and resources for scrutinizing post-disaster scenarios. This effort could be carried out in consultation with the legislature more broadly.

2.7. Policy review

The budget process concludes with a review and update of existing policies and the development of new ones if necessary. This is undertaken outside of the budget process timeline and so allow more time to stand back and examine evidence on policy impacts, to communicate progress in policy implementation, and to debate policy options. Establishing a formal policy review process can systematize the learning

process at the budget cycle's end, thereby helping to improve existing policies, identifying nonperforming projects, and shaping new ones.

Spending reviews focused on disaster-related public expenditure can consider the role of the state, the private sector, and households in the achievement of resilience objectives, in turn determining how much risk the government bears and how much it transfers to others. Reviews can also consider how to deploy the full swathe of policy tools—information, regulation, taxation, public spending, and risk transfer—to meet these objectives. In addition, policy reviews can be used to identify revenues and expenditures that are aligned with disaster resilience policy objectives and those that are contrary to them, while also shedding light on issues of fiscal sustainability, strategic resource allocation, the role of government, the efficiency and effectiveness of spending, and the capability of institutions.

Various policy review tools have been developed or adapted for the purposes of scrutinizing disaster expenditure and outcomes against policy objectives:

- **The DRF diagnostic** was co-developed by the World Bank's Disaster Risk Financing and Insurance Program and the Asian Development Bank as a comprehensive analysis of the economic and fiscal impacts of disasters, the legal and institutional foundations for DRM, and the current financing landscape (including the use of budgets and other risk financing instruments, PFM processes, and domestic insurance and capital markets). The analysis determines the funding gap and proposes options for improved financial protection. Often, the completion of a diagnostic is a precursor to the introduction of a DRF strategy (Benson, Mahul, and Alton 2017).
- **A disaster-focused Public Expenditure Review** (PER), and its climate counterpart the Climate Policy and Institutional Expenditure Review (CPIER), focus exclusively on the public financing component. These reviews adapt the well-established PER methodology to unpack public expenditure trends, processes, and results as they pertain to disasters (or in the case of the CPIER, to mitigation and adaptation spending, including spending related to reduce hydrometeorological disaster risk). A PER will answer key questions about the fiscal sustainability of policies, strategic allocation of resources, efficiency and effectiveness of spending, and institutional capacities to deliver these (World Bank 2014b).
- **The Disaster Resilient and Responsive Public Financial Management (DRR-PFM) assessment tool** targets processes rather than policy. Developed by the World Bank, the DRR-PFM assesses a country's PFM systems in order to prepare for, respond to, and recover from disasters. It involves a review of current PFM practice across five dimensions (planning and budgeting, public investment management, budget execution and control, public procurement, audit and oversight) and three cross-cutting themes (institutional arrangements, IT systems and records, and social inclusion). The assessment also identifies opportunities to sustain PFM functions after a disaster. Successive DRR-PFM assessments are intended to track reform implementation (World Bank 2022a).

Which policy review methodology a country selects depends on the objectives of the exercise. Where it is primarily to inform PFM processes during emergencies, the DRR-PFM assessment tool would suffice. If a broader review of public expenditure trends is required, a PER is more appropriate. A DRF diagnostic is useful for comparing current financing against projected costs and informing the development of new DRF instruments. A comparison of the scope, purpose, and requirements of each tool is given in table 1. Real-world examples of each tool's application are provided in box 12.

Table 1: Scope, purpose, and requirements of DRBB policy and process review tools

	DRF diagnostic	Disaster PER	DRR-PFM assessment
What does it cover?			
Economic/fiscal impact of disasters	√	√ partial	
Financing of disasters from domestic sources	√	√	
Financing of disasters from external sources (inc. DRFI)	√		
Financing of risk reduction and preparedness	√	depends on scope	
Assessment of PFM processes	√ partial	√	√ elaborate
Review of domestic insurance and capital markets	√		
Assessment of financing gap	√		
Recommendations	√	√	
What does it serve?			
Precusor to a new DRF/DRM strategy	√		
Precursor to budget tagging system		√	
Precursor to disaster resilient PFM reform		√	√
Tracking progress over time (through successive assessments)			√
Cross-country benchmarking			√
What are the data requirements?			
Budgets and expenditures	√	√	
Private sector/ hh insurance penetration	√		
Hazard profile	√		
Economic, fiscal and social impact assessments	√		
Information on legal and insitutional framework for DRM/DRF	√	√	
Information on PFM processes	√ partial	√	√
What does it entail?			
Average time for completion	6-12 months	6-12 months	2-4 months
DRM expertise	√	√	√
DRF expertise	√	√	√
PFM expertise	√	√	√
Actuarial expertise	√		

Source: World Bank.

Note: DRF = disaster risk finance; DRFI = disaster risk financing and insurance; DRM = disaster risk management; DRR-PFM = Disaster Resilient and Responsive Public Financial Management; HH = household; PER = Public Expenditure Review; PFM = public financial management.

Box 12: Deploying policy review tools for disaster resilience: Select examples

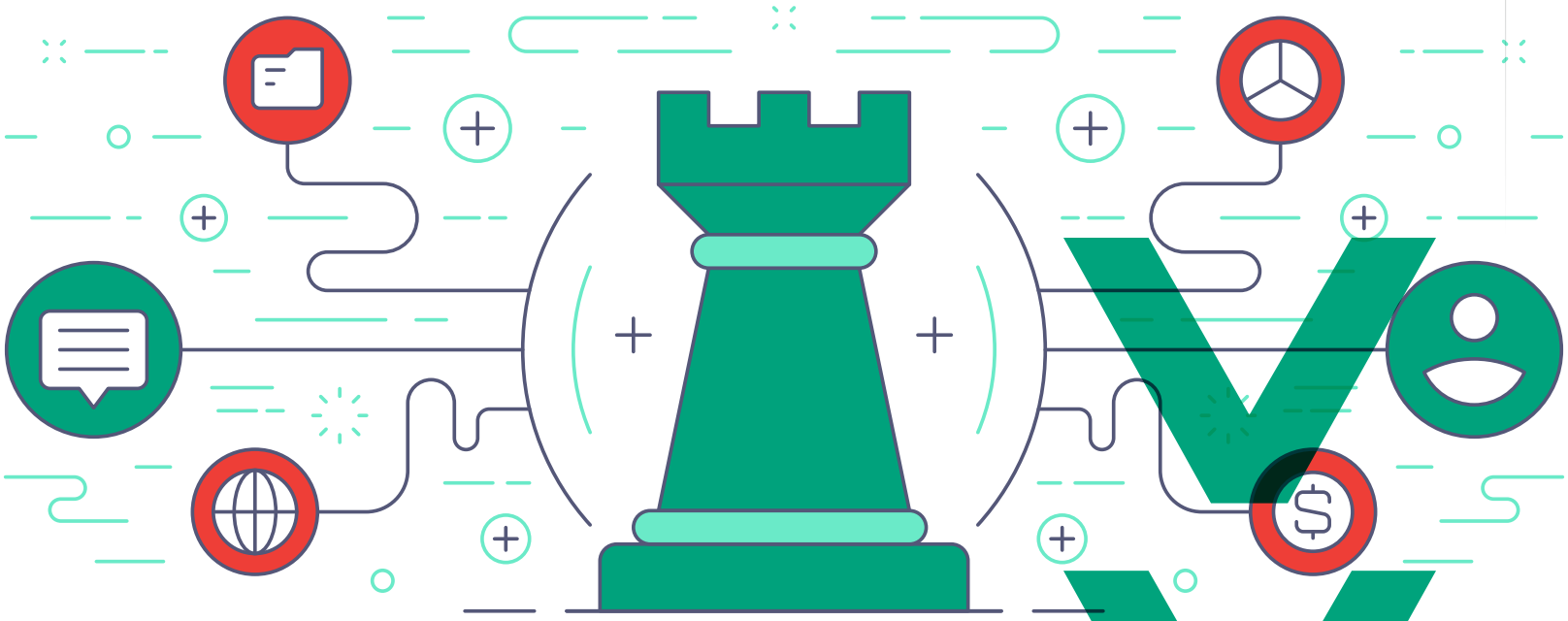
In 2022, at the request of the Ethiopian Ministry of Finance, the World Bank prepared a **climate and disaster risk finance diagnostic**, with the objective of assessing Ethiopia's financial preparedness to disasters and crises at the sovereign, firm, and household levels. The request came about as the government was facing increasingly frequent and severe disaster shocks (particularly from drought, flood, and conflict), which threatened the country's ability to sustain the robust growth and progress on poverty alleviation of recent decades. The diagnostic focused on the historical socioeconomic and fiscal impact of disasters in Ethiopia, the key legal and institutional arrangements relevant to DRF, the role of the private sector, and ways that costs of disasters are currently met. Among its findings was that Ethiopia is largely reliant on ex post financing—primarily official development assistance and humanitarian aid, budgetary reallocations, and emergency borrowing. The diagnostic provided the evidentiary underpinning and strategic direction for the government to chart an alternative path forward, which it did, launching its first DRF strategy in 2023. This document heralded a new approach to financing disaster costs, including new ex ante and risk transfer instruments, as well as a series of reforms to make PFM systems more responsive to disasters (related to disaster budget tagging, post-disaster budget reallocation processes, and fiscal risk modelling).

In 2020, the World Bank worked with the Department of Budget Management to prepare a **PER on disaster response, recovery, and reconstruction activities in the Philippines**. Despite the country's high exposure to natural disaster shocks and climate risks, no comprehensive review had been carried out for disaster-related public expenditures. The PER provided a better understanding of post-disaster expenditures derived from the country's array of national and local disaster funds, contingency funds, and agency budgets, with case studies on how these operated during periods of armed conflict, typhoons, and earthquakes. It found that one-third of post-disaster spending was financed through prearranged funding sources for disasters, many of which experienced execution bottlenecks. This gave rise to recommendations to streamline the procedures of the National Disaster Risk Reduction and Management (NDRRM) fund. The other two-thirds of spending was mainly financed through budget allocations and reallocations, which undermined allocative efficiency and diverted funding from its intended purpose. Moreover, the PER noted substantial challenges in the tracking of disaster spending, which prevented robust audit and oversight.

The PER exercise showed that despite having had a DRF strategy in place since 2015, many of its principles had not been fully operationalized through the PFM system. This finding led the Department of Budget Management to introduce a national DRBB framework in 2023, which identified incremental and iterative ways in which PFM systems and processes are configured to proactively manage disaster risk. Key reform priorities in the first year of implementation included mainstreaming risk into the budget preparation process through use of an updated catastrophe risk profile and incentivizing agencies to prioritize risk management. Other priorities included undertaking more strategic budgeting for the NDRRM fund, strengthening legislative oversight of DRM budgets and spending, and tracking disaster expenditures.

In 2019, the World Bank conducted **DRR-PFM assessments** in multiple countries in the Caribbean region, which is particularly vulnerable to natural disasters (like hurricanes, earthquakes, droughts, floods, and landslides) that often cause significant damage to life, property, and livelihoods. Despite these risks, many countries in the region still rely on conventional PFM systems that are not well suited to responding to disasters while also maintaining transparency and accountability. The reviews found that while countries had strengths in areas like funding for disaster response, there were inefficiencies and bottlenecks that hindered their ability to respond to natural disasters and maintain fiscal resilience. For example, many countries struggled with reviewing and scrutinizing expenses related to natural disasters, which led to increased risks of fraud, waste, and abuse. Emergency procurement procedures were also rare, and response agencies did not always consider gender in disaster response activities. Based on these and other findings, the World Bank provided follow-up technical and financial support to help countries like Jamaica, St. Lucia, and Haiti introduce rules and institutional arrangements that made their public financial systems more responsive to disaster risks.

Source: World Bank 2020, 2022a, 2022b; Ministry of Finance 2023.



3C

GOVERNANCE OF DRBB

A key objective of DRBB is anchoring decisions on disaster risk financing in the budget process; this aim implies certain governance aspects. First, it implies a vital role for central finance agencies in establishing disaster-sensitive PFM procedures. In the Philippines, for example, the Department of Budget and Management (DBM) is the lead institution for implementing DRBB. The anchoring also implies a certain regularity: the DBM is in the process of preparing its first DRBB framework, which includes a set of priority entry points and an action plan with measures to be implemented

through the budget process. Achievement of this plan will be reviewed each year, and the framework will be updated annually. Given the cross-sectoral nature of disaster resilience, this work cannot be done in isolation from those institutions and entities involved in setting and implementing DRM policy (including local governments, line ministries, the private sector, and nongovernmental organizations).

Adopting a whole-of-government approach to risk management promotes synergies across agencies and allows governments to identify and manage interdependent and interconnected disaster risks—but it can also pose substantial coordination challenges. In many countries, the authority of the central finance agency and the budget process can overcome these challenges. However, some countries have tried to address coordination challenges by mobilizing the seniority and convening power of other senior institutions in the center of government; this was the approach taken by the Cabinet Office in the UK (see box 13). These coordination efforts are unlikely to be led by a disaster agency, unless the agency has sufficient seniority and its mandate covers the full DRM spectrum, from disaster risk reduction to response and recovery (and not just response, as is usually the case).

Box 13: The institutional leadership of the resilience agenda in the UK

Following the experience with the COVID-19 pandemic, in 2022 the United Kingdom launched a UK Government Resilience Framework that set out its strategic approach to strengthening resilience through a whole-of-society approach. The framework defined the following institutional governance structure:

- A **Resilience Directorate in the Cabinet Office** was established to lead the UK government's work on resilience. It produces the National Security Risk Assessment and the National Risk Register. The response to larger-scale emergencies is headed by a **Lead Government Department** (LGD) and, in the most serious cases, is coordinated through the Cabinet Office Briefing Rooms (COBR) Unit.
- The Cabinet Office identifies LGDs for each risk. Their responsibilities include leading on risk identification, assessment, prevention, resilience, preparation, emergency response, and recovery. LGDs are expected to coordinate with other departments and devolved administrations in carrying out their responsibilities.
- The **UK Resilience Forum** brings together representatives of the public, private, and third sectors to improve communication and collaboration on risk, emergency preparedness, and crisis response and recovery.
- At the local level, **Local Resilience Forums** bring together first responders and local authorities to carry out risk assessments and coordinate preparedness and response measures.

The UK's setup is highly distributed—that is, there is no single agency responsible for emergencies or resilience. Instead, the UK seeks to mobilize the authority and convening power of the center of government to coordinate the dispersed actors. A 2023 audit concluded that "government has yet to set out what the respective roles of central government, local government, the devolved administrations, the private and voluntary sectors, and the public are, leading to uncertainty on what actions to take" (NAO 2023, 4).

In contrast, in Australia, the National Emergency Management Agency (NEMA) is the singular agency responsible for response, recovery, and resilience. The National Strategy for Disaster Resilience prescribes the respective roles and responsibilities of government, business, nongovernmental organizations, and individuals in relation to resilience.

Source: NAO 2021, 2023; NEMA 2011; World Bank team interviews with NAO staff and OBR staff, January 2023.

4c

RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER STUDY

Disasters have historically been treated as rare and unpredictable occurrences that require responses outside of everyday policy making. In fact, the frequency, intensity, and diversity of disasters are growing. The COVID-19 pandemic was a global reminder of this trend. Despite this changing reality, however, PFM systems are not configured to proactively embed DRF instruments and practices in the budget cycle, a limitation that increases the potential fiscal impacts on governments and people,

especially the most vulnerable, and also increases the chance that policy and political focus and action on DRF are not sustained.

Disaster risk–based budgeting offers governments a means of overcoming some of the binding constraints that impede PFM systems from adequately integrating disaster risk into policy and budget preparation, delivery, and oversight. DRBB has the potential to strengthen countries' financial resilience in the face of growing disaster risks. It also gives DRF instruments more strategic and consistent coverage and increased impact.

DRBB can be implemented through multiple entry points within the budget cycle, as indicated in section 2. Actions can be identified that allow countries to configure PFM systems so that they proactively address growing disaster risks and better protect current and future populations, the public budget, and economies from the impacts of disasters. The application of this approach will depend on a number of factors: the context, practices, and procedures that are in place, and the nature of risks the country faces, among others. Despite the need to tailor approaches and instruments to the context and to recognize that different types of disaster require different responses, a few general recommendations emerge for public finance actors seeking to manage disaster risk better.

4.1. Recommendations

Recommendation 1: Integrate disaster risk considerations into PFM systems across the budget cycle; appropriate entry points will differ based on binding constraints.

PFM systems do not regularly—or by default—take into account disaster risk factors in their pursuit of fiscal discipline, allocative efficiency, and technical efficiency. With growing disaster risks, central finance agencies need to start proactively and deliberately accounting for disaster concerns. They can do so by adjusting existing PFM systems to employ DRBB.

The most appropriate entry points for DRBB will depend on the binding constraints a government is trying to overcome to foster a more disaster-resilient economy. Therefore, the design of a targeted DRBB program should involve a process to identify bottlenecks and underlying causes, and to agree on feasible solutions and the stakeholders and steps to address them. This is in line with the World Bank's GovEnable approach, and is best carried out as a collaborative process with team members, including those involved in financing and delivering disaster preparedness and response. Box 14 below describes such a process in action in the Philippines.

Box 14: Bottleneck analysis being used to inform DRBB reform in the Philippines

In 2023, the Department of Budget and Management of the Government of the Philippines decided to develop a DRBB framework as part of an effort to reinvigorate implementation of the 2014 Disaster Risk Finance and Insurance Strategy and make the Philippines more financially resilient to disaster shocks.

To support this process, the World Bank provided DBM management and staff with a series of technical seminars on international practices around DRBB (which eventually gave rise to this report). This technical training, accompanied with disaster PER and other analyses, led the DBM management to select six areas of focus for their DRBB reforms: mainstreaming disaster risk into annual budgets, budgeting for DRF instruments, risk-informed public asset management, emergency procurement, strengthening legislative oversight of DRM budgets and spending, and tracking disaster expenditures.

For each of these areas, a Technical Working Group was put together composed of relevant units within DBM and other agencies, as appropriate. Each group's first task was to review the current financial and governance practices in relation to the area under its purview and discuss and document the bottlenecks and causal factors. Budget and spending data, as well as qualitative responses from DBM officials and the wider government, underpinned these assessments. Based on the findings, the groups prepared a prioritized action plan for the coming fiscal year and beyond, detailing measures to address these bottlenecks. These plans are consolidated to form the implementation of the DRBB framework, and the Technical Working Groups meet regularly to assess progress against them.

Source: World Bank.

While a country-led process of unpacking constraints and developing tailored responses is always preferable, some of the most common binding constraints (as presented in section 1.2) could be addressed by one or more of the intervention areas set out in section 2; Table 2 provides an indicative mapping. The approach and design of interventions will need to be informed by the political, economic, and social environment. However, the aim is for this mapping to be useful for governments as a prompt to consider potential interventions. For example, in contexts where disasters are considered unpredictable or uncertain events, quantifying disaster-related contingent liabilities can help bring clarity to expected costs, while audits or a disaster PER can help shed light on the consequences of being underprepared. Alternatively, where the main challenge is a lack of cross-sectoral coordination, the situation might be improved by costed disaster plans that are cascaded into sector plans and budgets, financial incentives for interagency collaboration on disaster resilience, and budget tagging systems.

Table 2: Mapping interventions to potential binding constraints

Binding constraint	Relevant DRBB entry points
Belief that disaster is uncertain and cannot be prepared for	• Integration of quantified disaster-related contingent liabilities into forecasts • Risk-informed public asset management • Auditing of disaster expenditure; scrutiny by PAC • In-depth evaluations • Disaster spending policy review tools (PER)
Inherent preference in budgeting systems to allocate scarce resources to known and confirmed expenditures rather than contingent liabilities	• Inclusion of disaster risk in the call circular • Financial incentives for cross-sector collaboration on disaster resilience • Budgeting for dedicated DRF instruments • Risk-informed public asset management
Complexity of DRF solutions	• Budgeting for dedicated DRF instruments • Embedding of DRF strategy implementation in the budget process • Disaster spending policy review tools (DRF diagnostic) • Development of legislative capacity on DRF
Ease of access to ex post financing	• Risk-informed budget reallocation processes • Disaster spending policy review tools (PER, DRF diagnostic)
Visibility and positive publicity gained from tangible disaster response vs. limited credit for preparation/risk reduction	• Development of legislative capacity on DRF • Disaster budget tagging systems • Auditing of disaster expenditure; scrutiny by PAC • In-depth evaluations • Disaster spending policy review tools (PER, DRF diagnostic)
Lower expectations for performance and propriety in disaster response scenarios ; possible relaxation of controls arising from expedited procedures	• Development of legislative capacity on DRF • Auditing of disaster expenditure; scrutiny by PAC • In-depth evaluations • Emergency procurement • Streamlining execution of disaster response programs • Post-disaster control functions • Strengthening of emergency budget approvals • Disaster spending policy review tools (DRR-PFM) • Use of technology to facilitate faster processing of transactions without compromising controls
Institutional coordination challenges posed by DRF as a cross-cutting issue	• Disaster risk in the call circular • Financial incentives for cross-sector collaboration on disaster resilience • Cascading of costed disaster plans into sector plans and budgets • Disaster budget tagging systems

Source: World Bank.
Note: DRF = disaster risk finance; DRR-PFM = Disaster Resilient and Responsive Public Financial Management; PAC = public accounts committee; PER = Public Expenditure Review.

Besides binding constraints, the preexisting PFM system will also determine appropriate entry points. For instance, the orientation of a budget structure toward outputs (as in program budgeting) is a prerequisite for disaster budget tagging.

The examples of DRBB reforms in this report were not achieved with a single reform directive, but rather in an iterative manner. Efforts to reform PFM systems to include DRBB should aim to review progress annually and to achieve higher standards and more ambitious reforms over time as capacity develops and approaches are refined.

Recommendation 2: Adopt a whole-of-government approach to the financial management of disaster risks, led by the center of government (typically, a central finance agency).

A whole-of-government approach helps ensure that the political will needed to prioritize DRBB is present and that the spending decisions of a disparate set of actors are aligned. On a functional level, this approach also enables more effective interagency collaboration and coordination for critical tasks such as risk-informed public asset management. Mainstreaming of strategic plans into sectoral plans and annual budgets is a key part of this process because it ensures that broader government practices support disaster resilience. While DRF reforms are usually led by central finance agencies, implementation of DRBB requires cross-agency collaboration.

Recommendation 3: Support a learning environment focused on disaster resilience, DRBB, and DRF to ensure continual improvement in these areas.

A learning environment could be supported through domestic processes—for example, audit reports and government or legislative inquiries. Countries should regularly review their approach to configuring PFM systems so that they proactively address disaster risks—for example, by updating the DRBB stock-take and action plan. Bilateral and international learning can also be supported through peer-learning and training programs. It could also be supported through the use of policy review tools designed to aid detailed learning, such as disaster PERs, DRF diagnostics, or the DRR-PFM assessment tool. This learning environment should rest on a solid base of evidence related to DRBB implementation, which government could begin to develop by creating and maintaining an accurate register of contingent liabilities. Budget tagging would provide up-to-date spending information to allow quick and effective decision-making. In addition, building of capacities and understanding across government and public bodies in relation to DRBB and oversight of DRF would help actors interpret and apply evidence for better policy design, implementation, and oversight.

Recommendation 4: Prepare PFM systems before a disaster happens.

Rather than scrambling to adapt to new realities following a shock, governments should understand how systems will or will not adjust to a shock before it occurs. Using a DRBB approach to take stock of challenges helps governments identify actions that can be implemented well in advance of a disaster. For instance:

- Putting a system of risk-informed budget reallocations in place will help ensure a measured, evidence-based, and more predictable approach to reconfiguring the budget after a shock. This step could include the development of protocols, guidance documents, and training.
- Developing rolling manuals for emergency procurement and real-time audit guidelines can help improve the efficiency and timeliness of post-disaster disbursement and maximize effective use of public funds.
- Assessing contingent liabilities in advance of a disaster event can help a government determine its risk appetite and make a policy decision about how much to allocate to disaster funds or how much to transfer through insurance.
- Developing ex ante guidance on how all transactions must be recorded, and automating the publication of data and reports wherever possible, can help boost transparency of public spending in disaster situations where there is pressure to spend more, and more quickly.[24]

24. See NAO (2024) for more suggestions in this area.

4.2. Areas for further study

As an overview paper, this report identifies some of the key challenges involved in promoting disaster risk–informed PFM, as well as some approaches and instruments for addressing these challenges. To strengthen governments' understanding, application, and adaptation of some of the practices outlined above, more in-depth learning on DRBB is recommended. This section highlights some key areas that would benefit from further research, based on the authors' assessment of gaps in the existing literature/evidence base and on the limits in the current paper's scope.

Drivers and challenges for DRBB

Political economy of disaster spending. Political interest in and commitment to financing disasters (through DRF and DRBB) constitute a foundational, ongoing, and constantly evolving challenge. It would be useful to explore more deeply the political drivers of DRBB and DRF as well as obstacles to them, in part to achieve a more nuanced understanding of how political, economic, historical, and societal factors inform the commitment to proactive and sustained financing of disaster risk. This effort would take into account how political economy factors vary for different types of disaster (e.g., slow versus rapid onset, climatological versus non-climatological hazards) and in contexts with different levels of economic development. This understanding, in turn, would inform the design of proposed DRBB interventions and approaches to make them as politically relevant and effective as possible.

Operationalization and sustaining of DRF strategies. Many countries may now be considering revising or updating their DRF strategies. It would therefore be useful to study the extent to which

first-generation DRF strategies were incorporated into government plans and budgets and ultimately implemented, including sustained placement of DRF instruments. It would also be useful to document any lessons learned.

Broadening the scope of DRBB

Subnational DRBB. The scope of this review did not allow for an in-depth consideration of the factors that shape DRBB at a subnational level. As disasters are often not felt equally across a state and often affect localities in particular ways, it will be important to further study how DRBB can be configured to best support citizens through subnational government. Such a study would include the relationship between national and subnational PFM systems and governance processes and could focus on cost-sharing arrangements, the role of intergovernmental fiscal transfers and subnational budgeting/fiscal rules, and processes for subnational (spatial) reallocation after disasters. Like the current review, it would draw on examples and experiences of DRBB across the world.

DRBB beyond general government expenditure concerns. The scope of this review is limited to general government (particularly central government) and the expenditure-side tools it can use to strengthen financial resilience to disasters. Much more could be said on the role of debt management and revenue policy in this task. In addition, expanding the scope of DRBB to encompass the wider public sector, including central banks and parastatals, would be of interest, as this perspective opens up many useful opportunities for coping mechanisms and reallocating resources after disasters.

DRBB interventions: Deeper dives into areas less well covered in existing literature

Design of and budgeting for reserve funds. Reserve funds can be a very effective DRF instrument. However, much more could be learned in several areas: how reserve funds are formed and maintained (especially in resource-constrained contexts); how reserve funds are integrated into broader DRBB and PFM systems; how funding targets are met and protected from political interference (and broader political economy issues); and how the optimal balance between reserve funds and other DRF instruments can be achieved within a broader risk-layering approach.

Budget tagging. This is a relatively recent innovation (in the disaster field), and there is more to be learned about its use, such as the implications of disaster-related budget tagging for interagency coordination. It would also be desirable to have more technical knowledge on harmonization of this effort with other tagging initiatives, such as climate budget tagging.

Accountability and learning in DRBB

Budget approval. Research to date suggests that strengthening ex ante disaster-related budget approval processes could facilitate greater transparency, use of evidence, and accountability. Further research on challenges facing this effort—and efforts to transform improvised processes into considered and formalized ones—would be valuable. Further study in this area would distill lessons on emergency budget approvals in developed, emerging, and developing economies (beyond those documented from COVID-19) and would also explore issues related to budget approvals for off-budget funds.

Audit and accountability. Further research on effective design and implementation of real-time audits would strengthen disaster response and improve financing of the response as it progresses. Study in this area would also consider audit trails in more detail, and the potential uses of digital currency and blockchain technology. Deeper understanding of how parliaments can build or access knowledge about disaster risk management and financing would also support greater accountability.

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