

5 Towards a framework for action

This final chapter provides a strategic framework for government action for the financial management of climate-related risks. At national level, it proceeds from the assessment and mitigation of climate-related fiscal risks, to developing multipronged government financial strategies, which take into account the extent of budgetary resources and financing capacities. At the international level, it emphasises the importance of integrated strategies to promote global climate financial resilience through coordinated donor action, particularly in support of economies facing high level of risks and possessing limited resources to manage them.

The aim of this chapter, which builds on the previous two substantive chapters, is to provide a framework for government action for the financial management of climate-related risks, serving to support enhanced decision-making at the national and international levels, with proposed actions and guidance, particularly with a view to supporting governments in emerging market and developing economies facing budgetary and financing constraints. The framework proceeds in a step-wise fashion:

- At the *national level*, from the assessment of climate-related fiscal risks due to adverse events, to the mitigation of losses from these climate hazard events and their implications for governments, followed by the development of appropriate governmental financial strategies, which take into consideration the extent of budgetary resources and financing capacities; and,
- At the *international level*, from encouraging integrated strategies that reinforce domestic actions through multiple channels, to promoting coordinated donor action, with the overarching goal of promoting climate financial resilience, particularly for economies facing a high level of risks yet possessing limited resources to manage them.

The framework provides a relevant action oriented toolbox to support decision making. It has been informed by the *OECD Recommendation on Disaster risk Financing Strategies*, the *OECD Recommendation on Budgetary Governance*, and the *OECD Recommendation on the Governance of Critical Risks*. It also benefitted from the OECD Development Assistance Committee Declaration on a new approach to align development co-operation with the goals of the Paris Agreement.

5.1. Strengthening the financial management of climate-related risks

5.1.1. Identify, assess and report on climate-related risks and their financial implications for government

Identifying and assessing climate-related risks, financial vulnerabilities, and financial implications for government

Central governments face a number of costs related to relief, recovery and reconstruction in the aftermath of climate-related hazards. These include costs related to responding to the immediate needs of those impacted by the event and costs related to supporting recovery and reconstruction, including losses and damages incurred by central government entities and potentially losses and damages incurred by subnational governments, and related public assets as well as businesses and households. This has multiple implications for governments, including for public finances. Fiscal risk assessment involves an assessment of the potential for these costs to materialise which can inform budgeting and public financial management strategies. This has to be based on the nature and potential scale of impact of the climate hazard(s), the exposure of communities and businesses and their assets to those hazard(s), and their vulnerability to impacts (e.g. structural resilience).

Assessing fiscal risks in a forward-looking perspective should take into account the potential for climate change to lead to increasing losses and damages in the future, including for central government. National climate risk assessments will need to be more explicitly linked to fiscal risk assessment frameworks, through greater whole of government coordination. This will be necessary to ensure that the fiscal impacts of climate hazards and extreme weather events are comprehensively identified and quantified. This assessment of fiscal risks can either be done by governments directly, or by independent fiscal institutions, or fiscal councils, working at arms' length from government.

In estimating climate-related fiscal risks, there is a need to distinguish between explicit and implicit contingent liabilities arising from such risks. Some contingent liabilities are clearly within the responsibility of central governments, such as losses and damages incurred to central government operations (and assets). Central governments may also have a clear responsibility to assume some (or all) of the losses

and damages incurred by subnational governments based on an established cost-sharing arrangement or a clear commitment to provide a set amount of compensation or financial support to impacted business or households.

Implicit liabilities may arise from the expectation – among subnational governments, businesses or households – of central government financial assistance (potentially based on the response to previous events) or as a result of financial vulnerabilities that emerge as a result of a climate event. The political pressures are often such that governments are placed in a position where they have to address unmet needs. The identification of financial vulnerabilities within different segments of society and the economy is therefore a critical component to understanding the fiscal implications as national governments are likely to face demands to respond to these vulnerabilities in the aftermath of a climate-related catastrophe. Identifying financial vulnerabilities requires an understanding of both the potential risk of losses and damages (determined, as mentioned earlier, by the nature and scale of the risk, exposure or who is expected to be affected by losses and damages in the event of a catastrophe (households, businesses or local, regional governments), and their vulnerability to damage and losses), and their financial capacity to absorb the potential losses and damages that they may face, for instance through savings, access to borrowing, or insurance coverage (where acquired).¹

An assessment of the financial vulnerabilities should take into account the potential impact of climate change in the future. The financial vulnerabilities of households, businesses and subnational governments may increase in the context of climate change, for example through increased variability of major climate patterns. This may result in both potential increases in losses and damages as well as changes in their financial capacity to absorb those losses and damages (e.g. through debt financing or insurance). For instance, the cost of debt financing for sub-national governments and businesses could increase if lenders integrate concerns about climate risk into credit ratings and borrowing costs (or if such concerns are integrated into the credit ratings and borrowing costs of central government).² There may also be reductions in the availability (or increases in the cost) of insurance coverage in the future if increasing losses and damages lead to higher (and potentially unaffordable) premiums or insurance coverage withdrawals.³ An increase in borrowing costs or a reduction in insurance coverage would reduce the capacity of subnational governments, businesses and/or households to absorb losses and increase financial vulnerabilities and potential (central) government fiscal risks.

Financial vulnerabilities can be mitigated through social protection and direct assistance to citizens, financial assistance to business, and transfers to (or cost-sharing with) sub-national levels of government which are critical to reducing the economic and social hardships that can result from climate-related catastrophes. A policy and legal framework that clearly sets out central government responsibility for the financing of post-disaster response, recovery and reconstruction will help to identify explicit contingent liabilities and to reduce the scope for implicit vulnerabilities (OECD and World Bank, 2019_[1]). This includes, first, clear and explicit conditions (e.g. eligibility criteria) to reimburse disaster-related costs incurred by subnational level and second, commitment ceilings. According to the *OECD Recommendation on the Governance of Critical Risks*, governments can plan for contingent liabilities by “developing rules for compensating losses that are clearly spelled out at all levels in advance of emergencies to the extent that this is feasible to achieve cost effective compensation mechanisms” (OECD, 2014_[2]). The establishment of operational procedures to ensure the timely distribution of financial support to those in need is critical for reducing the level of hardship and supporting a quicker recovery.

There are two main approaches to estimating potential fiscal risks due to climate-related hazards: direct estimation (based on historical losses) and estimation via probabilistic modelling (OECD and World Bank, 2019_[1]). The first method consists in deriving estimates from historical data on the cost of past events for governments. Such information may be obtained from data repositories, payouts from relief funds, disclosed data on the spending to respond to hazards and disasters as well as from insurance programmes and companies. Information on the consequences of past hazards is important, especially for understanding how hazards interact with local vulnerability of exposed communities and assets; the past

is however not a perfect proxy of the future, in particular in a changing climate. The second method entails estimating the costs of climate losses and damages via a modelling of losses based on the probability of a catastrophe. Such methods can complement estimates based on past events but also serve to estimate the cost of extreme events that have not previously occurred. Further, the indirect or second-order effects of climate hazards should also be taken into account and need to be properly measured. (OECD, 2017^[3]). Indirect impacts are more difficult to measure and yet may outweigh the direct costs of hazards. In assessing the magnitude of these risks, countries should evaluate average annual losses and probable maximum losses.

A variety of stakeholders and expert bodies can be involved in assessing climate-related fiscal risks. Economic and financial forecasters could work closely with climate change councils and independent fiscal institutions, which have begun preparing green analysis that could be readily adapted and incorporated into official planning frameworks (Cameron, Lelong and von Trapp, 2022^[4]). For example, the UK Office for Budget Responsibility makes its climate-related fiscal scenarios by drawing from emissions mitigation scenarios projections by the Climate Change Committee (Office for Budget Responsibility, 2021^[5]). The Ontario's FAO collaborated with the Canadian Centre for Climate Services that provided regional projections of climate indicators identified by an engineering firm, WSP, with expertise in public infrastructure and climate change. The (re)insurance sector, including intermediaries, (re)insurance companies, insurance associations and specialised catastrophe modelling firms, have developed sophisticated tools for analysing financial risks from climate-related events which could provide risk insights to support governments in the identification and assessment of climate risks.

Long-term fiscal sustainability analyses provide another tool for assessing potential climate risks to public finances. These analyses, though not forecasts per se, consist of long-term projections of baseline expenditures (under the assumption of no change to existing policies). They are usually aimed at capturing the trend impact of demographics. Scenario analyses are a useful type of long-term fiscal sustainability assessment to examine fiscal adjustment paths under various climate targets. These analyses can serve as a benchmark for policymakers regarding the economic and fiscal impacts of mitigation and adaptation measures.

Governments should reinforce their capacity to account for such losses and damages, given the possibility of increased losses in the future related to more severe and frequent extreme weather events. In estimating adaptation costs, governments should also agree on baseline estimates of temperature increases at the national level. Such estimates in turn rely both on assumptions of government policies towards emission reductions as well as countries' climate behaviour on the global scene. Long-term fiscal assessments can seek to capture the fiscal consequences of physical risks as well as adaptation costs from climate change.

For instance, the European Commission's 2021 Fiscal Sustainability Report presents the results of a fiscal stress test of the impact of extreme weather events on several European countries. By relying on data on past impacts of extreme weather events, the methodology (Box 5.1) highlights the usefulness of recording such data. As mentioned in Chapter 2, in developing countries, data availability is often challenging (PARIS21, 2022^[6]). Making the impact of climate change on public finances transparent, as has for instance been done with the EU's Fiscal Sustainability Report, encourages public stakeholders to act. Uncertainty can indeed decrease investment in risk reduction.

Box 5.1. The European Commission's Fiscal Stress Test

In its latest Fiscal Sustainability Report, the European Commission performed a stress test of the fiscal impact of acute physical risks posed by extreme weather events on 13 European countries deemed particularly exposed to such risks.

The stress test consisted of estimating the deviation from the European Commission's baseline debt-to-GDP ratio forecasts for the next 10 years in the event that a past extreme event reoccurs. It is augmented by the effect of global warming under a 1°C and a 2°C scenario.

The stress test distinguishes a direct effect on the fiscal balance and an indirect effect. The direct impact is estimated by first computing country-specific exposure to extreme events (using data on past uninsured losses). To this is added the expected increase in economic losses from extreme events due to global warming levels (measured in quantitative climate risk assessments). The indirect impact captures the macroeconomic shock on GDP (growth and level).

The 13 countries for which the test is performed are Spain, Belgium, Romania, Austria, France, Italy, the Netherlands, Greece, Hungary, Germany, Poland, Czech Republic and Portugal. Spain and Czech Republic are found to be the most exposed: under a 2°C scenario their debt-to-GDP ratio would increase by 5.2 and 4.7 percentage points of GDP, respectively, compared to the baseline.

Source: (European Commission, 2022^[71])

Understanding the full potential for central government losses and damages, clarifying explicit liabilities through established financial support programmes and social protection, and minimising potential implicit liabilities that could arise as a result of emerging unforeseen financial vulnerabilities will provide a clearer picture of the amount of the funding that governments will need to respond to climate-related risks. They will help build clearer and more resilient public financial management frameworks.

Reporting climate-related fiscal risks to promote transparency in public financial management

In turn, disclosing plans for managing public finance exposures to catastrophic climate-related events ensures accountability from civil society and lawmakers on the management of climate-related risks. Transparency can generate continued pressure on governments to identify, quantify and plan for these risks and ultimately ensure robust public financial management of climate risks. Likewise, disclosure can strengthen confidence from financial markets that countries can manage the impact of chronic and acute climate change (e.g. extreme weather events). High levels of public debt, high vulnerability to climate change and/or limited access to international capital markets for public borrowing make market confidence particularly important. As credit rating agencies increasingly examine countries' exposure to climate and catastrophe risks⁴, the disclosure of funding and financial management plans could have a positive impact on countries' borrowing costs.

Disclosure practices can come in varying forms. Ministries of Finance may publish strategies to manage contingent liabilities including climate-related ones outside the budget process. Countries have for example included information on funding plans into risk assessments (e.g. Hungary) or longer-term statements on national planning (e.g. Lithuania). Strategies can also be integrated in the budget process, often through so-called Fiscal Risks Reports, for example as an annex of the budget law. There may be regulations that require line ministries to report contingent liabilities to Ministries of Finance. The OECD Recommendation on the Governance of Critical Risks (OECD, 2014^[21]) and the Recommendation on Budgetary Governance (OECD, 2015^[81]) respectively state that, in the context of the budget process, countries should disclose

disaster-related contingent liabilities and report on the management of fiscal risks. In addition, the EU national fiscal frameworks Directive 2011/85 asks EU Member States to list key contingent liabilities in sufficiently broad terms to include climate-related ones.

For example, climate change has various entries in the New Zealand Treasury's reporting of fiscal risks. In New Zealand, budget reports for example disclose how the impact of natural and climate hazards on physical assets and public services is managed: "the Government generally relies on asset management, including built-in redundancies (e.g. in network capacities), and its ability to reallocate or repurpose assets rather than risk transfer instruments such as insurance." (New Zealand Treasury, 2021^[9]). In addition, the Treasury categorised its National Adaptation Plan as a fiscal risk given that it is likely to generate new expenditures. The country is currently developing National Adaptation Plan in response to the risks identified the National Climate Change Risk Assessment. The Philippines publish their annual Fiscal Risks Statement, which recognises that the country is exposed and vulnerable to climate risks. The document gives details on the implications of climate risks, such as typhoons and tropical cyclones, but also slow-onset events, as well as on how they are managed (Department of Budget and Management, 2022^[10]).

5.1.2. Mitigate financial losses from climate-related risks and their implications for governments

Promoting, investing and financing risk prevention, risk reduction and adaptation to reduce exposure and vulnerability

A strategy for risk prevention and reduction and adaptation, efficiently mixing preventive physical investments and non-structural measures, is an important step to reduce vulnerabilities. This should be part of a multipronged approach to help governments address climate related losses and damages. Increasing investment in risk reduction and climate adaptation can make an important contribution to reducing losses and damages from climate events and the potential fiscal risks related to climate change (see Box 5.3 for the role of mitigation and Box 5.2 for how risk reduction affects the cost of capital). According to the *OECD Recommendation on the Governance of Critical Risks*, an optimal disaster risk prevention and mitigation strategy efficiently combines structural with non-structural measures (OECD, 2014^[2]). Structural measures include major physical investments, such as building dykes, whereas non-structural measures may involve land-use planning, dissemination of information materials on do's and don'ts at the time of disaster. Climate, disaster and fiscal risk assessments should be used to determine priorities for structural and non-structural preventive investments.

Since resources are scarce, alternatives for risk reduction investment should be evaluated in a transparent and comparable manner. Data collection helps identify climate risks, as discussed in Chapter 2, and thus can highlight a few possible priorities for such investments. Depending on the context, cost-benefit analysis (CBA) can usefully guide decisions. Such analyses estimate the advantages and disadvantages of different options, usually in monetary terms. This helps determine which path provides the most benefits net of costs. By their nature, CBAs are useful for illustrating trade-offs between different investments (OECD, 2018^[11]), even if they face limitations regarding some climate change investments (e.g. the frequency and intensity of future extreme weather events is uncertain).

When not every impact can be monetised, a more appropriate approach may be to compare various plans to ensure the project is carried out at least cost. Typically, a cost-effectiveness analysis is easier to carry out than a CBA because it does not require that every aspect be monetised (e.g. impact of uncertain catastrophic events) (OECD, 2007^[12]). Similar to a CBA, the costs are assessed in monetary terms. However, usually only direct costs are considered. If the impact can be measured without being monetised, the policies might be characterised by their cost-effectiveness ratio (OECD, 2007^[12]; Tuominen et al., 2015^[13]). Any decision-making process regarding climate change should be participatory to ensure consideration of diverse perspectives and consider possible costs and benefits across all affected

populations. Given the future impact of climate change-related risks, it is important to apply a long time horizon when assessing the benefits of resilience. This makes it important to have a public sector discount rate that values the true resilience benefits over a sufficiently long period. In addition, when evaluating public investments with long-term benefits, it is crucial to assess their whole-of-life costs, which includes assessing their capital, operational and decommissioning expenditures over the full, multi-decade life of the investment. This is key to understanding the true climate finance-related liability of building a particular investment in a certain location.

Box 5.2. Risk reduction and the cost of capital

Risk reduction and adaptation could be a good investment from a purely fiscal point of view. Some extreme weather events may lead to increase in government spending years after they hit (Deryugina, 2017^[14]). Accordingly, countries (especially low-income ones) which are vulnerable to climate change are more susceptible to sovereign defaults (Cevik and Jalles, 2021^[15]) and have a lower credit rating (Cevik and Jalles, 2020^[16]). Financial markets also recognize and price climate vulnerability, as bond yields are lower for less vulnerable and more resilient countries (Cevik and Jalles, 2022^[17]; Beirne, Renzhi and Volz, 2021^[18]). Thus, more resilient countries can access capital at a cheaper price from the financial markets. This in turn, affects the cost at which the private sector within the country, can access capital (Arteta and Hale, 2008^[19]; Corsetti et al., 2013^[20]).

When investing in risk reduction, it is crucial to consider the incentives it may provide, to avoid increasing risks in the end (maladaptation). For example, the cost of building a sea wall depends on the length – rather than the value of assets – of the exposed coastline. This suggests the need to protect only high-value assets in a limited, well-defined area; low-value assets, or assets spread over a large, exposed area may justify alternative approaches. Such protection then creates the incentive to relocate or concentrate assets in the protected area, thereby increasing exposure should the sea wall break (Gibbs, 2015^[21]). Where possible, new investment should be directed at infrastructure proposed to be built in low-risk areas, to minimise any future climate-related losses and financial liability.

Box 5.3. Role of climate mitigation in risk reduction

In risk reduction, the role of climate mitigation should also be underlined. In 2015, countries agreed to “hold global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels” (Paris Agreement, 2015^[22]). In order to achieve this globally-agreed temperature goal, countries have submitted Nationally Determined Contributions (NDCs) in which they lay out their plans to reduce GHG emissions. Global collective action on GHG emissions however still falls far short from what is needed to meet the temperature goal in the Paris Agreement and to avoid the most dangerous impacts of climate change. Indeed, even if accounting for pledges made at COP26 in Glasgow in 2021, current levels of ambition in NDCs would lead to a temperature increase of 2.4°C by the end of the century (CAT, 2021^[23]).

While not the focus of the report, mitigation is possibly the only way to reduce the risks of crossing some tipping points in the climate system and of some slow-onset events such as severe sea-level rise, while having the potential to decrease the frequency and severity of hazards (OECD, 2021^[24]). It is without question that mitigation of GHG gases needs to be ramped up worldwide with countries putting forward clear mitigation plans, considering all sectors of the economy, including carbon-intensive and hard-to-abate sectors. While governments often see mitigation as a cost in the present, with benefits materialising in the future, this is a misguided view. Mitigation actions could contribute significantly to important improvements in human well-being in relation to the Sustainable Development Goals. By integrating climate action and action on sustainable development, governments can realise early benefits from health improvements and accessibility, as well as job creation (OECD, 2021^[25]).

Governments should consider integrating climate risks into public investment management systems as it can make an important contribution to climate change adaptation. Preventive investments are aimed not only at directly mitigating climate losses and damages (e.g. higher barriers against larger floods or higher sea levels) but also at making “regular” infrastructure more resilient (e.g. making drainage systems and telecom systems more resistant to wildfires and floods). Climate-resilient public investments are also relevant in the context of post-disaster reconstruction efforts. It enables countries to “build back better” and provides resilience to shocks. Climate risk-sensitive public investments make financial sense as they enable governments to increase the efficiency of public spending, while reducing the future costs attributable to climate change.

This process of operating, maintaining, upgrading and expanding assets throughout their lifecycle (known as asset management) allows for the cost-effective provision of the desired level of service (World Bank, 2014^[26]). Good infrastructure asset management can reduce life-cycle costs, enhance service levels, improve transparency, lower operational and legal risks and allow for performance tracking and monitoring, with positive implications in terms of resilience to climate change. Better financial management of physical assets is critical because public infrastructure often represents the largest physical asset in any country (World Bank, 2014^[26]). As such, infrastructure is not only key in delivering services in modern societies, but it is also particularly exposed to climate risks. For example, in the Philippines—a country highly exposed to climate related risks—the Government released its national asset management plan (NAMP) in early 2022. The plan is designed to help the government realise value from its assets while achieving its strategic objectives by supporting evidence-based service delivery (GOV.PH, 2022^[27]).

Risk analysis should be integrated in all phases of the infrastructure project cycle. In the project selection phase, exposure and vulnerability to climate hazards should also be embedded in the decision criteria. The project appraisal stage can for example include climate risk screening or the quantification of climate-related risks in the project economic analysis. Countries should also consider integrating climate-related risks in the reporting and management public infrastructure assets. (OECD, 2021^[28]). Finally, climate

change exposure should be considered in estimating the maintenance needs of public assets (Italian G20 Presidency, 2021^[29]). For the specifications required for risk analysis to be effectively managed, an entity should be responsible for standardising disaster risk analysis methodologies and climate-sensitive construction regulation (e.g. building codes) should be developed. Costa Rica has demonstrated best practices in the integration of climate-related risk in public investment management (Box 5.4).

The integration of physical climate risks is one aspect, among others, of the mainstreaming of climate change in the public investment management process. Other aspects include quantifying greenhouse gas-related externalities in project evaluation or aligning the project prioritisation process with national decarbonisation plans. These other aspects are however not covered in this report.

Box 5.4. Costa Rica's climate-sensitive National Public Investment System

As part of the country's 2015-2018 National Development Plan, the Costa Rican Ministry of Economic Policy and National Planning (MIDEPLAN) has strengthened its capacities in climate and disaster risk management, notably in public investment projects. In collaboration with other ministries, the MIDEPLAN has developed tools, presented below, to incorporate climate change considerations, including climate risks, throughout the framework of the National Public Investment System. The two main goals are to increase the resilience of public infrastructure and reduce the cost of post-disaster reconstruction.

The country developed a Methodological Guide for the Identification, Preparation, and Evaluation of Public Investment Projects. The guide incorporates climate risk into the project cycle by quantifying risks to projects, examining paths for risk reduction alternatives, performing cost-benefit analysis of climate change mitigation, among other things. A methodology was also developed to assess risk from natural hazards in the project planning stage. The country formulated a regulation that required institutions in charge of the implementation of public infrastructure projects to perform multi-hazard assessments that include existing scenarios and forecasts for climate change and climate variability.

Source: (Delgado, Eguino and Pereira, 2021^[30])

An additional measure may involve leveraging targeted rates and levies, aimed at consumers as a charge on existing infrastructure that may be subject to future risk, such as transport routes, water infrastructure and electricity generation and distribution. Countries can then hypothecate and reinvest this revenue back in to future resilience activities to strengthen risk prevention.

The increasing interest of investors in ESG-related assets may offer governments an opportunity to access more affordable debt financing for investment in adaptation. Efforts to further build consistency in terms of minimum reporting requirements and the criteria for what constitutes "green spending" as well as the establishment of agreed mechanisms for addressing situations where issuers do not allocate funds in accordance with these criteria would facilitate the issuance process and build more liquid markets for ESG-labelled bonds (OECD, 2022^[31]).

Protecting households and businesses through insurance and access to credit

Higher levels of insurance coverage of losses and damages incurred by households and businesses should reduce fiscal risks by limiting the need (and demand) for financial assistance and compensation from the government as households and businesses will have access to funding to absorb (at least a portion of) the losses and damages they incur. In addition to reducing fiscal risks, supporting the contribution of insurance to absorbing climate losses and damages can have important benefits for risk

assessment and risk reduction (see Box 5.5). Overall, these can help to dampen macro-shocks related to disasters, thus helping to stabilise government balance sheets and reducing the risk of a gap in finances.

Box 5.5. Risk management benefits of enhancing the contribution of insurance in covering climate risks

Broad insurance market involvement in providing coverage for climate-related perils should increase demand for the risk analytical tools necessary to underwrite and price climate risks, particularly catastrophe models. Catastrophe models apply catalogues of potential hazard events (past and hypothetical) to building and infrastructure inventories and take into account their construction characteristics and structural vulnerabilities to develop probabilistic estimates of the potential financial impacts of catastrophe events. The development of catastrophe models by specialised modelling firms, (re)insurance companies and intermediaries is primarily driven by financial considerations – models are developed for countries and perils where insurance or reinsurance companies have assumed significant exposure. Perils or countries where there is limited private insurance coverage – or where regulation limits the application of risk-based pricing – are often not well-covered by private sector catastrophe models.

Source: (OECD, 2021^[32]), (OECD, 2021^[33]).

However, a significant share of losses and damages from climate-related catastrophes are uninsured in developing countries as well as in many high-income countries. Limited insurance coverage of catastrophe losses and damages is often due to factors that lead to a gap between the cost of insurance coverage and the amount that households and/or businesses are willing to pay for that coverage (which is likely driven, at least in part, by low levels of awareness among households and businesses of climate risks, see Box 5.6) (OECD, 2021^[32]). It may also be driven by low levels of property insurance penetration more generally (see Box 5.7).

Box 5.6. Building climate risk awareness among households and businesses

Communication about climate risks should encourage households and businesses to manage them, including through the use of insurance. Businesses and households often lack the capacity to identify the risks they might face in the future. Thus, raising awareness to potential climate-related hazards is crucial in reducing and managing the exposure and vulnerability of private actors to those hazards. Perceptions and expectations about risks are among the most important drivers of managing those risks. Households and business tend to change their behaviour when informed about the climate risks they face (Halady and Rao, 2010^[34]; Andre et al., 2021^[35]).

Governments and the insurance sector should develop initiatives to raise awareness of climate risks among households and businesses, including their responsibility for managing those risks and the scope of financial protection that is available from insurance markets. Communications initiatives should take into account the behavioural biases of individuals and groups, such as the tendency to underestimate risk as well as the level of financial literacy and inclusion. Mandated disclosure of climate risks by companies can play an important role in raising climate risk awareness among businesses and provide incentives to manage those risks.

Governments should evaluate the overall availability and affordability of insurance coverage for all of the potential climate-related risks that could result in losses and damages for households and businesses, with a focus on identifying potential market failures, such as moral hazard and adverse selection, and possible approaches to addressing those failures (OECD, 2012^[36]). In particular, it is critical to identify any segments of society that are uninsured and financially vulnerable (e.g. low income, residents of certain regions, businesses of a certain size or active in specific sectors) and assess the reasons why they are uninsured.

Insurance regulators and supervisors can also support the availability of affordable insurance for catastrophe risks by allowing risk transfer by domestic insurers to global reinsurance and capital markets. These markets play a crucial role in providing financial capacity and diversifying catastrophe risks internationally which should reduce the cost of providing coverage to households and businesses and also provide a source of funding for recovery.⁵ Despite these potential benefits, a number of countries impose various restrictions on the transfer of risk to reinsurance markets (and, particularly, for cross-border risk transfer) which may be concentrating risk domestically and limiting the ability of domestic insurance companies and their policyholders to fully capitalise on the benefits of risk transfer to reinsurance and capital markets.

Insurance regulators and supervisors can encourage the availability and take-up of insurance coverage by requiring insurance companies to make coverage available for climate perils (i.e. mandatory offer), automatically including coverage for climate perils in standard property insurance coverage (i.e. automatic inclusion) and/or ensuring that households and businesses are aware of the consequences of not acquiring insurance and required to explicitly opt-out of acquiring such coverage (mandatory opt-out). Alternatively, banking regulators can require banks to ensure that their borrowers have insurance coverage for relevant climate perils for properties with outstanding mortgages. All of these approaches tend to lead to higher take-up of insurance coverage for catastrophe perils and lower levels of uninsured losses – both in developed and developing economies.⁶

However, requiring insurance companies to offer insurance coverage for climate perils – or requiring households and businesses to purchase insurance coverage for climate perils – can have adverse consequences. Households and businesses facing high levels of exposure to climate hazards could face unaffordable premiums and, as a result, might choose not to purchase any insurance coverage at all if forced to acquire unaffordable coverage for climate perils. Similarly, insurance companies may choose not

to make any property insurance coverage available in areas that are highly exposed to one (or many) climate peril(s) if they are required to include or offer coverage for that (or those) peril(s). Targeted investments in risk reduction and adaptation can support the availability and affordability of insurance coverage in communities that are highly exposed to climate risks. An assessment of insurance availability and affordability can help identify where such investments are most needed.

Catastrophe risk insurance programmes may offer a potential solution for supporting the availability of coverage for high-risk households and businesses. These programmes can ensure that insurance coverage for climate perils is available to highly-exposed (or all) households and/businesses and support affordability by leveraging diversification benefits as well as (potentially) through subsidisation - either between policyholders (cross-subsidisation) or at the programme-level (although significant subsidisation can blunt risk signals and potentially lead to fiscal risks if governments have financial obligations within the programme structure).⁷ There is some evidence that these types of programmes have led to higher levels of insurance coverage for covered climate perils. In countries with catastrophe risk insurance programmes in place for flood losses, the share of economic losses insured is significantly higher than in countries without such programmes – and the same appears true in the case of storm losses.⁸

The design of catastrophe risk insurance programmes can have different implications in terms of the programme's ability to support broad availability and affordability of coverage, contribute to risk reduction and limit fiscal exposure. Careful consideration needs to be given to the potential trade-offs inherent in different approaches to programme design (OECD, 2021^[32]).

Catastrophe risk insurance programmes, particularly those that benefit from government co-insurance, reinsurance or a guarantee, should be regularly reviewed with the aim of ensuring that the programme is achieving its policy objectives and to take account of developments in private insurance and reinsurance markets. The reviews should consider whether broad levels of coverage have been achieved and financial vulnerabilities have been reduced as well as whether there is any need to revise the scope of programme coverage due to increases or reductions in private market capacity (e.g. in terms of types of policyholders and/or perils included). Such reviews should also aim to ensure that the fiscal risks resulting from government financial involvement in the programme are minimised, including by leveraging any additional opportunities to transfer programme exposure to private insurance, reinsurance or retrocession markets.⁹ It is also important that the design of these programmes encourages risk reduction and adaptation in order to avoid providing incentives for continued construction or increased exposure in high risk areas that are prone to floods or coastal devastation for example. Programmes that make insurance coverage broadly available without accounting for the level of risk could reduce incentives for private and public investments in risk reduction and adaptation as the costs of not reducing risk will ultimately be borne by the programmes through claims payments, and not by those in a position to reduce the risk (a form of moral hazard). Risk-based pricing or deductibles, risk management requirements or the promotion of targeted investments in risk reduction in high-risk locations can address this problem of alignment of incentives for risk management.

Box 5.7. Responding to needs of low-income countries and vulnerable groups

The policy and regulatory approaches described in this section can support the availability, affordability and take-up of insurance coverage for climate losses and damages although their effectiveness will be limited in countries where insurance penetration (or insurance culture) is very low. In those countries, enhancing the contribution of insurance to absorbing losses and damages will require initial investments in creating an enabling environment for insurance market development. There are a number of factors that have been empirically linked to insurance market development, including the strength of the legal framework, levels of financial development, private participation in the insurance market as well as cultural factors and broader economic criteria (such as income and inequality) (Feyen, Lester and Rocha, 2011^[37]). Financial (insurance) literacy and the strength of insurance regulatory and supervisory frameworks (licensing, solvency, etc.) are also important for the development of insurance markets.

Particular attention should be focussed on addressing the financial protection needs of vulnerable segments of society in developing countries, such as low-income households, small businesses and smallholders in the agricultural sector. Inclusive insurance instruments, such as micro-insurance for households and businesses and weather index insurance for the agricultural sector, can play an important role in helping to meet the most urgent needs of vulnerable groups. Microinsurance premiums have reached over USD 1 billion, providing coverage for an estimated 372 million people (Murray, 2022^[38]), although coverage for losses and damages related to climate-related extreme events remains a small portion of the overall microinsurance market.

Governments should assess the potential impact of climate change on the future availability of affordable insurance coverage. An increase in losses and damages due to climate perils will necessitate an upward adjustment of the premiums that insurers (and reinsurers) collect for the coverage that they provide – exacerbating existing challenges in providing coverage at a cost that households and businesses are willing (or able) to pay.¹⁰ This assessment should include an evaluation of potential future losses and damages relative to estimates of future financial capacity (such as income) in order to determine whether increased insurance costs could lead to affordability challenges. This would allow an evaluation of potential policy or regulatory interventions that may be required to address these challenges¹¹ and should also be used as an important criteria for identifying priority risk reduction and adaptation measures.

Access to credit can also play an important role in ensuring that households and businesses have access to the funding necessary to manage disruption to livelihoods or business operations and to support reconstruction of damaged assets. A financial sector regulatory framework that supports the availability of credit for households and SMEs is therefore also critical, particularly where insurance coverage is limited or unaffordable. Governments can support credit availability by providing guarantees for loans extended to impacted households or businesses which can increase access to loans and reduce the cost of financing. However, unlike insurance coverage, loans must be repaid and could therefore increase leverage and potentially lead to future financial difficulties for households and businesses if repayments account for an unsustainable share of income or revenue. Significant credit defaults could also have implications for financial stability and for governments if loans were backed by a government guarantee.

Aligning incentives across levels of government

An important share of contingent liabilities for central governments is the financing of the costs for reconstructing and rehabilitating public assets owned or operated by subnational governments. Countries should have clear and explicit cost-sharing mechanisms regarding post-disaster assistance.

In countries where post-disaster assistance by central governments is important, it may create the expectation from subnational levels that they can avoid repaying the costs of disasters and thus invest little

in risk prevention efforts. A well-designed financial assistance framework can help mitigate this moral hazard. By defining the reimbursement conditions of reconstruction and relief efforts (e.g. eligibility criteria, commitment ceilings, etc.), central governments can ensure that subnational governments consider how the residual costs can be addressed. In this context, central governments also have a role to play in supporting subnational ones in identifying the measures that can be taken to reduce the costs for reconstruction they will have to bear. This can include cost-sharing of structural preventive investments and guidance on the use of non-structural measures. Central governments can also require or encourage the use of cost-benefit analyses (see above). In other words, a strong and clear financial assistance framework, complemented by active government support, should encourage subnational levels to invest in structural and non-structural risk reduction measures.

Financial assistance frameworks governing post-disaster payments made to subnational government should also consider the use of insurance by subnational governments. The clarity of financial assistance rules to subnational governments is essential for ensuring proper fiscal risk assessment by central governments and can reduce fiscal risks related to implicit liabilities by encouraging subnational governments to manage the climate-related risk that they assume.

These incentives should extend to property owners and infrastructure providers at the community level who stand to directly benefit from a country's financial investment in reducing climate risk. By placing some of the cost on property owners and infrastructure providers, in terms of subnational and local government authorities, it also incentivises them to build new assets in low-risk places. This could take the form of targeted levies placed upon property owners or asset owners, which are gathered then reinvested into resilience activities in the future.

Ensuring clarity in public financial assistance arrangements for households and businesses to mitigate future financial losses

A significant share of losses and damages from climate-related catastrophes are uninsured in developing countries as well as in many high-income countries. Efforts to support the availability of affordable insurance coverage may not achieve full coverage of climate-related losses and damages to households and businesses and there may still be segments of the population and economy that may remain uninsured.

Governments should ensure that basic compensation and post-disaster financial support is made available to reduce economic and social hardship, for instance through the development of government financial assistance arrangements. For households, financial arrangements for disasters could involve the provision of compensation payments to cover certain types of losses such as property damage and basic living expenses; for businesses, they could provide for compensation and/or special lending.

These arrangements, established in advance of any disaster, should have clear provisions on the nature, scope, and level of financial assistance, for instance with well-defined eligibility criteria and caps on the level of assistance, with payments covering only essential or reasonable needs. Such arrangements will typically exclude compensation of already insured property, in order to avoid double payments. Furthermore, to prevent moral hazard, no compensation should be provided if insurance could ordinarily have been purchased to provide coverage (if insurance markets are present and coverage is affordable). By providing clarity on the scope and extent of government financial assistance, these arrangements can serve to reduce expectations of full compensation for losses, while strengthening incentives for financial self-protection and risk reduction, and help to clarify and limit the government's contingent liabilities (OECD, 2012^[36]). Financial support that is provided by governments to households and businesses in the aftermath of climate events can create expectations of future support and discourage individual responsibility for reducing risk or seeking financial protection. The establishment of clear eligibility criteria and distribution procedures is critical for ensuring that funds are provided to those in need in a timely fashion – which should support quicker recovery and reduce hardship.

5.1.3. Prepare integrated multipronged government financial strategies

The different budgetary, risk financing and risk transfer tools for funding climate-related fiscal risks have different advantages and limitations – as well as different costs that will vary across countries depending on factors such as fiscal position, revenue-generating capacity, access to capital markets and official financing and quality of risk data. The trade-offs between these various approaches might also evolve in the context of climate change. The framework for action that follows recommends that governments aim to maximise the use of funding capacities available through fiscal frameworks and access to debt markets, which will usually provide the most cost-effective approach to funding climate losses and damages for governments while recognising that developed and developing countries face different levels of fiscal capacity and access to (low-cost) debt financing (see Box 5.8), which may call for different approaches.

Box 5.8. Developing government financial strategies to strengthen resilience to climate-related events

A government financial strategy is there to ensure sufficient access to funding to meet the spending needs that will materialise in the future. The goal is to address the fiscal risks that may arise as a result of climate-related losses and damages. This framework for government action recommends that governments maximise the use of the funding capacity available through existing fiscal resources and access to public debt financing, to the extent possible, while recognising the existence of budgetary and financing constraints and possible access to (lower cost) official financing, particularly for developing countries, which may require different financial approaches:

- Using funds available through fiscal frameworks and public debt financing is generally the lowest-cost approach for responding to climate-related losses and damages to governments. For instance, general contingency reserves that can be accessed in the event of a disaster can provide an efficient first line of defence. Countries may, in some circumstances, need to rely on budgetary reallocations to secure funding; however, such an approach, arranged in an *ex post* manner, may create risks. Budget reallocations may not provide sufficient funding in the case of extreme events, could require additional legislative approvals (affecting their timeliness) and can undermine other spending priorities. In developing countries, the reallocation of budgeted funds might be impossible given tight government financial constraints and can derail long-term economic and social investments and threaten development strategies. While public debt financing can provide an efficient source of financing, its arrangement *ex post* can also involve challenges. For instance, issuing new debt can be costly in countries facing high borrowing costs (especially where the event itself results in the deterioration of credit ratings (IMF, 2019_[39])) or may be limited by debt sustainability or market access constraints; furthermore, it may take time, suggesting that this financing tool may be more suited to funding recovery and reconstruction, not relief. For countries facing fiscal or debt financing constraints, and/or with access to sources of (lower cost) official finance (e.g. concessional loans, premium subsidies), *ex ante* financial tools may be more cost-effective for ensuring funding adequacy to meet climate-related losses and damages.
- *Ex ante* financial tools include allocating funds in advance for an uncertain future need, for example by establishing a disaster reserve fund or acquiring insurance. However, such tools have an opportunity cost in terms of the efficiency of capital, as the funds could otherwise be allocated to other spending needs, including investments in risk prevention and medium- to long-term growth and development. When other spending priorities are not met, such pre-funding can also become politically costly. For countries where establishing sufficient *ex ante*

reserve funds is limited by fiscal capacity or high political costs, a contingent credit arrangement could provide a cost-effective alternative, particularly the lower-cost contingent credit provided by official lenders..

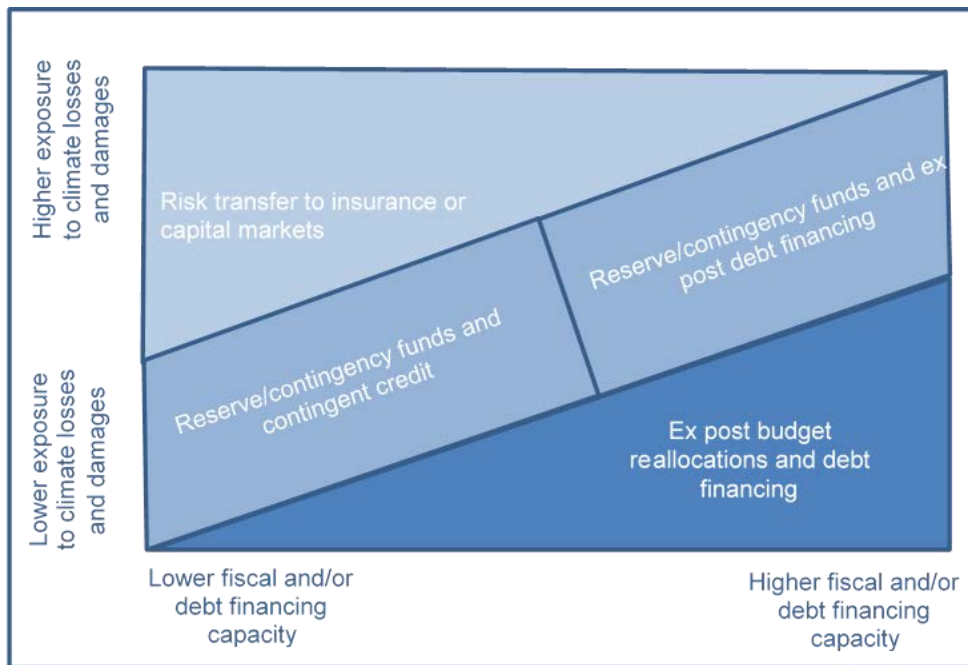
As a result of these considerations, different countries will choose different budgetary and financing solutions based on their fiscal and debt financing capacity and constraints that they face and the opportunity costs in terms of alternative spending demands, which could involve a mix of *ex ante* and *ex post* tools.¹ What is critical is that governments explicitly assess their potential funding needs, given fiscal risks and overall risk assessment, and develop a financial strategy that can feasibly provide the funds required to meet those needs – at lowest possible cost while ensuring that the funds will be available when needed, across relief, recovery and reconstruction.

Note: ¹ Budgetary, risk financing and risk transfer tools can be classified as *ex ante* or *ex post* based on: (i) whether the financial tool or financing is arranged or established before or after the event; or (ii) whether the financing provided through the financial tool is paid for before or after an event. For example, a contingent credit may be established before an event (and would therefore be considered an *ex ante* tool) although the financing provided would be repaid after the event (and therefore could be considered *ex post*). A risk transfer arrangement is always established before the event (*ex ante*) and paid for before the event through premium payments (*ex ante*).

In the past, countries have generally not explicitly planned for climate-related contingent liabilities, relying instead on ad hoc, *ex post* funding strategies (Bevan and Cook, 2015^[40]). In countries where the scale of potential climate-related losses and damages is low relative to debt financing capacity, there may be little need to create dedicated reserve/contingency funds, pre-arrange access to contingent credit or transfer risk to insurance or capital markets, as public debt financing may be efficient and the most cost-effective, thus fully adequate as a financing tool – allowing funds to be allocated to other productive uses (OECD, 2012^[36]).

In countries with more significant potential for climate-related losses relative to debt financing capacity, the use of financial tools arranged *ex ante* such as disaster reserve funds, pre-arranged contingent credit and risk transfer help ensure that sufficient funding will be available to respond effectively to climate catastrophes when they occur (see Figure 5.1), as public debt financing may be costly or unavailable, particularly following a major disaster event.

Figure 5.1. The impact of exposure and capacity on fund strategies



Source: OECD

Investments in risk reduction and climate adaptation or measures to reduce the financial vulnerabilities of households, businesses and subnational governments (such as broader insurance coverage) can reduce national government exposure and the need for reserve funds, pre-arranged contingent credit or risk transfer instruments. However, while risk reduction and adaptation actions can help mitigate climate-related liabilities, residual fiscal risks will always remain. Financial strategies should be developed to ensure adequate funding to help governments manage these remaining residual fiscal risks and the related contingent liabilities in a way that meets cost and liquidity objectives and supports economic recovery, as will be discussed below.

Assessing budgetary capacities to fund relief, recovery, and reconstruction, including through budget reallocation

Once fiscal risks are assessed, a strategy for ensuring adequate funding for the expenditures required for responding to climate-related catastrophes needs to be developed. The strategy should consider the amount of funding needed and when and should weight the costs and benefits of different approaches (including opportunity costs of alternative uses of the funds as well as the potential benefits of investing further in risk reduction and adaptation).

As a starting point, governments should consider their own financial capacity for managing climate-related risks through their budgetary and fiscal framework, as borrowing from financial markets or transferring risks to (re)insurance will introduce costs (interest expense, premium payments, respectively). Since public budgets are approved in advance, the scope for securing funding for a climate-related event within the fiscal framework can be limited in the short term. Immediate funding can be secured through budgetary reallocations, although there may be rules on the use (or not) of reallocations and their extent and, as discussed below, reallocations have opportunity and political costs. In many countries, general contingency reserves for meeting unanticipated and non-recurring expenditures may exist and may be used to fund climate-related event costs, providing a first potential source of funding and reducing the need for budgetary reallocations or minimising their extent. In the medium term, governments may have the

capacity to generate revenue-enhancing measures, such as taxes, to strengthen their fiscal position and ensure funding capacity to compensate losses and fund recovery and reconstruction. Low- and lower middle-income countries are likely to face greater fiscal constraints and higher opportunity costs given more limited revenue-generating capacity, greater challenges in ensuring domestic resource mobilisation, and more substantial demands on limited fiscal resources.

In the eventuality of more frequent and/or larger climate-related risks, *ex ante* financial tools may be needed. For instance, extra-budgetary reserve accounts or funds, possibly built up over time (or as needed restored) through budgetary allocations and accessible in the event of a climate disaster, may be established. There will also likely be a need to have a recourse to external financing, most notably through public debt markets (and official financing, where available), but also possibly through borrowing from commercial banks or transferring risk *ex ante* through insurance (see subsection “Optimising financial under budgetary and financing constraints, within an overall framework of disaster risk management and risk reduction” below).

Contingency and reserve funds

Climate risks should be integrated into the budget and public financial management framework to the extent possible, from fiscal risk assessment to the potential creation of fiscal buffers to absorb the costs of climate-related catastrophes (Cebotari et al., 2009^[41]). Governments commonly use two budgetary instruments to build these fiscal buffers: contingency reserves and dedicated reserve funds (Cevik and Huang, 2018^[42]). Both contingency reserves and reserve funds allow central and subnational governments to retain a certain amount of risk *ex ante* (effectively, to self-insure that risk). The main difference between the two instruments is whether the unspent funds are returned at the end of every fiscal year (contingency reserves) or if they accumulate over time (reserve funds). The amount of risk that can be retained depends on the amount of the funds set aside. Because they are larger, reserve funds should be used to cover the costs of lower-frequency but higher-severity climate disasters. Conversely, contingency reserves should be mobilised for higher-frequency but lower-severity events such as localised climatic events. After a disaster, contingency reserves should be disbursed first to cover the immediate cost of aid and relief to affected populations. Reserve funds should supplement contingency funds once they are depleted or to fund longer-term costs related to recovery, rehabilitation and reconstruction.

When a disaster strikes, *ex ante* budgetary tools (contingency reserves and reserve funds) act as fiscal buffers that provide quick liquidity to cover immediate post-disaster financing needs without compromising other spending priorities or long-term fiscal sustainability. These buffers can also help avoid expensive debt financing for countries with lower credit ratings. Most countries have annual contingency reserves in place to quickly address disaster-related costs. However, specificities regarding when and how these provisions can be used vary across countries.

To minimise opportunity costs, the amount of resources set aside for climate-related contingent liabilities should be determined based on risk assessments (including climate risk assessments). Contingency reserves should be large enough to provide immediate liquidity in case of disaster but not so large that line ministries try to capture the funds. Reserve funds, on the other hand, are most appropriate for more rare but costly contingent liabilities. As a result, drawdowns from these reserves should only be possible when fiscal costs exceed a certain threshold. Contingency reserves should be used to finance fiscal costs below that threshold (i.e., costs from lower-severity disasters).

Accumulating enough reserves to absorb a large catastrophe requires an extended period free of disasters. Allocations to a reserve fund are made on an annual basis so that capital can accumulate over time (i.e., the reserve grows with each year without a disaster). In countries exposed to high-frequency disasters (of medium or high-severity), reserve funds are not appropriate solutions. For example, in small-island developing states that are particularly exposed to climate hazards, total disaster-related costs might exceed annual GDP. Even in larger economies, reserve funds will not be replenished in time if two

disasters occur within a relatively short interval. However, countries less exposed to frequent climate hazards enjoy more flexibility in financing contingent liabilities over time. Allocations made each year can be smaller because they are spread out over longer periods. At the same time, a prolonged period without a disaster creates a false sense of security, which, in turn, can create political pressures to repurpose the reserve funds for other needs. This pressure could be mitigated, to some extent, by allowing part of the reserve funds to be used to provide greater incentives for investments in risk reduction – while ensuring that reserve funds remain at adequate levels to meet post-disaster needs.

Though time is of the essence in a post-disaster context, the swift disbursement of funds should not come at the expense of oversight and transparency. Contingency and reserve funds should be carefully designed to avoid creating opportunities for the mismanagement of public funds. Governments should therefore stipulate clear and stringent conditions for the use of contingency and reserve funds (Tommasi, 2016^[43]). For instance, various modalities can be set to authorise the disbursement of funds. In some countries, standing authorisations allow for the disbursement of funds at the discretion of the executive branch following a trigger (e.g., an official declaration of disaster). Standing authorisations with automatic triggers are best suited to the immediate needs of climate disasters. However, they should be designed carefully to reduce conflicts of interest. For example, if independent agencies are in charge of making the official declaration of disaster, they can act as a check on the executive branch.

In terms of transparency, requiring an official declaration of disaster (or at least a public announcement) ensures that drawdowns cannot be made without the public's knowledge. After triggering reserve funds, financial management authorities should disclose any disbursements and classify them according to their purpose and economic nature (Cevik and Huang, 2018^[42]). To promote fiscal discipline and increase transparency, reserve funds should be kept within the usual budget process and follow best public financial management (PFM) practices (Allen and Radev, 2010^[44]). The fund balance should appear in financial statements, while any disbursement should be disclosed promptly through budget execution reports (IMF, 2016^[45]). Best practices also include conducting public audits into the use of contingency and reserve funds.

Governments generally invest the funds set aside in a reserve until they are needed. However, doing so should not come at the expense of liquidity. Given the urgent nature of disaster relief, investment strategies should aim to maintain a high degree of asset liquidity (Cevik and Huang, 2018^[42]). Investing in domestic markets can be costly if a large climate hazard causes a significant disruption to the economy and domestic financial markets. To mitigate this risk, funds can be invested in liquid foreign assets. In addition, the repatriation of these assets following a disaster would also improve the balance of payments at a time of economic distress while holding reserves in domestic banks would also cause dangerously large withdrawals precisely when the banking system is vulnerable (Ibid.). However, ensuring the liquidity of funds does not guarantee they can be used quickly to cover financing needs. The establishment of operational procedures for the disbursement of funds from contingency reserves and reserve funds is critical for ensuring timely disbursement while maintaining proper oversight. Governments should also ensure that public procurement rules allow for the immediate provision of aid and relief to affected populations (Ibid.).

As outlined below, contingent credit arrangements from official lenders can provide an alternative to contingency and reserves funds in countries with more limited fiscal capacity and significant demands for fiscal resources to support economic and social development. Such arrangements should be designed to provide similar levels of speed of access in order to ensure the availability of funding for immediate needs and be complemented by established procedures for disbursement of funds.

Budget reallocations

Governments commonly use flexibilities embedded in the budget, including emergency reallocations, to finance relief and recovery efforts. Emergency budget reallocations redirect budgeted resources from lower

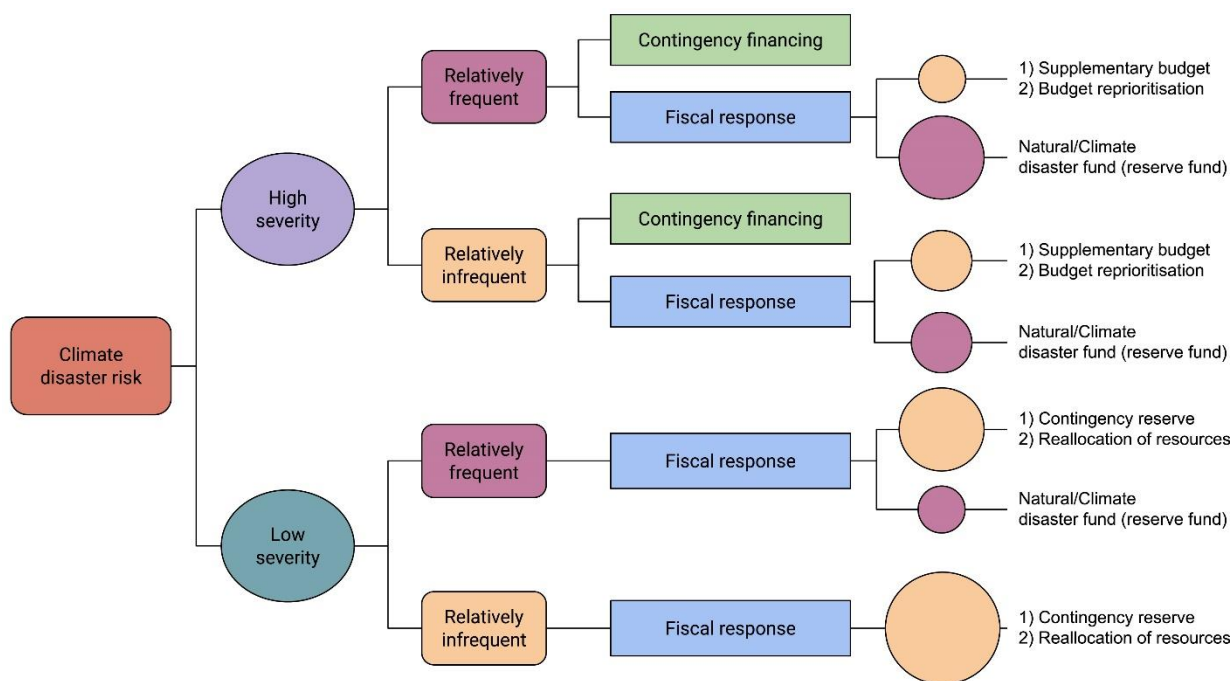
priorities to finance more urgent needs. The most critical features of budget reallocations are speed and flexibility (Cevik and Huang, 2018^[42]). Financing the immediate costs of climate disasters requires fast mobilisation of resources to provide the affected population with emergency aid and relief (World Bank, 2019^[46]). However, as with other budgetary mechanisms to secure funding, speed should not compromise fiscal governance and transparency. Legislative authorities should therefore be informed of reallocations between budget items even if their approval is not required to operate them. In addition, the executive branch should regularly report the overall impact of reallocations to the legislature. If a supplementary budget is put forward, it should be subject to the same scrutiny that characterises the regular budget process. Once approved, supplementary budgets should be published in the same way as annual budgets.

When disaster costs exceed available contingency reserves, budget reallocations can help meet new expenditure priorities, including post-disaster relief and recovery efforts. Budget reallocations may be directed at the contingency fund or directly to line ministries in need of additional funding. However, as discussed in chapter 3, such realignments to the budget can have high opportunity costs – particularly in low- and lower middle-income countries facing tighter fiscal constraints. At the same time, some budgeted investments may have been derailed by the disaster. Through budget reallocations, governments can shift budgeted resources away from existing investment projects and recurring expenditures to meet more urgent requirements (Bevan and Cook, 2015^[40]; Laframboise and Loko, n.d.^[47]). After a disaster, governments can realign resources in the next budget to prioritise rehabilitation and reconstruction efforts. Budgets may also be cut in the years following a disaster, especially when government revenues are expected to fall due to economic disruptions (OECD, 2015^[48]).

In practice, budget reallocations can take the shape of a virement, a supplementary budget, or a reprioritisation of budgets in the years following a disaster (see Figure 5.2).

- A **reallocation of resources**, which may or may not require legislative approval, as it does not impact the fundamental composition of expenditures, nor does it change the total budgeted level of such expenditures expenditure (Saxena and Yläoutinen, n.d.^[49]) Reallocations can be used to supplement contingency reserves in funding post-disaster relief.
- A **supplementary budget** changes the annual level of total budgeted expenditure or restructures the distribution of appropriated allocations. As such, it requires legislative authority. Supplementary budgets should be used for high-severity climate disasters when virements and contingency reserves alone cannot meet recovery and reconstruction needs (Cevik and Huang, 2018^[42]).
- The **reprioritisation of budgets** is part of the next regular budget process (y+1). Following a major climate disaster, expenditure priorities may change significantly. Governments can realign the next budget according to their revised long-term investment plans. These revisions should be based on a detailed post-disaster needs assessment. The need for budget reprioritisation may be particularly substantial in developing countries that receive additional financing from bilateral and multilateral donors to cover disaster-related costs (Cevik and Huang, 2018^[42]).

Figure 5.2. Financing the fiscal cost of climate disasters through budgetary instruments



Note: The size of the bubble in the rightmost column represents the relative importance of the instruments listed.

Source: Adapted from (Cevik and Huang, 2018^[42])

Assessing debt market borrowing capacities, including cost and speed of access

Gross debt financing requirements for governments reflect the need both to refinance outstanding debt due in the year and to fund new spending requirements included in the government's budget (i.e. net borrowing). Public debt market financing, the payments for which are backed by the government's balance sheet and capacity to raise new fiscal resources (e.g. through taxes), is often the cheapest source of external financing (with the exception of official financing, as discussed below), and provides the necessary funds for the current year's public budget, beyond that provided by government revenues, and for any new and unexpected expenditures needs during the course of the year, authorised through supplementary budget appropriations. Accordingly, debt market financing provides an efficient source of funding to manage climate-related disaster costs for most countries, should the current year's budget allocation prove to be inadequate to fund climate-related disaster expenditures. Furthermore, and particularly for governments with a strong credit standing and that regularly access public debt markets, access to public debt finance can be fast, enabling governments to secure funds rapidly to meet some of the costs of a large event, although not necessarily for immediate disaster relief.

However, governments lacking a strong credit standing, which is the case in many developing countries, can be expected to face higher costs of debt financing, which may be aggravated by bouts of global financial and macroeconomic instability. These factors may reduce the capacity of such governments to borrow from financial markets, and may also affect the speed at which they can borrow, should a large climate event occur, with costs exceeding budgetary capacities, as a deteriorated fiscal position may increase financing costs further. As discussed earlier, the increasing frequency and/or scale of climate-related events and the broader integration of these risks into credit ratings and credit models may adversely affect the cost of accessing public debt finance for countries facing significant climate vulnerability. Governments that face constraints in accessing low-cost financing from public debt markets may need to

consider – or could benefit from considering – alternative sources of funding for meeting climate-related expenditure needs, as discussed in the next section.

Optimising financial tools under budgetary and financing constraints, within an overall framework of disaster risk management and risk reduction

Governments with reduced budgetary capacities to manage large-scale climate hazards, for instance owing to limited budgetary flexibility within an overall constrained fiscal framework, or facing external financing constraints due to their credit standing, may experience difficulties in securing funds efficiently and cheaply to meet disaster-related expenditures. For many governments, particularly in lower-income countries and small island developing states, the potential public sector share of losses from extreme climate-related catastrophes is equivalent to a significant share of general government revenues, which would make it extremely challenging to fund recovery and reconstruction spending needs through current revenues (particularly if these events occur with increasing frequency). These same countries are also likely to face external debt financing constraints or higher public debt financing costs.

While public debt financing may remain an option for such governments to access funds, although at possibly higher costs in comparison with countries with a higher credit standing, governments facing a more constrained budgetary and financing environment may also consider a number of other financial tools to access funds to meet disaster needs. Options may include:

- *Official development financing (if available)*: Low- and middle-income countries may have access to official development financing, with access to grants and pre-arranged finance at concessional (or below-market) rates. Official financing may be provided as humanitarian assistance to support relief and recovery efforts (usually as grants) or as grants or (concessional) loans to finance reconstruction. As noted in Chapter 3, a number of countries have arranged access to contingent credit through multilateral development banks and other donors that is triggered based on the occurrence of an eligible event. Pre-arranged access to official financing can mitigate some of the risk that official financing may not be available in time for response to some events.
- *Extra-budgetary disaster reserve funds*: Countries may establish extra-budgetary reserves, enabling them to build up funds for expected future disasters. These funds are built up through yearly budgetary allocations.
- *Commercial bank credit arrangements*: Governments can access credit arrangements provided by commercial banks, provided at market interest rates. The credit status of the government can, as with public debt markets, be expected to affect the cost of financing. Commercial bank financing is more significant for countries that do not have the capacity to access international bond markets.
- *Risk transfer*: Governments may have the option of transferring risks to insurance markets or to capital markets via insurance-linked securities, such as catastrophe bonds. As discussed below, the credit status of the government is not relevant for pricing; by contrast, the credit standing of the insurer, or the structuring of the funds backing the issued securities, is relevant. As noted above, the use of risk transfer arrangements by developing countries (particularly regional risk pooling arrangements) may be supported by donor-provided premium subsidies that would reduce the cost of this form of funding.

The different financial tools – budgetary, risk financing, and risk transfer – that may be employed to secure funding for climate-related losses and damages involve different advantages and limitations, particularly in terms of speed of access and cost (including opportunity costs as well as “political” costs):

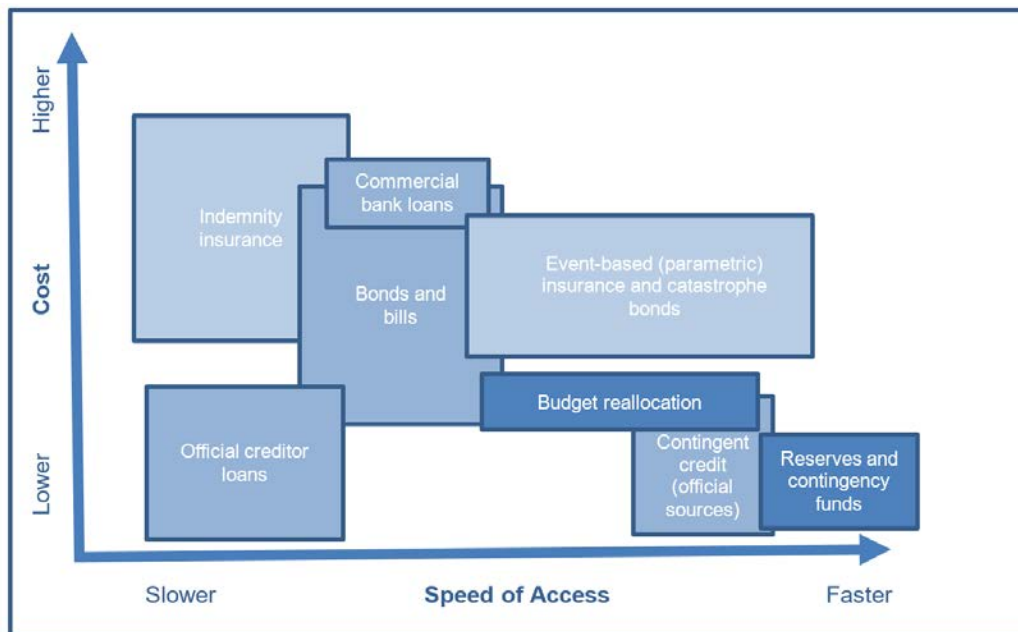
- *Ex ante* budgetary tools, which have been discussed above, such as dedicated reserve funds, generally involve low transactional costs relative to market-based instruments but potentially high opportunity costs, depending on potential alternative use of the funds as well as on the ability of governments to earn a return on any invested funds. Funding through reserve funds can generally

be accessed quickly, depending on legislative requirements related to their use, although there may be political risks (such as appropriation) if funds are not accessed.

- Credit-based financing, including public debt finance described earlier, involves transaction costs, including: issuance, underwriting and interest costs for debt securities; and interest costs for commercial bank loans. Such risk financing also involves opportunity costs in terms of the potential future alternative use of funds for interest payments – although for public debt finance, such costs may not be large, particularly for countries with a high credit standing. Bond issuance and commercial bank loans may take longer to access, depending on a country's existing relationships with investors and lenders. Access to financing through commercial lending and debt markets may also involve some risks related to market conditions when the funding is needed (which may increase cost or reduce availability).
- Official financing, while (usually) accessible only to developing countries, is generally provided at low or no-cost. Humanitarian assistance and concessional loans (arranged *ex post*) can be volatile and uncertain and subject to political considerations in the donor country. Contingent credit arrangements provided by official lenders will provide the quickest and most secure access to funding and can mitigate some of the risks related to the volatility of official financing.
- Risk transfer tools, including insurance and insurance-linked securities such as catastrophe bonds, involve transaction costs in the form of premium payments in the case of insurance and reinsurance (which incorporate commissions, insurer operating expenses and profits) and issuance, underwriting and interest costs in the case of catastrophe bonds. As noted above, these costs can be significant depending on the level of diversification in the risks transferred, the expected frequency of payouts and the quality of risk information – and will ultimately depend on loss experience. Indemnity-based insurance would likely be more costly than event-based (parametric) coverage given higher underwriting and claims adjustments costs but would also provide coverage consistent with losses and damages incurred (event-based coverage can involve basis risk which could lead to uncovered losses or damages). Event-based coverage will payout much more quickly than indemnity insurance, including in the case of catastrophe bonds that apply event-based triggers (including modelled loss triggers). Similar to disaster reserve funds, risk transfer tools involve opportunity costs relative to alternative uses of the funds used to pay premiums or interest on catastrophe bonds and political risks if premiums are paid over many years without the occurrence of a covered event. Official financing can (and has) supported the affordability of premiums for vulnerable countries through premium subsidies. Unlike credit-based financing and official loans, insurance and catastrophe bond payments do not need to be repaid after the event which may provide benefits, particularly for countries with limited fiscal space or facing debt sustainability challenges or for whom additional borrowing could lead to a lower credit rating or increasing borrowing costs. The process of transferring risk to (re)insurance or capital markets can also create other risk management benefits.¹²

Figure 5.3 provides a simplified illustration of the relative speed of access, amounts available and (approximate) cost of different types of *ex ante* budgetary, risk financing and risk transfer instruments, although factors including expected loss, fiscal rules, sovereign credit risk, market conditions and opportunity costs for alternative use of funds have an impact on the trade-offs between different instruments. As a result, the relative cost, speed of access and available amounts could vary significantly for different countries.

Figure 5.3. Speed and cost of budgetary, risk financing and risk transfer tools (simplified illustration)



Note: This chart provides an illustration of relative (approximate) cost, amounts available (relative size of shape) and speed of access for different types of budgetary, risk financing and risk transfer tools (the different categories are linked by lines in the graph and shaded in different colours). The actual cost and speed will depend on specific country circumstances.

Source: OECD. Relative cost estimates are consistent with World Bank estimates in (World Bank, 2017^[50])

Accessing risk financing and risk transfer to respond to public spending needs can involve significant costs, particularly if accessed through commercial credit and insurance markets. In the case of risk (debt) financing, costs are driven by assessments of the repayment capacity of the borrower and could increase as a result of the event directly or due to concerns about the capacity of the borrower to manage the risks that could materialise in the context of a changing climate. In the case of risk transfer, costs are driven by the quality and availability of data for risk assessment (more limited or lower quality data can lead to a surcharge to account for uncertainty), the level of diversification within the portfolio of risks transferred and the pure risk cost of the ceded risk (i.e. expected loss). Increasing frequency and/or severity of climate losses and damages in the future and uncertainty about future climate impacts would likely lead to higher costs in terms of premium requirements (for insurance) or higher interest costs (for catastrophe bonds).

There are a number of approaches to reducing the cost or increasing the value of risk financing and risk transfer tools that governments should consider when establishing financial strategies:

- Governments with access to credit financing through official creditors should aim to maximise the use of these sources of financing to meet funding needs that cannot be efficiently met through reserves and contingency funds. Contingent credit offers both speed of access and cost efficiency.
- Governments that are highly-exposed to climate risks should aim to integrate natural disaster clauses or insurance-based funding relief into debt financing arrangements in order to provide a source of funding for public sector costs while limiting the need for additional borrowing in the aftermath of climate event, which might only be available at a higher cost given the implications of the event on repayment risk.
- Risk transfer instruments to fund relief and recovery needs can offer an alternative to risk financing for those facing debt financing constraints (limited access or existing high debt levels) . This form

of funding will be more cost-efficient for diversified risk portfolios and if calibrated to less frequent payouts (i.e. more severe events).

- Risk transfer instruments to fund reconstruction can similarly offer an alternative to risk financing for countries with debt financing constraints. Significant efforts should be made to access insurance or capital markets with a diversified pool of risks in order to benefit from lower premium costs. This is particularly important in the case of indemnity insurance for public assets.
- Finally, some of the most climate vulnerable countries, including SIDS, may only be able to access commercial debt at a high cost, which may impact debt sustainability. Risk transfer instruments may be available only at unaffordable premium rates. Therefore, for such countries, the seeking of international grants and other forms of assistance should be integrated into the financial strategy. This could include premium subsidies financed by providers of development assistance, which would enable risk transfer, although it is worth noting that such subsidies have generally been made in support of the establishment of regional risk pools, suggesting the desirability of pooling (where and if relevant) to ensure efficiencies in small country access to global insurance markets.

5.2. Promoting global climate financial resilience

Climate change is a global phenomenon, and as such requires collective global action, especially because some countries will not be able to cope with its consequences based on only their own resources. As described in Chapter 1, developing countries, especially LICs, LDCs and SIDS, are likely to experience the most severe impacts, not only due to their higher vulnerability levels but also due of their exposure to the often more frequent and severe hazards. These countries do not have the capacity to cope with the hazards they face and will likely need the direct support from the international community.

In 2021, the OECD Development Assistance Committee issued the OECD DAC Declaration on a new approach to align development co-operation with the goals of the Paris Agreement on Climate Change, which includes a recognition of the “urgent need to support investments in adaptation and resilience” and the “importance of averting, minimising, and addressing loss and damage associated with the adverse effects of climate change” (OECD, 2021^[51]). Recent work by the OECD shows that donors invest large shares of their Official Development Assistance (ODA) to capacity development activities, such as technical co-operation, study exchanges, visits, policy support and training (Casado-Asensio, Blaquier and Sedemund, 2022^[52]). While this matches well partner countries’ priorities, the effectiveness, impact and sustainability of these investments are questioned. To ensure results from these investments, donors ought to take a more integrated view and focus on a range of issues, including on supporting partner country access to finance, improving the access and availability of climate services and data, and fostering partnerships with academia or the private sector. While capacity development matters more for climate change adaptation than for mitigation, information is lacking on how donors are supporting partner countries on climate-related losses and damages (Casado-Asensio, Blaquier and Sedemund, 2022^[52]). As this area of work develops in the future, donors could draw the lessons to ensure capacity is developed sustainably to heighten action and ambition (OECD, 2021^[25]).

5.2.1. Promote integrated strategies to strengthen financial resilience at the country or regional level

Supporting the integration of climate related risks in fiscal risk assessments

Capacity to develop fiscal risk assessments that integrate the potential impacts of climate change and assess potential financial vulnerabilities across society is critical and should be the basis for coordinated interventions by development partners. Fiscal risk assessments that are forward looking, account for the implications of a changing climate and integrate all potential sources of fiscal risk (i.e. including the implicit

liabilities that might arise due to financial vulnerabilities) provide a sound basis for targeting investments in risk reduction and adaptation and developing a strategy to ensure adequate funding for recovering and rebuilding in the aftermath of climate-related catastrophes. These assessments should be country-owned and act as a shared basis for supporting country efforts to protect public finances against climate losses and damages. Among the 324 projects in 108 countries reported under the InsuResilience data collection for the year 2021, less than 1% were focused on the development of a risk financing strategy (or elements of such a strategy) (although the number of disaster risk financing strategies under development increased to 47 in 2021, relative to 33 in 2020) (InsuResilience, 2022^[53]), (InsuResilience, 2022^[54]). This suggests that there may be opportunities to increase support for the development of risk financing strategies as a basis for identifying appropriate and donor-supported financial tools.

Efforts by the International Monetary Fund to better integrate the potential risks of climate change catastrophes for public finances in surveillance and Article IV consultations with its member countries (IMF, 2021^[55]) can provide a basis for encouraging countries to develop fiscal risk assessments and to integrate a climate change and climate resilience perspective into public financial management (as well as plans for ensuring adequate funding for response to these events). The proposed establishment of an IMF Resilience and Sustainability Trust to provide long-term concessional financing in support of policy measures that build long-term economic resilience to climate change (and other risks) can encourage country implementation of fiscal risk assessments and disaster risk financing strategies that incorporate climate risks (IMF, 2022^[56]).

Supporting fiscal risk reduction through funding risk reduction and adaptation and supporting insurance market development

Addressing the risks of climate losses and damages to public finances at the national level should be based on an integrated approach that includes the potential contributions of risk reduction (mitigation and adaptation) investments and the role of insurance markets in protecting households, businesses and subnational governments. There may be opportunities for international development partners to enhance the support that they provide to these other critical elements of fiscal risk management, including:

- Investment in risk analytical tools to support the development fiscal risk assessments and insurance underwriting;
- Investment in risk reduction and adaptation, including technical assistance for identifying risk reduction and adaptation options, grant funds and loans for investing in risk reduction and adaptation measures and efforts to leverage private sector financing for risk reduction and adaptation by facilitating the issuance of thematic bonds (including by supporting greater consistency and standardisation in ESG-asset reporting, definitions and recourse mechanisms);
- Investing in insurance market development and the availability and affordability of insurance coverage for climate loss and damage faced by households and businesses, including technical assistance related to insurance market development, insurance regulation and supervision and considering the need for the establishment of catastrophe risk insurance programmes for climate risks, as a way to promote insurance penetration and address potential insurability gaps;
- Supporting the effective management of public asset risks, including through the development of asset inventories, public asset insurance needs assessments and the establishment of public asset insurance pools; and,
- Ensuring the efficient use of funds in the aftermath of climate-related extreme events, including through the development of operational procedures that ensure the responsiveness and inclusiveness of social protection programmes.

Development partners are clearly supporting the elements above, although not always as part of an integrated approach for managing the climate risks. Approaching these elements in an integrated way has the potential to enhance their effectiveness and improve their scale.

Facilitating public financial management strategies at the country or regional level to strengthen financial resilience, including through innovative approaches

Once fiscal risks are properly assessed, technical assistance should be focused on developing adequate funding strategies for identified climate-related risks. This could include the establishment of reserve and contingency funds, budget reallocation procedures, debt management strategies and risk transfer arrangements. However, the relevance and importance of these financial management strategies depend on the extent and nature of climate-related risks and their impact on public finances.

Financial management strategies should benefit from strong coordination across the different crisis financing facilities available from development banks and other official donors and creditors to respond to identified funding needs. Support from international organisations and other official creditors for risk financing and risk transfer facilities should be clearly linked to the beneficiary country's fiscal risk assessment and identified funding needs. However, less than 40% of the initiatives included in the database developed under InsuResilience (2021 projects) were reported by implementing organisations as linked to the project country's disaster risk financing strategy (36% were reported as not linked) (InsuResilience, 2022^[53]). This suggests that there may be opportunities for increasing support for the development of disaster risk financing strategies and improving coordination across donor initiatives and linkages to country-owned risk financing strategies.

The G7 can show leadership in ensuring coordination. Recognising and acting on the challenges posed by the greater need for coordination has been a priority for both the previous and current G7 presidency (UK Government, 2021^[57]). Indeed, the current president, Germany, has made strengthening the climate and disaster risk finance and insurance architecture in a systematic, coherent and sustained way a priority in its presidency (MCII, 2022^[58]). Building on InsuResilience Global Partnership, their aim is to work towards a global shield against climate risks.

There may be opportunities for innovation in development partner contributions to climate-related financial instruments – some options for consideration include:

- Support for the inclusion of hurricane (or more general) catastrophe clauses in debt issuances (particularly clauses that involve a reduction in debt) by climate-exposed developing countries (e.g. through pension fund or sovereign wealth fund investment allocations) or financial sector capital requirements (assuming these clauses might reduce default risk);
- Support for developing other forms of catastrophe protection for borrowing by climate-exposed developing countries (e.g. catastrophe wrappers that provide debt relief upon occurrence of a climate event);
- Supporting further diversification of risk across regional risk pools and catastrophe risk insurance programmes (i.e. inter-regional transfers) in order to reduce reinsurance costs; and,
- Re-orienting *ex ante* premium subsidies for regional risk pool participation to *ex post* loss sharing, which could provide similar benefits in terms of reducing the cost of participation without subsidising the profits of (re)insurance companies. Development partners could potentially transfer some of their own exposure to loss sharing to reinsurance and retrocession markets (basically, providing a development partner backstop for regional risk pools and catastrophe risk insurance programmes).

5.2.2. Mobilise additional development finance to strengthen global financial resilience

While there has been an increasing amount of funds dedicated to addressing losses and damages, the availability of funds does not guarantee access to them (OECD, 2021^[24]). Several factors limit access. First, accreditation procedures are often complex and differ across funds. Second, application processes and fiduciary requirements often place a disproportionate burden on the limited administrative and technical capacities in developing countries. Climate-related funds and programmes are working to address access issues, as recently done by the Green Climate Fund and the on-going work to ensure mutual recognition to entities of the Global Environment Facility, Green Climate Fund and Adaptation Fund. However, there is growing recognition that efforts to address these issues fall short and that structural issues go beyond the design of individual funds. Environmental and credit ratings of individual countries, for example, have also been identified as potential barriers of accessing funds if a financing is offered as credit (OECD, 2021^[24]). In response to these perceived shortcomings of the international development financing architecture (UK Government, 2021^[59]; LIFE-AR, 2019^[60]), different stakeholders are highlighting the urgent need for enhanced and simplified access to development finance to complement the provision and mobilisation of climate-related development finance.

Relatedly there is an increasing recognition that there are many benefits of enhanced collaboration and coherence between climate and disaster risk reduction communities (OECD, 2020^[61]; Haque et al., 2018^[62]). Policy coherence for sustainable development viewed as a process of co-ordination can occur on a continuum – from the strategic to operational and technical levels (OECD, 2020^[61]; OECD, 2021^[24]). While investing in increased coherence can improve efficiency and effectiveness, it may also render processes to enhance individual policies more difficult (Dazé, Terton and Maass, 2018^[63]). Actual or perceived mismatches often hinders achieving the aim of coherence. Mismatches can be due to several factors. For example, the different institutional histories of the two approaches have contributed to separate institutional structures and funding mechanisms with different operational timescales. The immediate disaster response, for example, may be short term, whereas climate action requires long-term thinking (OECD, 2020^[61]). Indeed, despite recent increases in funds for *ex ante* measures, the current global system remains focused on response rather than anticipation (Weber and Musshoff, 2021^[64]). This is despite anticipation of risks making relief and recovery less costly (OECD, 2021^[24]).

There is also a need for increased coherence between approaches to manage climate risk and the strategies promoted through the humanitarian community. Humanitarian assistance plays an important role in response to extreme events. It takes the form of relief, as well as in-kind support such as food, water, medicines and tents. While post-disaster humanitarian assistance from donors is crucial, the timing and volume can be unpredictable and slow to mobilise, thus difficult to plan with (Bowen et al., 2020^[65]). Development co-operation providers can help partner countries manage the risks of climate-related losses and damages in several ways. First, they could use more predictable and flexible financing to meet immediate humanitarian needs. Second, their interventions could adapt to changing circumstances and future climate risks (Bowen et al., 2020^[65]; OECD, 2021^[66]). Providers are also increasingly integrating anticipatory action into development (German Federal Foreign Office, 2020^[67]; Levine et al., 2020^[68]; Kuriyama et al., 2020^[69]) and humanitarian programmes (UK Government, 2021^[70]).

Development co-operation providers face a trade-off between rapid humanitarian assistance and support for recovery versus medium- to longer-term investments to achieve sustainable development (Fanning and Fullwood-Thomas, 2019^[71]). Yet development co-operation providers often plan and implement their development interventions, including on climate change, separately from their humanitarian assistance. Different teams or agencies frequently manage the two types of support according to distinct rules, decision-making processes, programming cycles and budget envelopes (OECD, 2019^[72]). With mounting losses and damages, the need for greater collaboration across humanitarian and development actors is increasingly recognised (United Nations, 2016^[73]). In fact, collaboration between the humanitarian and development co-operation communities will require more synergies. Providers must respond to people's

immediate needs, while contributing to their resilience in the wake of both already experienced and projected hazards, which will also help ease the future burden of public finances. They can do this by planning and investing early in preparedness, through their choices of programming, and through early and sustained engagement with local capacities (OECD, 2021^[24]).

In May 2022, the G7 Foreign Ministers issued a statement committing to embedding anticipatory action into the humanitarian system and increasing the availability of corresponding financial resources (G7 Foreign Ministers, 2022^[74]). The commitment includes designing and developing innovative risk analytics, modelling for anticipation as well as investment in coordination and infrastructure to allow for data and model sharing. The commitment also emphasises the importance of locality-specific knowledge and the agency of local actors for successful implementation.

In co-ordination with various policy communities, multilateral organisations such as the IMF, World Bank and the OECD have a crucial role to play. These organisations can provide a platform for discussions, become a focal point for coordination, and anchor the agreements. For example, for donors the OECD Development Assistance Committee helps set international principles and standards for development co-operation, and track how donors deliver on their commitments. They also have experience in experimenting with supporting the implementation of innovative approaches to risk management, piloting them and scaling them up (catastrophe bonds, for example). They can offer a holistic framework to resolve these challenges posed by climate risks in a way that reinforces global financial resilience.

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Notes

¹ The capacity of households, businesses and subnational governments to absorb losses and damages depends on their income/revenue, access to savings, existing debt levels, access to debt financing on reasonable terms and, in the case of subnational governments, the ability to reallocate funds or raise additional revenues (OECD, 2012^[36]). The existence of insurance coverage that will respond to the losses and damage incurred also increases the absorptive capacity of households, businesses and governments, subject to deductibles or insured limits applied.

² Subnational government and corporate borrowers have traditionally faced a “sovereign ceiling” in the determination of their own credit risk (and therefore cost of borrowing) – where a subnational government or corporate borrower cannot have a credit rating above the sovereign rating. While many credit ratings agencies have moved away from a mechanistic application of a sovereign ceiling, it is still rare for subnational governments and corporate borrowers to be rated above the sovereign issuer. As a result, a downgrade in the sovereign credit rating continues to impact the ratings and cost of debt financing for subnational governments and businesses.

³ There is some (limited) evidence that the contribution of insurance to absorbing losses and damages for climate-related perils is declining in some regions. In a number of OECD countries, including Australia, Italy, Greece, Mexico, Poland, Mexico and Slovenia, the share of flood losses that was insured was lower in 2010-2019 than the overall average for those countries between 1990 and 2019 (OECD, 2021^[33]). A number of OECD countries have made – or are considering making – interventions to support the availability of affordable insurance coverage for climate perils (including Australia (cyclone and related flooding), Canada (flood), Ireland (flood), United Kingdom (flood) and the US states of California and Oregon (wildfire)) (OECD, 2021^[33]).

⁴ At least two of the major credit ratings agencies have undertaken analyses of the potential impacts of physical climate risks on sovereign credit ratings (Standard & Poor’s Ratings Service, 2015^[76]) (Moody’s, 2021^[77]).

⁵ Risk transfer to international markets also ensures that some portion of the losses from a catastrophic event to be absorbed by international markets (and investors), diversifying the burden away from the domestic financial system. One OECD analysis found that, in countries where higher levels of risk were transferred to international reinsurers, post-event recovery occurred more quickly while those countries with lower levels of reinsurance coverage struggled to recover (OECD, 2018^[75]).

⁶ In OECD countries, the share of flood losses and damages insured between 2000 and 2019 was approximately 55% to 63% in countries where flood coverage was automatically included in standard property insurance, 27% to 48% in countries with mortgage-related flood insurance requirements and 23% to 32% in countries with no such requirements. In India and Myanmar, despite similar levels of insurance penetration, a significantly higher share of climate losses and damages have been insured in India (10%-18%, relative to 1% to 6% in Myanmar, 2000-2019) where coverage for Storm, Typhoon, Cyclone, Tempest, Tornado, Hurricane, Flood or Inundation is automatically included.

⁷ A number of catastrophe risk insurance programmes intentionally apply flat (or relatively flat) premium structures which ensures affordability and also supports solidarity across the country. Many of these programmes make other contributions to risk reduction, including direct investment in prevention as well as other approaches to incentivising risk reduction (e.g. through the application of deductibles that account for risk). A recent OECD analysis found limited evidence of significant subsidisation at the programme-level as most (but not all) programmes have sufficient financial capacity to respond to annual and extreme losses without calling on government financial support (OECD, 2021^[33]).

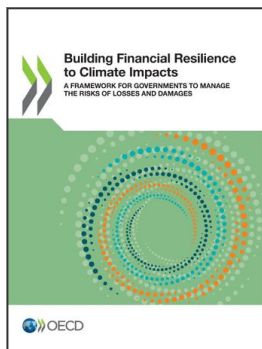
⁸ In countries with catastrophe risk insurance programmes (Algeria, Denmark, France, Norway, Romania, Spain, Switzerland and the United States for flood losses and France, Norway, Spain, Switzerland and the United States for storm losses), the share of flood losses insured was approximately 35% (relative to 16%) and the share of storm losses insured was approximately 54% (relative to 36%).

⁹ A number of catastrophe risk insurance programmes regularly assess the cost-sharing arrangements between the public and private sectors and make adjustments to the arrangements to changes in private market capacity (e.g. the terrorism risk insurance programmes in Australia, United Kingdom and United States as well as the earthquake risk insurance programme in Japan).

¹⁰ Climate change also creates new uncertainties as a result of changes to the climate parameters that drive the occurrence of floods, storms, droughts, wildfires and other climate-related perils which insurers and reinsurers will need to account for in the premiums they collect.

¹¹ A number of OECD countries have made – or are considering making – interventions to support the availability of affordable insurance coverage for climate perils (including Australia (cyclone and related flooding), Canada (flood), Ireland (flood), United Kingdom (flood) and the US states of California and Oregon (wildfire)) (OECD, 2021^[33]).

¹² For example, risk transfer necessitates an investment in risk quantification that can also be applied to the development of insurance markets for households and businesses and in decision-making on risk reduction and adaptation investments.



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