DEMYSTIFYING PRE-ARRANGED FINANCING FOR GOVERNMENTS:

A STOCKTAKE OF FINANCIAL INSTRUMENTS FROM INTERNATIONAL FINANCIAL INSTITUTIONS

CENTRE FOR DISASTER PROTECTION

REPORT

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About the Centre

The Centre for Disaster Protection works to prevent disasters devastating lives, by helping people, countries, and organisations change how they plan and pay for disasters.

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EXECUTIVE SUMMARY

Extreme weather and geophysical hazards are affecting the lives of billions of people across the globe, demanding much greater investment in resilience, and in more rapid and effective action when disaster strikes.

Traditionally, governments and the international community have taken a reactive approach. They have focused on more immediately pressing development issues in the near term, only allocating financial resources for disasters after an event rather than pre-arranging financing for predictable and modellable risk. Pre-arranged financing (PAF) provides financing that has been approved in advance of a crisis and is released when pre-identified trigger conditions are met. Despite growing, only 1.1% of total crisis financing flows financed by international development finance in 2022 was pre-arranged compared with 0.5% in 2017 (Plichta and Poole 2024).

Spurred by the existential threat climate change poses, there is increasing emphasis on international partnerships that support governments to reduce risk and prepare in advance for disasters. Robust preparedness requires comprehensive financial planning. When a disaster strikes, such planning is critical in ensuring that adequate financing is available to deliver prompt and sufficient support to reduce negative impacts on lives, livelihoods, and economic and fiscal outcomes.

This recognition has triggered the development of a series of new PAF instruments and related tools and approaches. Governments, multilateral development banks (MDBs), bilateral donors, UN agencies and humanitarian organisations have all contributed, working in close conjunction with the global insurance industry and applying risk modelling techniques. PAF instruments are also being discussed as part of the toolkit for addressing climate change-induced loss and damage.

There is no single 'best' PAF instrument. Each instrument offers certain attributes – and often certain shortcomings, at least in delivery. Conventional wisdom among disaster risk financing practitioners is that governments should develop national disaster risk financing strategies that combine different instruments (domestically and externally financed), typically ordered by their supposed appropriateness to shocks of different frequencies. Most generic layered risk finance diagrams usually include contingency funds and contingent loans at the bottom of the stack for medium- to high-frequency events of lower severity, while insurance and other types of risk transfer are situated at the top for major events. However, each country is different. Whether a particular instrument is efficient for a particular risk layer is extremely sensitive to specific economic and commercial factors, and to instrument design, including the level of subsidy, which can vary from year to year

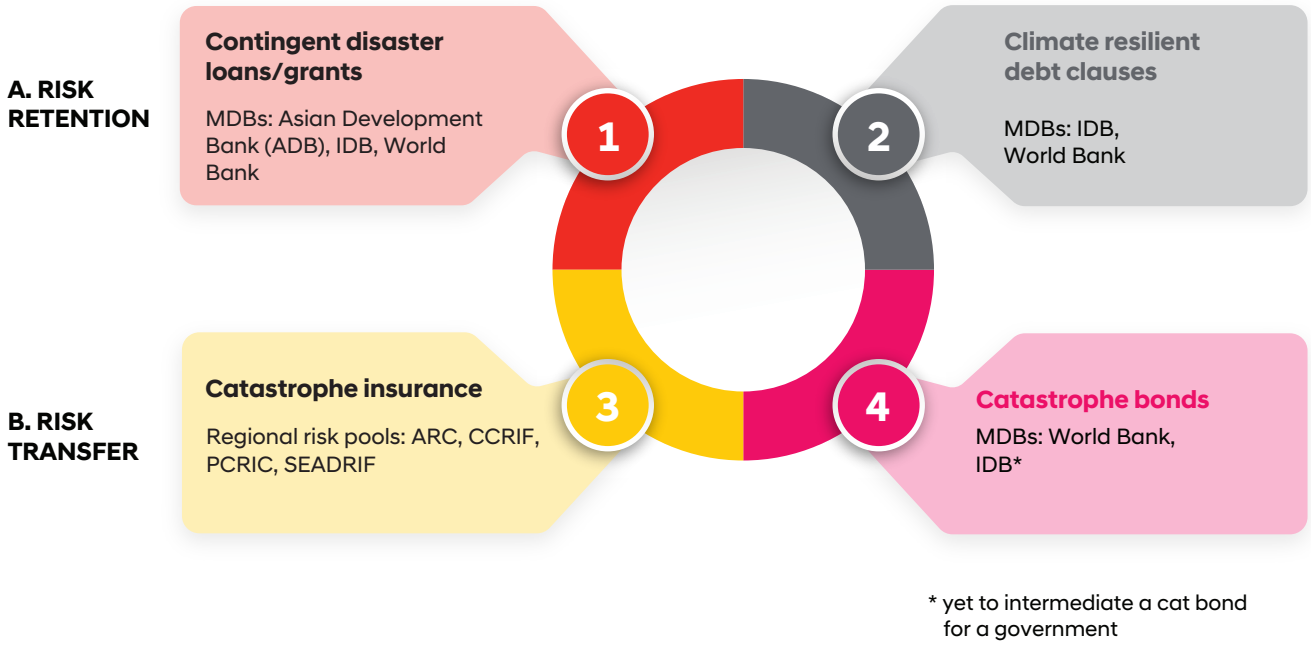
(Clarke et al. 2017; Haq et al. forthcoming). Moreover, the optimal mix of products for a country depends on the broader political and operational context. What may be appropriate for one country may not be a particularly effective option for another.

Many government officials and other stakeholders are currently not yet well equipped to critically evaluate different instruments in this relatively niche, complex and rapidly evolving space. Government officials are often armed with incomplete information and expertise, uncertain which instruments to take up first or how to apply them in combination. Some governments have met with disappointment as a result of unexpected outcomes and, in certain cases, misplaced expectations, leading to losses of trust and confidence both in particular instruments and in PAF more broadly.

Purpose of report

This stocktake intends to inform governments, development partners and wider civil society about the key features of available sovereign-level instruments and their performance, successes and limitations to date based on clearly defined criteria. The assessment focuses on the main types of internationally supported PAF currently available to governments. It covers contingent disaster loans and grants from MDBs, catastrophe (cat) bonds intermediated by the World Bank and sovereign (catastrophe) insurance offered by regional risk pools. It also partially covers a newer instrument that is garnering increasing attention and commitment from a range of international actors: climate resilient debt clauses (CRDCs).

Figure i: PAF instruments from international financial institutions in this report



* yet to intermediate a cat bond for a government

Box i: Seven criteria for assessing performance of PAF instruments

Drawing on publicly available evidence and key informant interviews from international financial institutions, the stocktake assesses the performance of these instruments against seven criteria that are widely seen as essential for ensuring that PAF reduces the human and financial costs of disasters:

attractiveness, examining country uptake and retention;

affordability, exploring the direct cost to governments;

financial efficiency, capturing value for money based on the full economic cost to governments relative to the expected payout as well as donor support;

timeliness, assessing how promptly financing is disbursed;

predictability, considering whether disbursement of the financing is assured when a crisis strikes;

evidence of contribution to wider **resilience building** beyond financial preparedness; and

evidence of **development impact**, through contributions to fiscal stability, and protection of poor and vulnerable groups.

The report does not seek to recommend a specific instrument or combinations of instruments for a specific country or group of countries. Governments, however, can use the findings to make better informed choices and ask better informed questions when engaging with the providers of these instruments.

Synthesis of findings

The core rationale for PAF instruments is robust and increasing focus on them justified, particularly in the face of climate change and the associated increase in the frequency and intensity of extreme weather events. While the stocktake reveals several emerging good practices that make instruments more affordable and reliable, it also highlights critical areas for improvement to ensure they are fit for purpose.

Finding 1: all the instruments assessed are designed to reduce the fiscal vulnerability of governments to disasters by rapidly providing liquidity following the occurrence of eligible events; most have a proven track record of delivering against this intended purpose. This makes them suitable for financing response, early recovery and reconstruction as defined in this paper (as summarised in Table i). The main exception are CRDCs, which are still relatively new and have only been triggered in 2024 for two countries to date (in loans from a MDB and an international bond).

Disbursements from MDB contingent disaster loans and grants, as well as insurance payouts from one of the four regional risk pools, the Caribbean Catastrophe Risk Insurance Facility (CCRIF), tend to be the quickest and most predictable in reaching governments' accounts after a qualifying event. In contrast, cat bonds issued via the World Bank, specifically for tropical cyclone, and sovereign catastrophe insurance from African Risk Capacity (ARC), specifically for drought, have a more mixed track record. This is due to bottlenecks in the reporting and verification process for their related parametric triggers, and for some ARC policies, a mismatch between the model and losses experienced on the ground.

Table i: Timeliness of PAF payouts and disbursements to governments

Instrument/provider	Early action	Response	Early recovery	Reconstruction
Contingent disaster loans/grants				
ADB (CDF)	🔴	🟢	🟢	🟢
IDB (CCF)	🔴	🟢	🟢	Not applicable
World Bank (CAT DDO)	🔴	🟢	🟢	🟢
Climate resilient debt clauses				
IDB	🔴	⚫	⚫	⚫
World Bank	🔴	⚫	⚫	⚫
Cat bonds				
World Bank	🔴	🟠	🟠	🟢
Sovereign insurance				
ARC	🔴	🟠	🟢	🟢
CCRIF	🔴	🟢	🟢	🟢
PCRIC	🔴	🟢	🟢	🟢
SEADRIF	🔴	⚫	⚫	⚫

Legend: green = good; amber = fair; red = poor; grey = not rated due to insufficient information.

Note: While the Inter-American Development Bank (IDB) Contingent Credit Facility would be scored as 'good' for reconstruction based on this metric, IDB eligibility rules preclude its use to finance reconstruction and it is therefore rated as 'not applicable'.

Source: Centre for Disaster Protection.

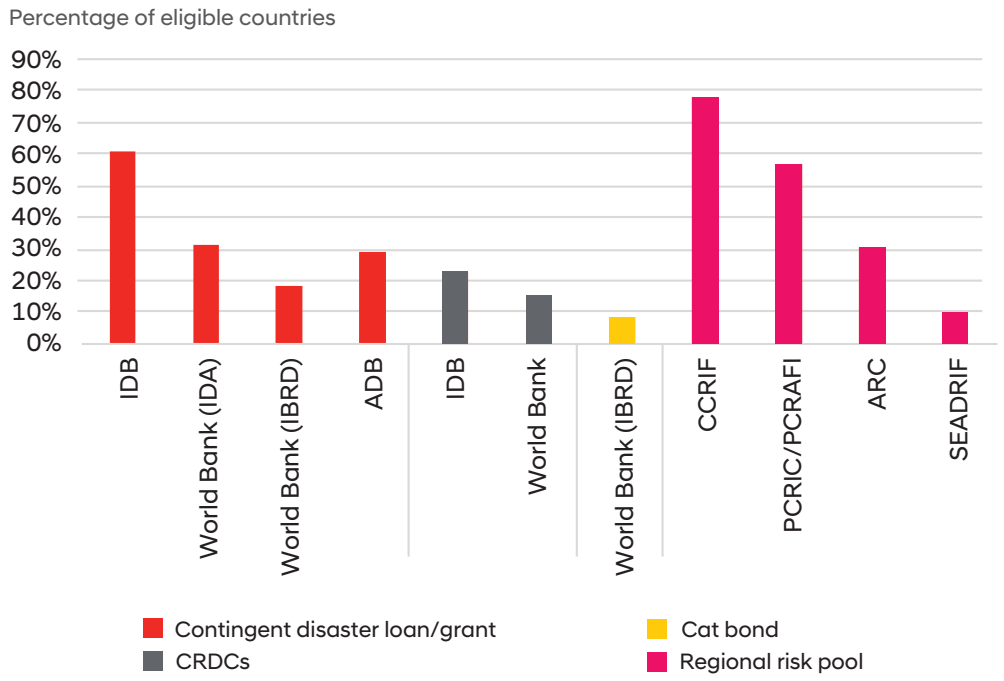
Finding 2: recognising that basis risk can undermine the credibility of an instrument, most providers are taking explicit steps both to manage basis risk and clients' expectations regarding instruments' timeliness and predictability. They are improving the quality of underlying models (Inter-American Development Bank (IDB) Contingent Credit Facility (CCF), cat bonds and regional risk pools); building governments' understanding of the models and the potential sources of basis risk; formally introducing some degree of flexibility in payout decisions (CCRIF and the Southeast Asia Disaster Risk Insurance Facility); and including secondary triggers and pre-agreed fail-safes (cat bonds and World Bank CRDCs).

However, it is currently not possible to assess the impact of these measures using information in the public domain. Governments and development partners should aspire to make information on trigger structures as well as analyses of basis risk publicly available to facilitate learning and public scrutiny.

Finding 3: while there is an upward trend in the uptake of most of these instruments, uptake and coverage are still relatively low (as shown in Figure ii) except in Latin America and the Caribbean. Development partners are taking measures to tackle affordability, one of the main barriers to scaling-up PAF. Recognising the limited fiscal space in many lower-income and climate-vulnerable countries, development partners have recently taken steps to reduce the direct cost of instruments to governments in those countries.

The two instruments that have been most heavily subsidised are contingent disaster grants and concessional loans from MDBs, specifically from the World Bank for countries eligible for International Development Association (IDA) support, and sovereign catastrophe insurance from two of the regional risk pools, ARC and the Pacific Catastrophe Risk Insurance Company. Eligible countries can also access more grants and concessional loans beyond their country allocation from the World Bank and Asian Development Bank (ADB) for contingent disaster financing purposes.

Figure ii: Uptake of PAF instruments between inception and 2023



Source: Centre for Disaster Protection

Note: CCRIF country-level data is available up to 2022.

However, in practice, the concessionality of MDB loans and risk pool policies varies across countries and time, and limited publicly information is available to analyse this.

Moreover, while premium support for sovereign insurance is increasingly available for risk pool members, this support tends to be smaller in aggregate and less predictable compared with a country's access to grants and concessional loans from MDBs. Some experts express concern that development partner support tied to particular instruments may skew governments' choices, leading them to choose the cheapest instrument rather than the instrument best suited to their needs or, in some cases, weakening incentives for disaster risk reduction.

Ensuring that scarce international public finance is used to create effective solutions that meet the needs of governments and intended beneficiaries is key. This requires governments and intended beneficiaries to play a key role in deciding how to allocate international public finance to address their needs. Some development partners are attempting to adopt a more demand-led and coordinated approach in the context of PAF. For example, the Global Shield against Climate Risk is currently using an in-country process in 13 countries to develop a tailored package of PAF. The Global Shield plans to undertake learning and evaluation to inform iterative improvements to its process, which may also provide valuable lessons for the wider disaster financing community on the opportunities and challenges in supporting country-owned solutions in this space.

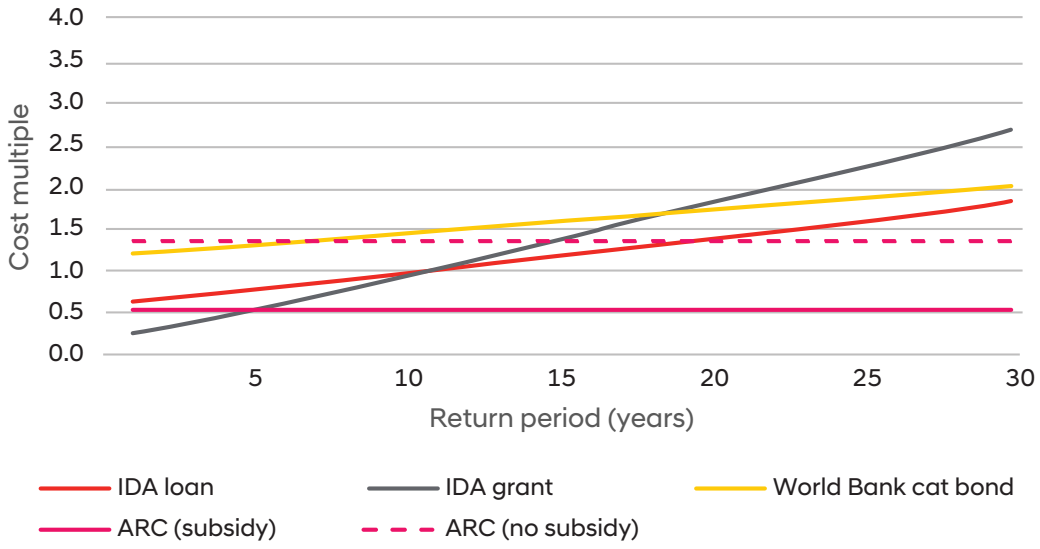
Finding 4: different PAF instruments entail different opportunity costs to governments that may not be immediately obvious. While most international discussion tends to focus on whether a PAF instrument is a grant or loan and who pays, there is less focus on the full economic cost to governments, including the opportunity cost. This is the cost of an alternative use of the finance that a government must forgo to take up a particular instrument and goes beyond the interest rate for a loan or the premium paid for an insurance policy. For example, an International Bank for Reconstruction and Development (IBRD) member country using its country lending envelope to access a contingent loan has to forgo drawing down that amount immediately for other purposes. This is expensive for countries with

limited headroom and where the IBRD loan is likely cheaper than alternative sources of finance.

To analyse the full economic cost to governments of different instruments, we assessed the cost multiple of each instrument based on several simplifying assumptions (Haq et al. forthcoming). This indicator provides a simple view of the relative costs to countries of using different instruments. It shows the average cost to a country for one unit of payout from an instrument on average and depends on the likelihood of the instrument being triggered. While the cost multiple will tend to increase with less frequent events for all instruments, analysis of representative instruments shows that this happens at different rates (as shown in Figure iii), meaning that some instruments may be more attractive for more frequent shocks and others for less frequent shocks. In the absence of other considerations, a government seeking to adopt the most cost-efficient financial strategy should select the instruments with the lowest cost multiple at each return period.

Development partners creating and supporting PAF instruments should carefully assess the cost multiple of instruments to governments and ensure the governments understand the trade-offs. The analytical framework used in this paper to estimate cost multiples can help ensure this assessment is transparent and robust (see Haq et al. forthcoming, for further details). Furthermore, government officials should be trained to understand the results of the type of analysis as well as its limitations in capturing certain factors, which may be important to the government but are not easily quantifiable. The analysis should also be publicly available to ensure public scrutiny and deepen the technical understanding of these instruments across a wider range of stakeholders.

Figure iii: Comparing cost multiples of potential PAF instruments in Africa



Note: Cost multiple at 5% discount rate. Simplifying assumptions, including the ARC risk multiple from Kramer et al. (2020) may not reflect the actual terms and conditions available to a specific country.

Source: Haq et al. forthcoming

Finding 5: with few exceptions, there is limited robust evidence that sovereign-level PAF instruments are benefitting poor and vulnerable households and communities or building broadly defined resilience.
The majority of instruments in this report essentially provide governments with quick general budget support; while governments, particularly ministries of finance, typically value this flexible, unearmarked support highly, it means that the use of funds cannot be tracked.

IDB's Contingent Credit Facility (CCF) and ARC's insurance products are the two main exceptions, with both instruments having explicit rules and processes governing the use of funds. While these two instruments give recipient governments less discretion, they have the advantage of incentivising actors to plan ahead of disaster and providing a clear line of sight between the use of funds and their impact on reducing the consequences of eligible events. Moreover, this information on the use of funds is publicly available via IDB's project completion reports, which are completed for loans that have been disbursed, and ARC's independent evaluations. According to evaluations by ARC (OPM 2022) and IDB (IDB 2023b), partnerships with humanitarian organisations such as the World Food Programme have been effective in ensuring that PAF at sovereign level reaches poor and vulnerable households in a timely manner, enabling targeted households to avoid negative coping strategies.

In contrast, given the budget support nature of the contingent disaster loans and grants from the World Bank and ADB, their project completion reports focus on the progress (or lack of progress) of policy actions tied to instruments to strengthen a government's disaster risk management (DRM) capacities rather than on the use of funds. These policy actions are often assumed to indirectly benefit poor and vulnerable groups, who are disproportionately affected by disasters, by strengthening country systems and planning to reduce disaster risks and/or by facilitating better and faster disaster responses. These policy actions may also enhance the effectiveness of other PAF instruments. For example, weaknesses in countries' public financial management systems have undermined the efficacy of ARC's contingency plans in several instances (OPM 2022).

However, there is limited evidence of the development impact of these policy actions. The results framework of MDB contingent disaster loans and grants has tended to measure outputs or processes rather than the impact of policy actions on DRM or poverty reduction goals more broadly.

Ultimately, development partners working with governments to design PAF solutions with the primary objective of reaching poor and vulnerable households or building resilience more broadly should have a clearly defined theory of change. Moreover, development partners should ensure that the product design reflects the theory of change; that data is collected and analysed to test all or parts of that theory and potential points of failure; and that critical lessons learnt are used to improve the instrument. This should be done in a way that minimises the burden of data collection and reporting on recipient governments.

1

INTRODUCTION

1.1. Context

Extreme weather and geophysical hazards are already affecting the lives of billions of people, with extreme weather posing an increasing threat to future generations as their frequency and intensity increase with climate change (IPCC 2023). Exposure and vulnerability to these hazards are also increasing as populations and economies expand in hazard-prone areas with insufficient regard for natural hazards, including in the design and location of buildings and other infrastructure.

These trends demand much greater investment in disaster and climate resilience to ensure that development gains persist through crises. They also require significant improvements in preparedness and response. As part of related efforts, actors at international, regional and national levels are placing greater emphasis on comprehensive financial planning for disasters, drawing on a range of disaster financing instruments. These include instruments that secure funding ahead of time but are disbursed only when a pre-defined event occurs (PAF) and instruments that mobilise funding after an event (ex-post financing) (Table 1).

Table 1: Types of disaster financing

Pre-arranged financing	Ex-post financing
Contingency reserves/disaster funds	Public borrowing
Contingent disaster grants and loans	Most international assistance
Climate resilient debt clauses	Budget reallocations
Insurance	Taxation
Catastrophe bonds	

Source: Centre for Disaster Protection.

Within these categories of instruments, there is no single 'best' instrument. Each offers certain attributes and, often, certain shortcomings, at least in delivery if not in intention as instruments may not be applied to their best effect. Moreover, their relative advantages and disadvantages depend in part on the particular riskscape they are intended to address, as determined by the type, frequency and intensity of potential hazards faced, the vulnerability and exposure to those events, and the country context. Levels of development, systems of government, and near-term considerations such as fiscal balances and levels of indebtedness are also relevant in determining the optimal mix of instruments, not least the relative balance of PAF and ex-post instruments. Governments are therefore usually advised to take a strategic approach to financial protection by combining different instruments in a disaster risk financing strategy, based on an assessment of their individual riskscape and associated contingent liabilities and fiscal risks.

The reality is that ex-post instruments have dominated how governments and development partners pay for disasters. Internationally supported PAF accounts for a very small proportion of total crisis financing – 1.1% in 2022 according to the latest assessment of PAF by the Centre for Disaster Protection (Plichta and Poole 2024). Despite the highly discretionary and unpredictable nature of ex-post instruments, structural disincentives have tended to prevent governments and international actors from prioritising financing for forward planning for disasters. Scaling-up PAF is therefore not simply a technical challenge. It reflects a need to generate necessary political incentives to make fiscal resilience a priority issue for governments.

Over the past 15 years or so, political momentum and commitment have grown at international level to correct this imbalance, with many new and promising tools, instruments and approaches emerging to pre-arrange financing from a wide range of actors – governments, multilateral development banks (MDBs), bilateral donors, UN agencies and humanitarian organisations. Development partners have also identified such instruments as an important part of the toolkit for addressing climate change-induced loss and damage (UNFCCC 2023). This is due to the recognition that, if designed and implemented effectively, PAF has the potential to significantly increase the predictability, speed and effectiveness of responses to shocks, in turn reducing their human and financial costs.

While helping countries better prepare for and respond to shocks is high on the international agenda in the humanitarian, climate and development finance space, several aspects of the PAF architecture are still relatively new, niche and complex. Consequently, many actors, including government officials, currently lack the requisite knowledge and practical experience of these instruments, particularly those which are not in the traditional form of grants and loans.

1.2. Research objective

The report's primary objective is to demystify PAF by providing a high-level assessment of the performance of the main PAF instruments that MDBs and regional risk pools offer to governments. The report does not seek to conclusively assess the strengths and weaknesses of each instrument from each provider, nor to recommend a specific instrument or combinations of instruments. Instead, it focuses on taking stock of lessons learnt and emerging good practices from three main types of PAF instruments offered to governments, plus early insights from the newly introduced climate resilient debt clauses (CRDCs). Although CRDCs are not yet widespread, they are also included as several MDBs have started to offer these clauses and others are actively exploring them. The report covers the following instruments:

- contingent disaster grants and loans from MDBs
- CRDCs from MDBs
- catastrophe bonds (via MDBs)
- sovereign insurance (via regional risk pools).

1.3. Research approach

The underlying normative framework for the stocktake comprises seven criteria. These criteria are shaped by principles typically seen as critical for ensuring that PAF reduces the human and financial costs of disasters.

The seven criteria for the comparative assessment are summarised in Box 1 (and are described in further detail in Section 4):

Box 1: Seven criteria for assessing performance of PAF instruments

Attractiveness: the instrument is relevant to the country's needs and priorities and is therefore being used by governments to provide coverage against future disasters.

Affordability: the instrument is affordable based on direct cost to the government, as reflected in the average grant element and fees of the contingent loans, risk multiples and the availability of premium subsidies for the two risk transfer instruments.

Financial efficiency: the instrument offers good value for money for the government relative to alternatives.

Timeliness: the instrument provides financing sufficiently promptly for each stage of funding need – early action, response, early recovery and reconstruction, and funds provided are used by governments in a timely manner based on clear time frames.

Predictability: governments perceive the instrument – particularly the underlying pre-agreed triggers – to be reliable, providing assured funding when there is a crisis.

Evidence of resilience building: the instrument enhances a country's resilience to shocks by supporting risk reduction, preparedness, building back better, and risk understanding and knowledge.

Evidence of development impact: the instrument supports macroeconomic and fiscal stability and/or protects poor and vulnerable groups based on available evidence.

An important caveat is that some of the criteria may not be equally relevant for all the instruments in practice, given their differentiated intended purposes and deliberate design choices relating to the specific countries and perils targeted. For example, the Inter-American Development Bank (IDB)'s contingent disaster loans from its Contingent Credit Facility (CCF) are designed to cover disaster response and restore basic services to the population, and not reconstruction. In addition, the report does not consider how these instruments are complemented by more traditional instruments. For example, it does not examine the extent to which ex-post disaster financing instruments complement ex-ante instruments, nor how regular investment loans and technical assistance contribute to risk reduction. It is therefore important to interpret the assessment criteria and findings of this report within this broader context.

The assessment is primarily based on desk-based research and semi-structured interviews with the main providers of PAF covered in this report, specifically MDBs and regional risk pools (see Annex 1). The report also benefitted from feedback from various disaster risk financing experts at a workshop during the Climate Risk Finance Forum conference in April 2024. However, the perspectives of recipient governments were not obtained for this report and will be the focus of subsequent Centre research.

The rest of the report is structured as follows. Section 2 provides an overview of the main internationally supported PAF instruments from MDBs and regional risk pools that governments use to retain and transfer disaster risks. Section 3 provides an overview of coverage and payouts for these PAF instruments between 2017 and 2022. Section 4 briefly outlines the assessment framework. Section 5 discusses the results of the assessment against the seven key criteria. The conclusion discusses the key findings in terms of what is working and what needs to be improved, and recommends areas for further research.

2

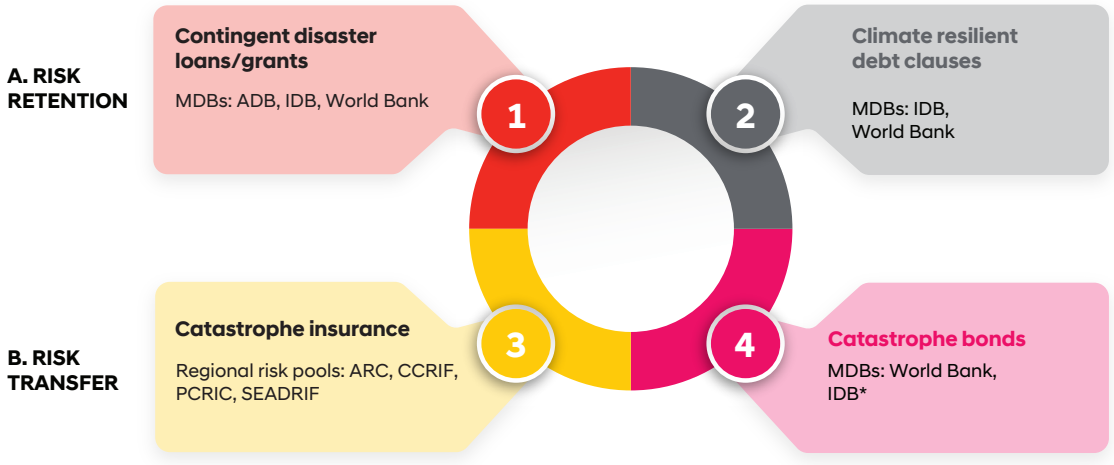
OVERVIEW OF PRE-ARRANGED FINANCING INSTRUMENTS

Over the past two decades, international institutions, national governments and risk pools have developed and implemented a range of tools to help countries mobilise rapid financing to prepare for and respond to disasters. This section highlights the key features of the main PAF instruments three MDBs and four regional risks pools offer. Despite being relatively new, CRDCs are included given the significant political momentum for a wide range of creditors to offer these clauses to governments.

These instruments can be divided into two categories:

1. **Risk retention** instruments require risk holders to pay for the full amount of the PAF to be triggered. The government may either pay before an event (e.g. by capitalising a disaster fund) or after (e.g. through a contingent loan that has to be repaid). In either case, a government retains the responsibility for covering the costs that arise following the event. This report covers two types of risk retention instruments from MDBs: contingent disaster loans and grants, and CRDCs.
2. **Risk transfer** instruments place the obligation for providing (a certain amount of) money in the event of a disaster onto third parties. The capital provider will receive a payment in exchange for accepting this risk. This report covers two types of risk transfer instruments: catastrophe bonds intermediated by MDBs and sovereign insurance from regional risk pools.

Figure 1: PAF instruments from international financial institutions in this report



* yet to intermediate a cat bond for a government

2.1. Multilateral development banks

Several large MDBs have gradually developed crisis finance preparedness and response toolkits that include PAF instruments for their client countries. The World Bank and IDB have been the most innovative and active, with the Asian Development Bank (ADB) also engaged to some extent. Other MDBs, such as the African Development Bank (AfDB) and Caribbean Development Bank, have also provided some form of contingent disaster loans and grants but at relatively modest levels. In addition, both regional development banks have also facilitated the uptake of PAF instruments from risk pools in their respective regions, but are not considered any further in this report.

Contingent disaster loans or grants

All three banks offer loans or grants that are prepared and approved in advance of an eligible event and made available following a disaster if the pre agreed (trigger) conditions are met. The World Bank was the first MDB to introduce a contingent disaster loan, establishing the Development Policy Financing (DPF)[1] with Catastrophe Deferred Drawdown Option (Cat DDO) in 2008 for its non-concessional lending to International Bank for Reconstruction and Development (IBRD) member countries. A concessional option for International Development Association (IDA) countries was introduced in 2017 (IDA Cat DDO). In 2009, IDB established the CCF for Natural Disaster Emergencies, which has become one of IDB's main tools for supporting borrower member countries to improve the financial management of disaster risk (IDB, n.d.). ADB was a little later to the table, approving its first contingent financing loan in 2016 via waivers to its standard policy-based loan (PBL) instrument. ADB formalised its contingent disaster loan and grant option under its PBL instrument in 2019 (ADB 2019a).

Prior to the approval of each of these contingent disaster loans and grants, all three banks require the borrower client to have a satisfactory disaster risk management (DRM) programme in place (or in preparation), which they will monitor periodically. Notably, while the World Bank and ADB require countries to have a positive macroeconomic assessment at the time of approval, this is not a condition for disbursement (as is required for regular DPF loans from the World Bank), recognising that crises could result in macroeconomic distress. However, to manage the risk of disbursing in an unfavourable macroeconomic environment and adversely affecting their balance sheets, each MDB has country limits on the scale of contingent disaster financing.

There are important differences between the contingent disaster loans from the World Bank and ADB on the one hand and contingent loans from the IDB on the other.

First, the loans from the World Bank and ADB are both PBLs, providing rapid liquidity in the form of budget support, which means governments have discretion over how funds are used once triggered. In contrast, the IDB loan is an investment loan. While the IDB CCF is also intended to provide quick disbursements, proceeds are exclusively used to cover extraordinary government expenditures incurred during 180–270 calendar days following the onset of an eligible event.

Second, the World Bank and ADB contingent loans both apply non-parametric triggers, commonly referred to as 'soft' triggers. These are triggers that are at the discretion of the funding recipient, rather than the funding provider or a third party, such as a government declaring a state of emergency. In contrast, the IDB CCF uses both parametric (Modality I) and soft (Modality II) triggers depending on the type of hazard. Soft triggers were introduced in 2019 to expand the scope of the CCF to include hazards that are expensive or otherwise challenging to reliably parameterise; for example, severe droughts and public health emergencies (IDB OVE 2020). A declaration of emergency is used to trigger disbursement under CCF Modality II.

Third, both the World Bank and ADB allow certain countries to finance these contingent instruments in part by accessing additional concessional financing from set-aside crisis financing grant windows, such as the World Bank's Crisis Response Window (CRW)[2] and ADB's Expanded Disaster and Pandemic Response Facility (DRF+), thereby topping up a country's concessional allocation. The IDB CCF does not have this option, with a CCF funded by redirecting undisbursed loan balances

1 Originally referred to as a Development Policy Loan with a Catastrophe Deferred Drawdown Option (DPL with Cat DDO).
2 Under 20th replenishment of the International Development Association (IDA), an IDA country's Development Policy Financing (DPF) Cat DDO is only financed by 25% of its country allocation, with 25% covered using crisis response window (CRW) resources and 50% covered by general IDA resources.

from previously approved operations (referred to as automatic redirection list), and/or by accessing new resources within a country's lending envelope.

Finally, both the World Bank and ADB have aggregate ceilings for their contingent disaster loan and grant instruments whereas IDB does not. This is likely because the CCF is an uncommitted facility; that is, no amounts are committed upon approval of a CCF operation (IDB OVE 2020). This means if a country intends to access new resources to finance its CCF, the availability of new funds for disbursement partly depends on whether there is space in the country's lending envelope at the time the country requests the resources. If not, a country has the option to use undisbursed balances. The World Bank and ADB also use aggregate ceilings to avoid overusing the allocation incentive, with some resources coming from outside the country envelope as described above.

Table 2 summarises the key features of each of these instruments.

Table 2: Key features of contingent financing instruments of the Asian Development Bank, Inter-American Development Bank and World Bank

	World Bank IBRD Cat DDO	World Bank IDA Cat DDO	ADB CDF	IDB CCF
Year established	2008	2017	2016/19	2009
Global limit	Yes	Yes	Yes	No
Country limit	Up to USD1 billion or 0.5% of GDP, whichever is less	Up to USD250 million or 0.5% of GDP, whichever is less[3]	For contingent disaster financing (CDF) financed using ordinary capital resources (OCR), up to USD500 million or 0.5% of GDP, whichever is lower; for concessional OCR lending and Asian Development Fund-financed CDF, up to USD250 million or 0.5% of GDP, whichever is less[4]	Modality I: up to USD300 million or 2% of GDP, whichever is less Modality II: up to USD100 million or 1% of GDP, whichever is less
Modality	Policy-based loan	Policy-based loan or grant	Policy-based loan or grant	Investment loan
Trigger	Soft	Soft	Soft	Modality I: Parametric Modality II: Soft

3 IDA clients with limits below USD20 million may request a Cat DDO up to a maximum of USD20 million.
4 Developing member countries with an access limit below USD20 million can access to up to USD20 million.

In addition to the contingent disaster loans and grants covered in this report, client countries have access to a range of other disaster financing instruments from these MDBs; in particular, from the World Bank, which introduced an expanded crisis response toolkit in June 2023 (World Bank 2023e). Some of these additional instruments, ex-ante and ex-post are briefly described in Box 2.

Box 2: Overview of multilateral development bank instruments not covered in stocktake

- **World Bank Investment Project Financing with a Deferred Drawdown Option** – this instrument differs from the above-mentioned Cat DDOs. It provides contingent financing for pre-specified expenditure for a range of potential unforeseen shocks, including disasters, and economic and financial shocks. In allowing for the redirection of undisbursed balances under investment projects, Investment Project Financing with a Deferred Drawdown Option (IPF DDO) resembles IDB's CCF, the main difference being that the World Bank requires ex-ante identification of specific contingent components as part of each individual project's approval. The IPF DDO may also be less attractive to IDA and IBRD countries compared with the World Bank's CAT DDOs as well as the IDB CCF. This is related to the opportunity cost associated with using these instruments. For example, 50% of the IPF DDO for an IDA country comes from that country's allocation compared with 25% for a Cat DDO (World Bank 2024e). IBRD countries also have to pay higher fees, comprising a front-end fee and stand-by fee.
- **Contingent emergency response components** – World Bank investment projects can include contingent emergency response components (CERCs) to address emergency recovery activities in the event of a disaster. CERCs can be fully funded at approval or, as has been more common, set as a zero-dollar project component with uncommitted project funds reallocated to the CERC if activated.
- **Contingent emergency response projects** – these World Bank instruments build on an assessment of a country's crisis preparedness and allow for the rapid reallocation and disbursement of emergency funding. In contrast to CERCs which are project components, contingent emergency response projects are stand-alone projects.
- **Support for development and implementation of country-specific sovereign and non-sovereign PAF instruments** – for example, the World Bank is supporting the Government of Mozambique to place disaster insurance policies in the market through the Mozambique Disaster Risk Management and Resilience Program (World Bank 2023b), while ADB is supporting the Government of the Philippines to develop a city government disaster insurance product (ADB 2020b). The World Bank's De-risking, Inclusion and Value Enhancement of Pastoral Economies in the Horn of Africa (DRIVE) project is supporting pastoralists to adapt to the impacts of climate change, and includes an index-based livestock insurance (World Bank 2022b).
- **Ex-post disaster financing** – The majority[5] of crisis financing provided by MDBs is mobilised after shocks occur (Plichta and Poole 2024). This support, which is often fast-tracked, remains a significant form of financing and generally surpasses disbursements from PAF instruments where these are in place as well. MDBs also provide ex-post support through existing projects and programmes via restructuring or the provision of additional financing already focused on relevant sectors. Some MDBs also offer small-scale, post-disaster, fast-tracked humanitarian assistance grants.

Source: Centre for Disaster Protection.

5 For example, between 2016, when the Asian Development Bank (ADB) approved its first contingent disaster loan, and 2023, ADB approved USD2.1 billion in emergency assistance loans, compared with USD1.2 billion in contingent disaster loan and grant approvals, and USD1.1 billion in contingent disaster loan and grant disbursements.

Climate resilient debt clauses

Climate resilient debt clauses (in MDB loans) are relatively new to the PAF toolkit; IDB was the first MDB to offer them, in 2021, followed by the World Bank, in 2023. A CRDC is a legal clause included in a debt contract that allows the temporary suspension of a government's debt payments if an eligible disaster event occurs. These clauses must be activated before the event occurs to avoid being considered a form of debt restructuring.[6] Unlike the other instruments covered in this report, CRDCs do not provide fresh financing to governments. Instead, they provide temporary liquidity relief by pausing debt service payments (the principal and/or interest) for a pre-agreed period, thereby freeing up fiscal space for the disaster response. As CRDCs are relatively new, with only one country triggering its CRDCs in its loans to a MDB, they are only partially assessed in this report, where this was feasible.

IDB's CRDC, referred to as the Principal Payment Option (PPO), has been included in Flexible Financing Facility loans to client countries since July 2021. Once activated by a country, the clause allows that country to postpone principal repayments for two years in the event of an eligible disaster. The country continues to pay interest and any other fees during the deferral period. While all countries are eligible for the CRDC, a prerequisite is that they must have an active CCF (described above), including coverage for at least one parametric disaster event. The perils covered by IDB's CRDC are earthquakes, hurricanes and excess rainfall. The CRDC employs a hybrid trigger involving both a binary parametric component linked to the CCF trigger and a soft trigger requiring the declaration of a national emergency. Both must be triggered to exercise a CRDC. IDB currently charges a transaction fee of five basis points per annum on the outstanding loan balance to cover operational costs.

In contrast, the World Bank's CRDCs can be used to postpone both interest and principal payments (and other charges) for up to two years (World Bank 2023a). They are currently only available to 45 countries, comprising IBRD- and IDA-eligible small state economies, members of the Small States Forum and small island developing states as defined by the UN. Event coverage is limited to tropical cyclones and earthquakes. Similar to IDB, the World Bank's primary triggers include a parametric trigger measuring the intensity of the disaster event. However, unlike IDB's PPO, there is a secondary trigger if the primary parametric trigger is not satisfied. This is based on whether estimated damage from an eligible event is greater than or equal to 10% of the country's GDP using the World Bank's Global Rapid Post-Disaster Damage Estimation (GRADE) approach. A government declaration of national emergency following the occurrence of a covered event is required before a CRDC deferral request is submitted to the World Bank. As of June 2024, World Bank CRDCs were offered to eligible borrowers at no cost, with donors covering the initial transaction fee of five basis points.

There are several similarities between the IDB and World Bank CDRCs. Both can only be triggered once over the life of a loan. Both can be included in new and existing loans once certain conditions are met.[7] Both maintain the cumulative weighted average of the loan, which means the original maturity of the loan cannot be extended and repayment will be accelerated after the deferral period. Both are expected to be triggered for low-frequency/high-severity events, which most likely positions them in the risk layer above the previously mentioned contingent disaster loans, which may be triggered for relatively lower-severity events, and below risk transfer instruments. Finally, CRDCs from both banks automatically expire five years prior to a loan's last amortisation payment date or once the CRDC has been exercised.

6 Activating a CRDC is different from exercising/triggering a CRDC when an eligible disaster event occurs.
7 For example, loans with a bullet maturity cannot benefit from a deferral of principal.

Table 3: Key features of climate resilient debt clauses offered by the Inter-American Development Bank and World Bank

	IDB	World Bank
Year established	2021	2023
Eligibility	All borrowing member countries	45 small states and small island economies
Direct link to other instruments	Yes; requires active CCF	None
Type of deferral	One-time deferral of principal repayments	One-time deferral of principal repayments, interest and loan charges
Duration of deferral	Up to 2 years	Up to 2 years
Perils covered	Tropical cyclones/hurricanes, earthquakes and excess rainfall	Tropical cyclones/hurricanes and earthquakes
Triggers	Parametric and non-parametric	Parametric
Transaction fee to government[8]	0.05% on outstanding loan balance	None (covered by donors)

Source: Centre for Disaster Protection based on IDB (2024c) and World Bank (2024c).

Catastrophe bonds

The toolkits of both the World Bank and IDB include cat bonds and cat swaps.[9] These risk transfer products are designed to provide protection against catastrophic events with low probability of occurrence but high economic impact. This report focuses on cat bonds as they have been more widely used (though cat bonds are sometimes issued together with cat swaps to provide countries with even larger coverage volumes).

A cat bond is a fixed-income security that pays periodic coupons to the investor during the life of the bond, insuring the sponsor of the bond against a predefined set of events such as earthquakes and tropical cyclones. In contrast to conventional bonds, they are triggered by a catastrophe if the reported event observation data meet pre-agreed criteria. Once triggered, the bond sponsor maintains a portion of the principal; consequently, investors lose a portion of principal and interest payments. In this way, they transfer catastrophe risk to investors. A cat bond is very similar to insurance, the key difference being that the principal is fully collateralised; that is, the total maximum payout from a cat bond is held in a collateral account until it is needed for payouts or returned to the investor at the end of the term. This reduces the risk of default if managed well. Sovereign cat bonds also typically apply parametric triggers with the aim of offering sponsors quick and transparent payouts.

Catastrophe bonds pay investors high returns to compensate for the risk of the issuer not having to repay the principal in the event of a major catastrophe. Another advantage to investors is that they offer returns that are uncorrelated with macroeconomic variables or, therefore, returns on other financial market instruments.

The main barriers to the uptake of cat bonds are their complexity and high cost (discussed in Section 5.2). Intermediation by the World Bank is intended to help governments navigate these challenges. The World Bank began supporting the preparation and issue of sovereign cat bonds in 2006 through its MultiCat programme. Through this programme, the World Bank Treasury

8 As of September 2024.
9 Swaps are contracts that market participants use to exchange (swap) fixed payments for a certain portion of the difference between insurance premiums and claims.

acted as arranger, allowing clients to sponsor cat bonds using a common documentation platform that sought to make issuance more efficient than doing a stand-alone transaction. This was replaced by the Capital at Risk Notes programme in 2014 which streamlined the process further by eliminating the need for a special purpose vehicle or a collateral arrangement. Instead, the World Bank takes on the role of financial intermediary, entering into risk transfer agreements with governments and simultaneously issuing sovereign cat bonds with matching terms to investors (World Bank 2022a). The World Bank invests the proceeds and manages payments to the sponsor and investors, charging countries a standard intermediation fee for its services. Proceeds are placed with general IBRD capital and used to support the financing of projects that promote sustainable development around the globe.

Importantly, cat bonds intermediated by the World Bank do not use a country's IBRD lending envelope. The risk transfer transaction is structured to avoid credit exposure to the sponsoring country with the country's catastrophe risk fully passed to investors through the issuance of the cat bond. Thus, there is no use of the World Bank envelope for the sponsoring country or a counterpart credit exposure.

IDB also offers catastrophe protection coverage through cat bonds, but no transaction has yet taken place.[10]

2.2. Regional risk pools

Regional risk pools are not-for-profit insurance companies. They were created to help countries access insurance and capital markets on competitive terms in pursuit of development objectives. Currently, four sovereign regional risk pools are in operation: CCRIF Segregated Portfolio Company (SPC) (formerly the Caribbean Catastrophe Risk Insurance Facility, henceforth CCRIF); African Risk Capacity Insurance Company Limited (ARC); Pacific Catastrophe Risk Insurance Company (PCRIC); and Southeast Asia Disaster Risk Insurance Facility (SEADRIF). Although these four risk pools provided coverage of USD1.4 billion to almost 40 countries in 2023, they have the combined potential to help up to 100 nations globally insure against climate and disaster risks.

A risk pool combines the individual risks of countries into a single, better diversified joint reserve mechanism. A portion of the pooled risks is retained through reserves. The pool then aims to transfer the risks it does not want by purchasing reinsurance and catastrophe swaps on competitive terms.

Their main advantages are the design and validation of products for a range of similar countries, facilitating joint learning and improving product design; their joint procurement function, providing governments with access to expertise in relation to purchasing international reinsurance expertise; and their ability to mobilise donor funding to pay for insurance premiums (Cebotari and Youssef 2020; World Bank 2017b).

While they share common features, the four pools are not identical in terms of the products they offer. Their insurance products are tailored to the specific risks and characteristics of the countries in each pool. These include tropical cyclone, drought, cyclonic wind, excess rainfall/flood, earthquake and tsunami risks. ARC has also added coverage of parametric outbreak and epidemic events. Although the perils may differ, all the risk pools' products have relied on parametric triggers given the objective of providing rapid, flexible funds within weeks of an event. Insured countries pay an annual premium commensurate with their own specific risk exposure and receive compensation based on the level of coverage agreed upon in the insurance contract upon the occurrence of a triggering event.

While this report focuses on their sovereign-level products, it is important to recognise that the risk pools, particularly ARC and CCRIF, are also offering non-sovereign level products to humanitarian organisations as well as micro- and meso-level parametric products or other products customised to the needs of specific members. ARC Replica programme allows UN agencies and other humanitarian actors to match ARC country insurance policies. Initially, a Replica policy could only be approved if the government also had an ARC policy, as a way of incentivising governments to take out a policy. However, ARC Replica and sovereign policies can now be delinked, providing greater flexibility in situations where a government is unable or unwilling to take out a policy. CCRIF is also working with the UN World Food Programme to link insurance payouts to social protection systems in several member countries.

Table 4 summarises the key features of each pool.

10 As of June 2024.

Table 4: Key features of regional risk pools

	CCRIF	ARC	PCRIC	SEADRIF
Year established	2007	2014	2016	2019
Form of insurance	Modelled loss parametric	Modelled loss parametric	Modelled loss parametric	Modelled loss parametric
Perils covered	Tropical cyclone, earthquake, excess rainfall	Drought, tropical cyclone, flood, outbreaks and epidemics	Tropical cyclone, earthquake and excess rainfall	Flood
Initial capitalisation	Multi-donor grant via World Bank	Interest-free loan (Germany and UK)	Multi-donor grant via World Bank	Donor grants
Independent publicly available evaluation	No	Yes	No	No

Source: Centre for Disaster Protection.

All four pools were set up with significant development partner support, both financial and technical. The World Bank was particularly heavily involved in the establishment of CCRIF, PCRIC and SEADRIF, both directly and via the establishment of multi-donor trust funds. In contrast, ARC was initially capitalised through interest-free loans from Germany and the UK, more recently drawing on support from a wider group of donors including through a multi-donor trust fund administered by the AfDB. Experts from the World Food Programme were also involved in setting up ARC. ARC, PCRIC and SEADRIF continue to rely on development partners for capital support. In recent years, ARC and PCRIC have also received significant premium subsidies from donors (see Section 5.2).

Regional political bodies, such as the African Union (AU), and Caribbean Community and Common Market (CARICOM) have played a central role in establishing the sovereign regional pools and creating a sense of ownership among members. The pools require strong political commitment from their member countries to work together for their mutual benefit before and after disasters. Although only ARC has a formal relationship with its respective regional political body, the AU, both CCRIF[11] and ARC[12] have used their own respective regional political organisations, CARICOM and the AU, to engage countries at the appropriate political levels. PCRIC traces its origins to a pilot insurance programme launched by the World Bank in 2013 under the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI). Following the close of the PCRAFI pilot programme in 2015, finance ministers from across the Pacific Region at the Forum Economic Ministers Meeting sought a commitment to establish a stand-alone facility to continue the insurance programme, leading to the formation of PCRIC. However, according to a World Bank report, PCRIC has suffered from a 'lack of strong political ownership' among its members in the region (World Bank, 2023c). Covid-19 also made it difficult for risk pools to engage with countries to grow and maintain their customer bases. Fostering strong

11 Following a devastating hurricane season in 2004, the Heads of Government of the Caribbean Community and Common Market (CARICOM) requested assistance from the World Bank to design and implement a cost-effective risk transfer programme for member governments. This marked the beginning of what would become the Caribbean Catastrophe Risk Insurance Facility (CCRIF).

12 ARC Ltd is part of the African Risk Capacity (ARC) Group, which is a Specialized Agency of the African Union established to help African governments improve their capacities to better plan, prepare and respond to extreme weather events and natural disasters.

regional ownership is therefore a priority for PCRIC and SEADRIF, both of which are still relatively new and less well known in their respective regions.

Despite being non-profit, risk pools are regulated insurance companies and therefore have to comply with minimum capital requirements set by their respective regulatory jurisdictions. Levels of capitalisation influence the scale of operation and extent of reliance on the reinsurance market, and can also potentially limit the scale of ambition.

Finally, it is worth noting that the UK's Foreign, Commonwealth & Development Office (FCDO) has commissioned a series of independent evaluations and impact assessments of ARC over the period 2015–2026, of which two evaluations have been completed and an impact assessment is ongoing. These evaluations are publicly available and referenced heavily throughout this report. No such arrangement currently exists for the other three pools and the assessment may disproportionately focus on ARC in some areas.

3

SNAPSHOT OF COVERAGE AND PAYOUTS BY INSTRUMENT AND REGION (2017-2023)

SUMMARY

- Out of all the PAF instruments in this report, contingent disaster grants and loans from the three MDBs provided by far the largest amount of ex-ante financial coverage and payouts in aggregate between 2017 and 2022.
- Coverage from sovereign cat bonds facilitated by the World Bank peaked in 2020, with five countries having coverage of roughly USD2 billion.
- Insurance coverage from the four regional pools steadily increased from USD891 million in 2017 to USD1.5 billion, with CCRIF accounting for the bulk of this, providing country coverage in excess of USD1 billion every year since 2020.
- Latin America and Caribbean account for the vast majority of annual coverage of all instruments combined, almost 80% on average between 2017 and 2023.
- There is no publicly available information on the expected and actual coverage provided by CDRCs in MDB loans.

This section reviews trends in coverage and disbursements/payouts to governments for the main sovereing-level PAF instruments provided by MDBs and regional risk pools between 2017 and 2023 (unless otherwise stated). Coverage is measured as the maximum amount of funds that are available should shocks of an agreed magnitude occur. Data is compiled from information extracted from MDB loan and grant agreements, and annual reports of regional risk pools, with additional information provided direct from some instrument providers.

Contingent disaster loans and grants via multilateral development banks

Out of all the PAF instruments discussed above, contingent disaster grants and loans from the three MDBs provided by far the largest amount of ex-ante financial coverage and payouts in aggregate between 2017 and 2023 (Figures 2 and 3).[13] Peak coverage was reached in 2020 at USD5 billion and dropped relatively little in 2021, despite significant drawdowns in response

13 For annual pre-arranged financing (PAF) instruments (i.e. the risk pool products), coverage is defined as the coverage provided under policies issued in the relevant calendar year. For multi-year PAF instruments (i.e. contingent disaster loans or grants and cat bonds), coverage is defined as the coverage provided under all pre-existing loans, grants and bonds as of 1 January of a particular year plus coverage of new loans, grants and bonds approved or issued in that year.

to covid-19. This was due to the World Bank quickly processing almost USD1 billion in new Cat DDOs in 2021 after disbursing USD1.7 billion in 2020. The drop in total MDB coverage between 2021 and 2022 reflects the full disbursement of two USD500 million ADB CDF loans in 2021, partly in response to covid-19 following a CDF amendment.[14] In contrast, only three IDB CCF loans were disbursed for three countries in response to the pandemic in 2020 and 2021, for a total amount of USD202 million (IDB 2023a, 2024a, 2024b).

IDB's total CCF coverage exceeded that of the World Bank's CAT DDOs and ADB's CDF in most years between 2017 and 2023, though its total disbursements were significantly less than the other two, largely because IDB's CCF is designed to disburse for less frequent events. Between 2017 and 2023, total disbursements from the World Bank, ADB and IDB amounted to USD3.4 billion, USD1.1 billion and USD357 million, respectively. Excluding loans disbursed for covid-19, roughly 30% of active IDB loans were partially disbursed within four years of loan approval over this period, whereas 45% of the active World Bank and ADB loans were fully disbursed within the first two years of loan approval.

Climate resilient debt clauses (in MDB loans)

No information is publicly available on the expected coverage provided for the six countries that activated CRDCs in loans from IDB and for the seven countries with World Bank CRDCs. As of September 2024, no information is publicly available on CRDCs in MDB loans that have been triggered. For example, there is currently no information on the size of liquidity relief from St. Vincent and the Grenadines exercising the CRDCs in its World Bank loans in 2024.

Although not related to an MDB loan, it is worth noting that the Government of Grenada has also triggered the CRDC in its restructured sovereign debt to private creditors following the devastation of Hurricane Beryl in July 2024 (Government of Grenada 2024). This will enable Grenada to defer interest payments to bondholders of USD30 million (due on 12 November 2024 and 12 May 2025).

Sovereign catastrophe bonds via multilateral development banks

Sovereign cat bonds facilitated by the World Bank peaked in 2020, with five countries having coverage of roughly USD2 billion. Three cat bonds subsequently matured from the governments of Colombia, Peru and the Philippines and were not renewed in subsequent years. Payouts amounted to USD395 million between 2017 and 2023, comprising USD210 million for earthquakes (Mexico and Peru), USD52.5 million for tropical cyclones (Philippines) and USD132.5 for pandemics (via the World Bank's Pandemic Emergency Financing Facility (PEF)). This does not include a payout of roughly USD60 million to Mexico following Hurricane Otis in 2023, given that the event's eligibility was confirmed in 2024 (discussed in Section 5.4).

Sovereign insurance (via regional risk pools)

Insurance coverage from the four regional pools steadily increased from USD891 million in 2017 to USD1.5 billion a year in 2023. CCRIF accounts for the bulk of this amount, providing country coverage in excess of USD1 billion every year since 2020. Moreover, only CCRIF's coverage has consistently increased. ARC's coverage level has also grown in recent years, but this is partly due to the increased uptake of ARC Replica, which accounted for roughly 45% of ARC's total annual coverage of USD127 million in 2022. PCRIC's and SEADRIF's annual coverage remained low and steady for most of the period. Payouts from all four risk pools totalled USD398 million between 2017 and 2023.

Pre-arranged financing by regions

Combining all the above instruments reveals that countries in Latin America and the Caribbean account for the vast majority of annual coverage, almost 80% on average between 2017 and 2023 and 36% of average annual payouts. However, despite accounting for only 14% of annual coverage over this period, East Asia and Pacific payouts account for 41% of the annual payouts. This is due to large disbursements of contingent loans from the World Bank and ADB to just two East Asian countries, Indonesia and the Philippines, in 2018 and 2021, respectively.

14 Processing of both loans was already underway prior to the covid-19 pandemic, but approval was accelerated following the outbreak and a resulting temporary amendment (later made permanent) to the contingent disaster financing (CDF) in April 2020 to include health emergencies.

Figure 2: PAF coverage, by instrument (2017–2023)

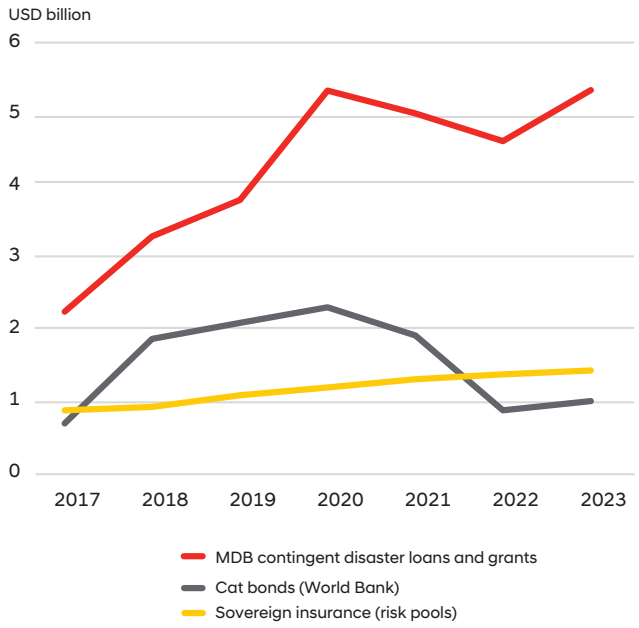
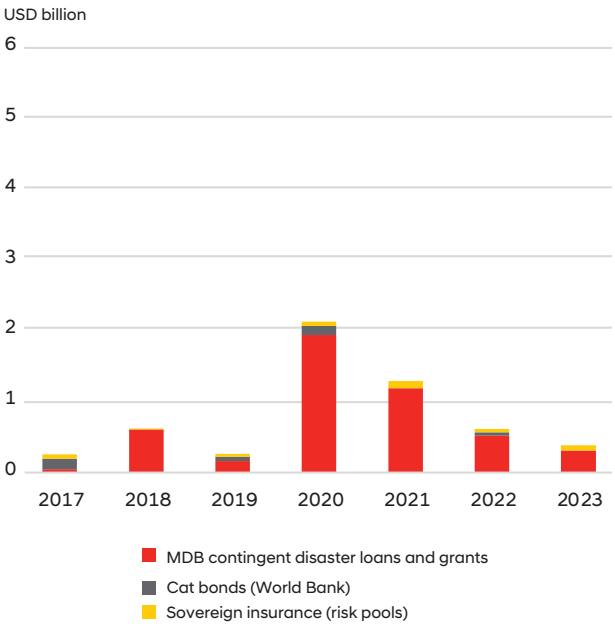


Figure 3: PAF payouts, by instrument (2017–2023)



Note: risk pool coverage and payouts are based on sovereign-level insurance policies for CCRIF, PCRIC and SEADRIF. However, ARC data includes ARC Replica data as well as the sovereign policies data.

Source: Centre for Disaster Protection, based on MDB data from online loan and grant documents; cat bond data from World Bank press releases and Artemis (2024a); and risk pool data from ARC (2023, 2024a, 2024b), CCRIF (2023a) and data received directly from CCRIF, PCRIC and SEADRIF.

Figure 4: PAF coverage, by region (2017–2023)

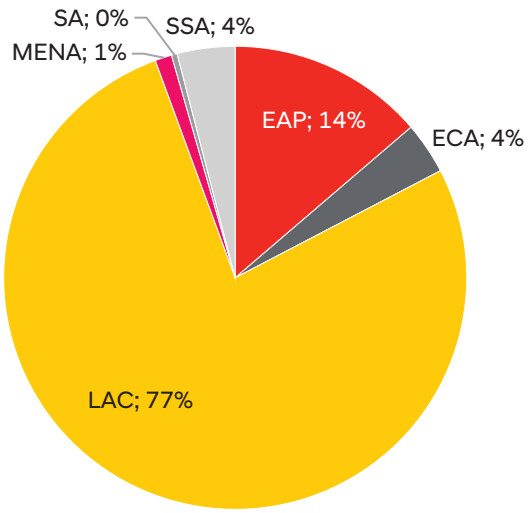
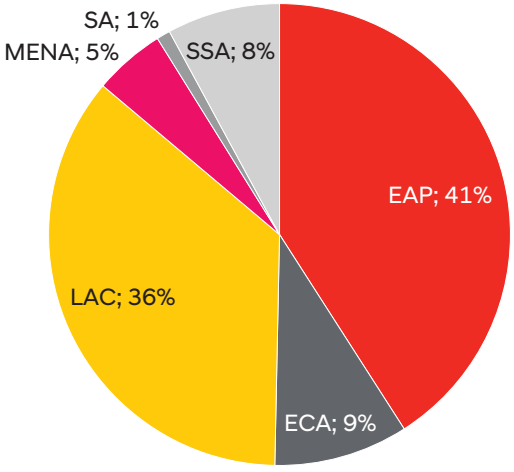


Figure 5: PAF payouts, by region (2017–2023)



ECA = Europe and Central Asia; EAP = East Asia and Pacific; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SA = South Asia; SSA = Sub-Saharan Africa.
Source: Centre for Disaster Protection, based on MDB data from online loan and grants documents; cat bond data from World Bank press releases and Artemis (2024a); and risk pool data from ARC (2023, 2024a, 2024b), CCRIF (2023a) and data received directly from CCRIF, PCRIC and SEADRIF.

4

OVERVIEW OF ASSESSMENT CRITERIA

SUMMARY

PAF instruments in this report are assessed based on seven criteria that are widely seen as essential for ensuring that PAF reduces the human and financial costs of disasters:

- attractiveness, examining country uptake and retention;
- affordability, exploring the direct cost to governments;
- financial efficiency, capturing value for money based on the full economic cost to governments relative to the expected payout as well as amount of donor support;
- timeliness, assessing how promptly financing is disbursed;
- predictability, considering whether disbursement of the financing is assured when a crisis strikes (with a particular focus on the underlying triggers);
- contribution to wider resilience building beyond financial preparedness; and
- evidence of development impact, through contributions to fiscal stability, and protection of poor and vulnerable groups.

This section defines the seven criteria used in this report to assess the strengths and weaknesses of each instrument. With the exception of 'attractiveness', the rest of the criteria align broadly with six of the seven habits of highly effective disaster risk financing identified by the Centre for Disaster Protection (Hill et al. 2021) – specifically, that disaster risk financing:

- is timely (covered by the criterion on timeliness);
- provides a trusted guarantee (covered by the criterion on predictability);
- aligns with the bigger picture (covered by the criterion on resilience building);
- focuses on poverty (covered by the criterion on evidence of development impact);
- offers good value (covered by the criteria on affordability and financing efficiency); and
- improves constantly (captured by the sub-criterion relating to evidence of resilience building and development impact).

The assessment does not include criteria related to one of the Centre's seven habits – 'the creation of power for people facing risk by supporting locally owned and led decisions and actions' (Hill et al., 2021) – given this would be difficult to assess in a high-level assessment that does not include country case studies. Furthermore, the assessment does not attempt to address all aspects of six habits in full as defined by the Centre, given the research is largely desk-based and therefore lacks the granularity needed to robustly assess each of these habits. Additional caveats are as follows.

First, each of the financing instruments is not expected to perform in an identical manner – and, indeed, they are not designed to do so. Second, some instruments are better established than others, which may impact relative performance since it provides more time for learning, refinement and generating buy-in from countries. Third, some financing instruments are better suited to certain country contexts than others, including as determined by the extent and nature of other ex-ante and ex-post financing instruments already in place, and the degree of strength and effectiveness of public financial management systems. These elements are not assessed in this report.

Commensurate with its high-level, qualitative nature, a simple traffic light scoring system is applied in relevant sections of the assessment. Specifically, the following colour coding is applied:

- green = good
- amber = fair
- red = poor
- grey = not rated due to insufficient information.

4.1. Attractiveness

PAF offers many advantages, particularly when compared with reliance on post-disaster aid, but it remains relatively under-utilised. One of the main reasons is that despite the magnitude of disaster costs, governments and individuals tend to discount low-probability future losses. Managing risks is often less of a political priority than fiscal stability, unemployment or inflation. A government's decision to pre-arrange disaster financing is therefore often a political choice, subject to conflicting budgetary pressures and other demands on government spending. In particular, instruments such as insurance that require an upfront payment can suffer from 'regret' – when the government pays the premium, but receives no payout in a good year. This can lead to the view that the insurance was a bad investment and the decision not to renew the policy in the subsequent year. Limited widespread understanding of insurance can reinforce this view.

In the absence of direct feedback from countries on whether instruments match their needs and priorities, we use three proxies of attractiveness to countries. These include one measure of uptake and two measures of retention for each instrument at the country level. Other criteria assessed in this report are also likely to influence attractiveness, and are discussed separately.

4.2. Affordability

The financial cost of instruments is a key factor that influences a government's decision to pre-arrange financing, especially in countries with tight budgetary constraints. Depending on the instrument and provider, the cost can be in the form of fees, charges, premiums, loan repayments and/or interest rates. However, a country may not have to pay the full cost, with development partners paying some or all of the costs, directly or indirectly.

The timing of these costs may also vary, with some instruments imposing a direct cost on the government before a disaster occurs. Demand can be expected to be very sensitive to the cost relative to the countries' perceived risk and expected losses, which can vary substantially (e.g. depending on their economic structure, their degree of self-insurance through reserves, and their access to emergency or other financing).

This criterion will assess the direct cost of these instruments to the beneficiary government, including the average grant element and fees of the contingent loans, and risk multiples for risk transfer instruments, as well as the availability and average size of premium subsidies for the two risk transfer instruments – sovereign cat bonds issued via the World Bank and sovereign insurance from the regional risk pools. The value for money of instruments for a government based on the full

economic cost and expected payout is assessed under the next criterion in Seection 4.3: Financial efficiency.

Grant element

MDBs provide contingent disaster finance in the form of grants and also loans, both concessional and non-concessional. The loans, even non-concessional ones, tend to be on more favourable terms than the borrower country can obtain in the market. Grants have a 100% grant element, while loans with favourable terms also have a hidden grant element. The latter can come about from a low to zero interest rate, a grace period on repayments (a period where no repayments are made), adjustments to the number of repayments made per year, and adjustments to the period the loan is repaid over (referred to as the loan's maturity). Calculating this grant element provides information on the full extent of grant funding that has been made available to a country.

However, the three MDBs do not currently publish sufficient information to allow the calculation of the grant element for actual contingent disaster loans that have been disbursed, particularly for non-concessional loans with floating interest rates. We therefore use the most recent publicly available information and best estimate assumptions when this information is incomplete to create a representative instrument for each MDB's contingent disaster loan. We then apply the Organisation for Economic Co-operation and Development Development Assistance Committee (OECD DAC) methodology, particularly the annuity formula, to estimate the difference between the loan's nominal value (face value) and the sum of the discounted future debt-service payments to be made by the borrower (present value) for the representative instrument. Further details can be found in Annex 2.

Risk multiple

The premium cost of a risk transfer instrument varies depending on the policy structure and risk profile of the coverage being bought, so it is misleading to compare premium costs without accounting for the coverage details and target risk level. The 'risk multiple' is a common metric for comparing premium prices for risk transfer.

The risk multiple metric describes the ratio of the annual premium costs to the annual expected payouts (expected risk multiple). This modelled view of risk multiples is generally one of the key determining factors in how catastrophe risk transfer is priced at the point of purchase.

Premium subsidy

Development partners can pay a portion or all of the premium for a risk transfer policy on behalf of a government. Using publicly available data we assess the share of premiums that governments have benefitted from.

Given the different pricing structure of these various instruments, no comparative metric is used for this criterion.

4.3. Financial efficiency

When comparing the financial costs of different PAF instruments, it is important to consider the full economic cost of the instrument to the government. This includes the fees associated with the instrument and the costs of repaying it, as well as the opportunity cost – that is, alternative use of the finance that must be forgone when using an instrument.

The first sub-criterion in this section focuses on the full economic cost to the country's government relative to the payout, taking into account any subsidy or discount received. The second sub-criterion examines the cost to development partners by assessing how much international public finance goes into creating every USD1 of annual average disbursement or payout from each instrument (using the OECD DAC approach to calculating the 'grant equivalent' of a loan described above, as well as premium support). The latter is important because while a heavily subsidised instrument may be cost-efficient for a country, it may not be an efficient use of scarce international public finance if less subsidised alternatives with similar costs are available.

The results of the cost multiple analysis as shown in Section 5.3 should not be interpreted as advice to governments as they are based on several simplifying assumptions about the terms and conditions of each instrument. Therefore, they may not reflect the actual terms that a specific country may be able to access

or negotiate for each instrument. They are limited to internationally supported PAF instruments and do not include instruments that tend to be domestically financed such as national disaster funds. They also evaluate instruments individually rather than evaluating strategies that combine the different instruments in different ways as was done in Clarke et al. (2017). CRDCs are not included in this analysis.

Box 3: Key terms

Opportunity cost: the cost of an alternative use of the finance that must be forgone to use a certain instrument.

Return period: an indication of the likelihood of an event occurring; a recurrence interval demonstrating how frequently an event is expected to occur.

Cost multiple: the expected net present value total cost of an instrument divided by the expected net present value disbursement.

Cost multiple to government

The opportunity cost to a government goes beyond the interest rate for a loan or the premium paid for an insurance policy. For example, some MDBs offer loans, where a country can choose between drawing down the loan immediately or using that allocation to establish a contingent loan. The latter delays the drawing down of funds which may be cheaper than alternative financing currently available to the government.

To analyse the full economic cost of different instruments to the government, the Centre collaborated with the UK Government Actuary's Department. Similar to the theoretical framework introduced in Clarke et al. (2017), this criterion provides a cost metric for each instrument. The cost multiple introduced by Haq et al. forthcoming provides a simple view of the relative costs to countries of using different instruments. They show the average cost to a country of USD1 of payouts from an instrument. The multiples depend on the likelihood of the instrument being triggered. These costs and payouts are presented in present value terms by discounting all future payments using a discount rate. More financially efficient instruments are represented by lower cost multiples.

The cost multiple can be used to evaluate costs of different risk financing instruments at different return periods. A return period of a '1-in-100-year flood' is an estimate of the likelihood of a certain level of disaster risk being exceeded over the next year. A flood with a return period of 100 years is statistically expected to recur every 100 years over an extended period of time (or has a 1% probability of occurring). An increasing return period corresponds to a decreasing event frequency. The analysis considers the cost multiple at a given return period; for example, in the case of a '1-in-5-year drought' or a '1-in-100-year earthquake', this is what the government would expect to pay per USD1 of public expenditure financed by an instrument that is triggered at that return period.

Many instruments have lower cost multiples where they can be triggered at lower return periods because their benefits only occur if they are triggered. These cost multiples depend on the likelihood of the instrument being triggered. A lower multiple represents a lower relative cost to the government of using the specific instrument. The preference for financial instruments may vary as the frequency of triggering becomes less likely (moving to higher return periods). In addition, there will also be wider considerations when making a decision on the use of a particular instrument. However, in the absence of other considerations, we would expect that of the instruments available to a government those with the lowest cost multiple would be preferred. Moreover, while the cost multiple will generally tend to increase with the return period for most instruments, this happens at different rates, meaning that some instruments may be more attractive for more frequent shocks and others more attractive for less frequent shocks.

Where relevant, the cost multiple for an instrument was adjusted to reflect the average level of subsidy or discount that a country typically receives to derive the full economic cost to the government. This was specifically done for cat bonds and sovereign insurance, whereas no adjustment was needed for MDB concessional contingent disaster loans and grants because their terms already include a grant element as standard.

To facilitate this analysis, several simplifying assumptions, general and instrument specific, were made. A key assumption was the use of a discount rate to determine the present value of future cashflows for the contingent disaster loans and grants from the MDBs. We show the results using both 5% and 10% discount rates. Further details on the methodology and assumptions can be found in Annex 3 and Haq et al. forthcoming.

4.4. Timeliness

One of the main justifications for PAF is its ability to provide rapid liquidity to crisis-affected countries and people. In the event of a disaster, financing is not immediately required in full to meet all resulting needs, such as reconstruction. However, the provision of financing as and when required is essential, most critically to address humanitarian needs, but also to limit the ultimate economic and social impacts of an event. The assessment has therefore considered the speed and timeliness of decisions about payouts and disbursements to governments, exploring whether each instrument can provide confirmation of financing sufficiently promptly for each stage of funding need.

Ideally, we would have based the assessment on the average number of days between an event occurring or a country's request and the date of the first payout or disbursement, but this was not possible given the availability of data. Consequently, the time between the country's request to exercise an instrument after an event and the providers' decision regarding the eligibility of the event was used for each of the sub-criteria below, with the exception of early action.

The scoring is defined as follows:

i. **Early action**: actions that take place before a hazardous event occurs predicated on a forecast or credible risk analysis of how the event will unfold. For example, these could include actions to plant more drought-resistant crop varieties based on poor seasonal rain forecasts, or to evacuate people and livestock, protect properties and rapidly harvest crops in response to a tropical cyclone warning. Some actors have a wider definition of early action that includes activities that take place after a hazardous event, but before the disaster reaches its peak (REAP 2022). For this paper, however, we use the narrower definition focused on financing actions before an event occurs, while the wider definition relating to taking actions after the event but before acute impacts are felt fall under 'Response' below. The assessment assumes that early action is 'good' if the instrument uses forecasts or risk analysis to provide financing before an event occurs and has done this in the majority of cases; 'fair' if the instrument uses forecasts or risk analysis to provide financing before the event occurs and has disbursed financing before eligible events in some cases; and 'poor' if the instrument does not use forecasts or risk analysis to provide financing before the event occurs. This is not rated if there is insufficient information.

ii. **Response**: 'actions taken directly before, during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected… [It] is sometimes called disaster relief' (UNDRR 2024). The assessment assumes that for response purposes, a payout decision within 14 days of a country request is 'good', within 15 days to two months 'fair'; and beyond two months 'poor'. This is not rated if there is insufficient information.

iii. **Early recovery**: a multidimensional process of recovery that begins in a humanitarian setting and is guided by development principles, encompassing the restoration of basic services, livelihoods, shelter, governance, security and rule of law, environment, and social dimensions, including the reintegration of displaced populations (UNDP 2008). For early recovery purposes, a payout decision within one month of a country's request is 'good', within 1–3 months 'fair', and beyond three months 'poor'. This is not rated if there is insufficient information.

iv. **Reconstruction**: 'The medium- and long-term rebuilding and sustainable restoration of resilient critical infrastructures, services, housing, facilities and livelihoods required for the full functioning of a community or a society affected by a disaster, aligning with the principles of sustainable development and 'build back better', to avoid or reduce future disaster risk' (UNDRR 2024). For reconstruction purposes, a payout decision within six months of a country request is 'good', within 12

months ‘fair’ and beyond 12 months ‘poor’. This is not rated if there is insufficient information.

Actual financing requirements for each of these purposes – and the relative balance of financing needs – differs according to the type and intensity of the hazard event and country context, including demographic, social, economic and environmental factors. However, reconstruction costs typically account for by far the largest share of total financing requirements due to the costs entailed in restoring infrastructure. Droughts present a notable exception as they typically cause limited damage to physical infrastructure and, if adequate early warnings are in place, present early action opportunities to minimise damage (e.g. via alternative cropping decisions) and, thus, associated economic and social hardships.

A second element of timeliness relates to the speed of utilisation of funds; that is, how quickly governments use the financing received to fund expenditures. This may entail, for example, cash transfers to affected households, or the repair or reconstruction of damaged public infrastructure. This is an important element of timeliness since delays in the use of funds can undermine the benefits of PAF. In fact, absorption capacity is an issue even in normal circumstances with many governments struggling where it matters most for efficient and timely responses on budget execution (PEFA 2022). This is partly due to weaknesses in public financial management systems in the areas of budget prioritisation, internal controls, and procurement and disbursement procedures, which become further strained during crises. The covid-19 pandemic revealed that the public financial management systems of several countries were not sufficiently robust to ensure flexible, efficient and transparent responses to crises; as a result, various modifications had to be made (PEFA 2022).

Speed of utilisation is rated as follows:

- ‘Good’ (green) if there are explicit time frames for when funds are utilised by the government and these time frames are met based on transparent criteria.
- ‘Fair’ (amber) if there is a time frame but there is usually a 1–3 month delay.
- ‘Poor’ (red) if the delay is more than three months.
- ‘Not rated’ (grey) if there is no explicit time frame or insufficient information.

4.5. Predictability

PAF provides an opportunity to improve countries’ readiness in advance by preparing response plans or by strengthening government systems and processes to effectively respond to disasters before they occur. However, this does not happen automatically. For PAF to produce the desired behavioural changes, the expected implementers and targeted beneficiaries of the funding must be confident that the money will arrive within the expected time frame when there is a crisis. Without a reasonable degree of predictability, the various actors along the results chain for realising the intended outcomes will have little incentive to undertake preparedness measures ahead of events. Predictability is particularly important for countries with weak public financial management systems and those that struggle to create and maintain contingency reserves.

This criterion does not directly assess government’s perceptions of the reliability of PAF instruments but instead assesses two key factors that are likely to influence how governments perceive the predictability of PAF. These include:

i. Unmet expectations of payout or disbursement due to basis risk, which may result either from the difference between an index and the shock that that index is supposed to be a proxy for, leading to either an overpayment or shortfall in payout (Centre for Disaster Protection 2024), or from instances of non-payouts, where the catastrophe models and triggers worked properly, but the country still anticipated a payout due to a different understanding of the trigger and instrument.

ii. Excessive conditions for the release of funds after the trigger is met, which may impede the payout or disbursement.

No explicit rating is given for this criterion given the challenges in assessing trigger quality using publicly available information (as described in Box 4), as well as the lack of external clarity on the occurrence of basis risk events.

Box 4: Challenges in externally assessing trigger quality

PAF instruments are typically designed to respond to a specific type and severity of event. The trigger design process requires the parties to the transaction to make choices that reflect the preferences of the risk holder and the provider, and are balanced against technical feasibility and cost considerations.

The preferences of governments and providers, and the rationale for certain trigger design choices are unobservable to external observers – it is therefore not possible to make robust external assessments of the suitability of triggers, as external perceptions of what events should be eligible may be substantially different from the perspectives of parties to the transaction. This makes it challenging to determine externally whether a basis risk event has occurred. Similarly, neither the technical analysis which support trigger design nor the actual details of final trigger structures are available publicly for most instruments – this lack of public information, and the unobservability of risk holder preferences or perspectives on instruments' coverage, make external assessments of trigger quality challenging.

4.6. Evidence of resilience building

All the instruments in this report are designed to strengthen governments' financial management of disaster risk and build their fiscal resilience through quick access to financial resources in the event of a disaster. This criterion on resilience building, however, does not assess instruments' contribution to the development of effective strategies for the financial management of disaster risk. Financial resilience is the main thrust of the assessment and covered from various angles under other assessment criteria; in particular, timeliness, predictability and development impact.

Resilience building, however, is a broader, multi-dimensional concept. According to the Sendai Framework on Disaster Risk Reduction, it spans a range of activities that seek to enhance the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner (UNDRR, 2024). In the field of disaster risk and risk management, resilience building is often broken down into four activities:

- Risk reduction through activities and measures to reduce existing disaster risks and avoid creating new ones; for example, by introducing and applying risk-sensitive building standards and land use plans, and investing in flood risk management programmes.
- Preparedness through building the knowledge and capacities of governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to and recover from the impacts of disasters; for example, by installing early warning systems, identifying evacuation routes and preparing emergency supplies.
- Building back better by reconstructing physical infrastructure after a disaster to higher standards of resilience that are better able to withstand future shocks.
- Improving understanding of risk and knowledge of hazards and vulnerabilities to better inform government, private sector and individual investment decisions, plans and policies.

PAF instruments can potentially play a role in building broader physical, social and economic resilience by driving the transition to a more proactive approach to risk management. They can be designed to directly support or indirectly incentivise resilience via a wide range of measures, including eligibility requirements and provision of complementary technical assistance.

For some actors, the contribution of DRF instruments in this regard is paramount in view of the significant imbalance of focus and resources on activities after the occurrence of an event relative to risk reduction, with far more spent ex post (ADB 2023a; Plichta and Poole 2024). PAF providers may also be motivated to contribute to enhanced resilience as their own

performance will become increasingly ineffective if levels of risk continue to rise.

This criterion assesses the contribution of PAF instruments to the four activities associated with enhancing resilience based on publicly available information such as annual progress reports and independent evaluations.

Each sub-criterion for each of the four resilience-building areas is rated as follows:

- 'Good' (green) if there is strong evidence of the instrument building resilience (beyond fiscal resilience) based on publicly available information.
- 'Fair' (amber) if there is some evidence of the instrument building resilience (beyond fiscal resilience) based on publicly available information.
- 'Poor' (red) if the instrument is not designed to contribute to the area and there is no evidence that it builds resilience.
- 'Not rated' (grey) if there is insufficient information.

4.7. Evidence of development impact

Most sovereign-level PAF instruments are designed to contribute to one of two end goals or both: fiscal stability and/or protecting poor and vulnerable groups. Using publicly available information, particularly independent evaluations where available, this criterion explores the extent to which each instrument contributes to these end goals, irrespective of the stated ambitions of the instrument.

Ensuring fiscal stability during disaster situations

Depending on the country, disasters can significantly destabilise fiscal policy by depressing economic activity and revenues, while increasing expenditure on response. This can overwhelm the government's fiscal capacity to respond, resulting in: (i) a reliance on disaster appeals and assistance, which is often not only unpredictable but also untimely; and (ii) undermining fiscal plans and intensifying macro-fiscal stress. Governments are therefore increasingly keen to explore instruments that enhance their financial preparedness and capacity to respond, thereby mitigating the immediate adverse economic impacts of disasters.

Protecting poor and vulnerable groups

Disasters disproportionately adversely affect poor and vulnerable groups, resulting in deeper poverty, which in turn leads to greater vulnerability to future shocks and thus a further downward spiralling. Both insufficient and delayed post-disaster support contributes to this downward spiral. Linking PAF to systems and plans to ensure that interventions reach specific vulnerable groups in a timely manner once triggered is therefore seen as one of the most effective ways of protecting those in society who are least able to withstand shocks.

Each of these two end goals is rated separately in the following manner:

- 'Good' (green) if there is strong evidence of the instrument's development impact.
- 'Fair' (amber) if there is some evidence of the instrument's development impact.
- 'Poor' (red) if the instrument is not designed to contribute to this sub-criterion and there is no evidence of development impact.
- 'Not rated' (grey) if there is insufficient information.

5

FINDINGS FROM ASSESSMENT OF INSTRUMENTS

This section analyses the performance of each instrument based on the seven assessment criteria outlined in Section 4, using publicly available data and interviews with representatives of the MDBs and regional risk pools.

5.1. Attractiveness

SUMMARY

Country uptake and retention vary significantly across PAF instruments and providers, with measures of uptake and retention being disappointing in several cases (Figure 6). The two exceptions are contingent disaster loans from IDB's CCF and sovereign insurance from CCRIF, which are the most popular in their respective categories. As a percentage of the total countries eligible, 79% and 62% have used CCRIF and CCF instruments, respectively, with almost all countries renewing the respective instruments or, in the case of the IDB CCF, extending loans for an additional five years.

In contrast, uptake of contingent disaster grants and loans from the World Bank (particularly among IBRD countries) and ADB (particularly outside of the Pacific) has historically been low. Half of IBRD countries with Cat DDOs prior to 2021 did not have a Cat DDO between 2021 and 2023, which in part may be due to a preference for cash in hand and available country envelopes, while ADB's first CDF loans beyond the Pacific were not approved until 2020.

Six countries have sponsored sovereign cat bonds issued with World Bank support; three of these countries have renewed their expired cat bonds, the other three have not.

Despite being relatively new instruments in the MDBs' toolkit, countries' uptake of CRDCs (six countries for IDB and seven countries for World Bank) has been slowly building.

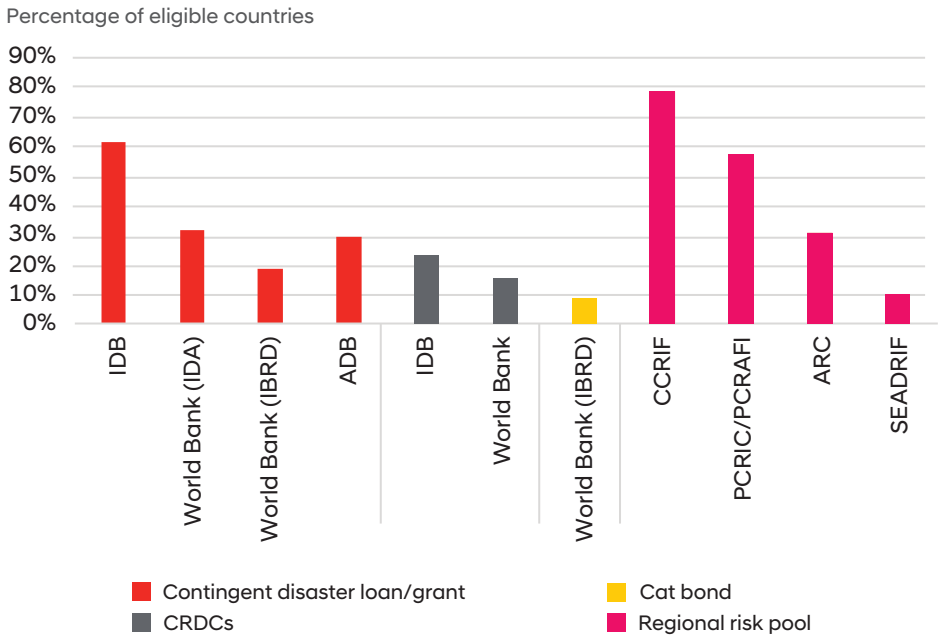
Both the ARC and PCRIC risk pools have struggled to gain traction and attract loyal customers. Prior to the increase in premium support in 2020 and 2023, respectively, ARC and PCRIC experienced several years of stagnation, with several countries choosing not to renew their coverage and very few new entrants. SEADRIF, the newest of the four risk pools, has yet to provide coverage to additional countries beyond its first country in 2021.

Three indicators are calculated in this section to assess the uptake and retention of each instrument.

i. **Uptake**: the first indicator measures the number of countries that have used the instrument at least once since its inception as a percentage of the total eligible countries. The results are shown in Figure 6.

ii. **Retention**: effective use of PAF requires continued coverage over the long term but, in practice, this has not always occurred for various reasons, which are explored in this report. The second indicator measures the percentage of countries that secured coverage from the instrument during at least one year before 2021 but have not taken out coverage during any of 2021-23 (Figure 7). The third indicator measures the extent to which countries have remained covered by an instrument since their first year of coverage. It captures the extent of movement in a summary aggregate number; the number of years each participating country has secured cover from a particular instrument is calculated as a percentage of the total number of years since that country's first year of coverage by that instrument.[15] The results are shown in Figure 8.

Figure 6: Country uptake of PAF instruments between inception and 2023

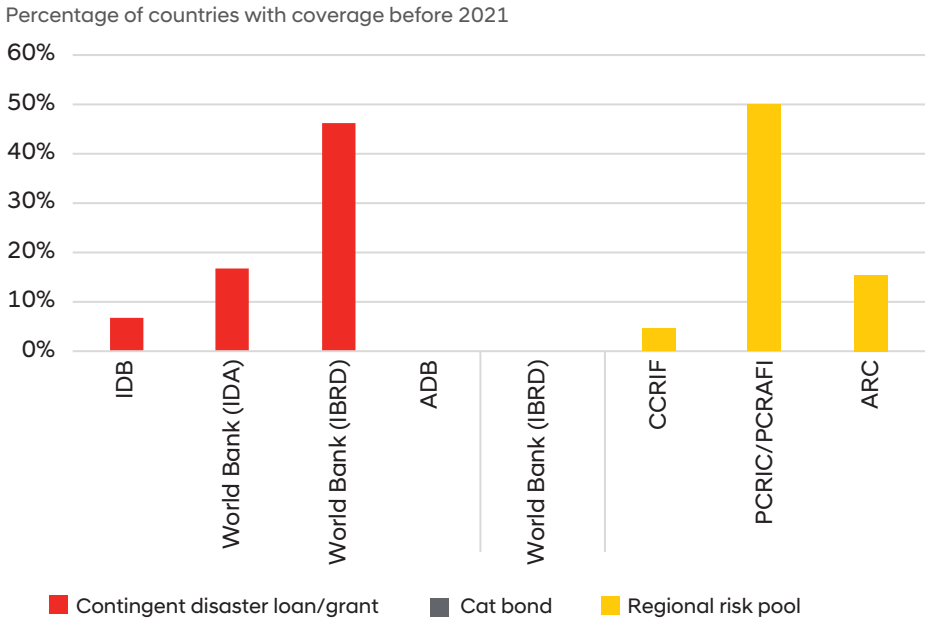


Note: CCRIF country-level data is available up to 2022.

Source: Centre for Disaster Protection.

15 For instance, if a country purchased an insurance policy every year between the pool's first year of operation and 2022 – that is, for a full 15 years – it would score 15/15 or 100%. Had it dropped coverage one year, it would have scored 14/15 or 93%, and so forth. This calculation was undertaken for each country that had purchased a policy from the risk pool since inception and then averaged the results to provide a pool aggregate figure.

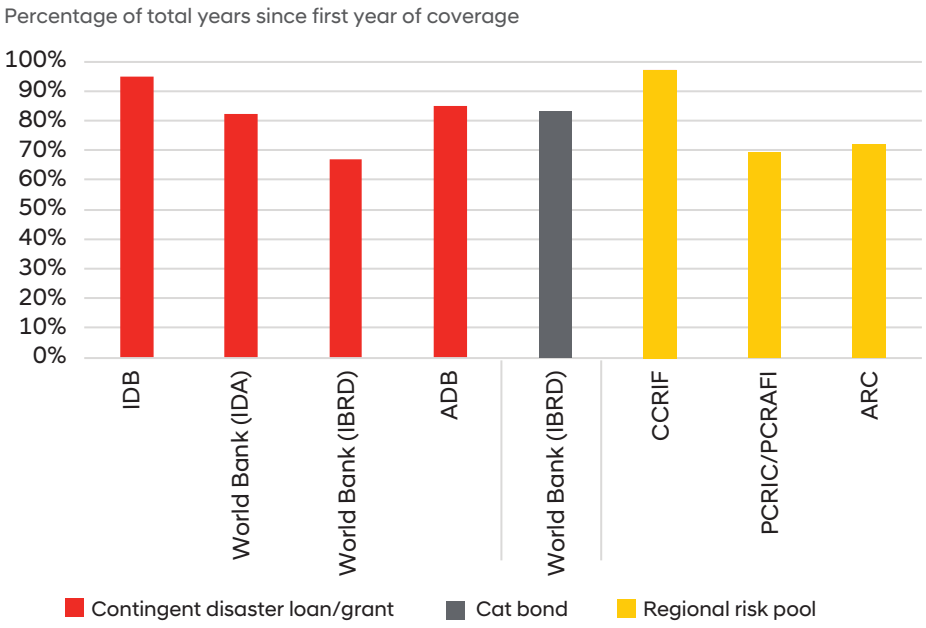
Figure 7: Proportion of countries covered before 2021 but not covered over the period 2021–23



Note: excluding countries that took out cover for the first time in 2023. The CCRIF indicator is based on data for 2020–22 because country-level data is only available up to 2022. SEADRIF is not shown as it covered only one country. The indicator is not applicable for CRDCs.

Source: Centre for Disaster Protection.

Figure 8: Average number of years countries have secured cover as % of total years since their first year of coverage



Note: excluding countries that took out cover for the first time in 2023. The CCRIF indicator is based on data for 2020–22 because country-level data is only available up to 2022. SEADRIF is not shown as it covered only one country.

Source: Centre for Disaster Protection.

Contingent disaster loans and grants

Originally conceived as a pilot programme between 2006 and 2012, IDB's CCF has become increasingly popular since 2019. On average, 16 countries have secured coverage via the CCF for 95% of the period since the first year of coverage, with only one previously covered country (Guyana, which obtained and disbursed a CCF loan during the covid-19 pandemic) failing to secure coverage in any of the years between 2021 and 2023. The number of countries with a CCF loan doubled between 2018 and 2023, with a total of 16 countries – or 62% of eligible countries – having had a CCF at some point. The initial slow uptake of the IDB CCF may have been partly because the earliest CCFs were not triggered due to an 'absence of recent major emergencies' and also because, according to some client countries, the triggers and conditions were 'too rigid and difficult to achieve' (IDB OVE 2014). However, there has been a significant increase in uptake of the CCF since amendments were introduced in 2019, including changes to the commitment fees, an option for replenishment of funds after drawdown(s), and the introduction of a second, soft trigger modality (Modality II). Moreover, client countries have typically continued to maintain CCF programmes, extending them for an additional five-year period.

The overall uptake of Cat DDOs by World Bank clients has been relatively low. On average, 15 IDA[16] and 13 IBRD countries have secured coverage via a Cat DDO for 82% and 67%, respectively, of the period since the first year of coverage, with two IDA and six IBRD countries that were covered in earlier years failing to secure coverage in any of the years between 2021 and 2023. Between 2008 and 2023, the Bank approved DPF Cat DDOs for 33 countries: 13 IBRD countries, 19 IDA countries and one blend[17] country. This is equivalent to 32%, 19% and 6%, respectively, of all IDA, IBRD and blend countries. Annual approvals of World Bank Cat DDOs have fluctuated significantly between years, not least as processing of new Cat DDOs was largely put on hold in 2020 to focus on processing the instruments that were best suited to provide new financing for the covid-19 response, then rebounded in 2021 to a record high. Approvals fell slightly in 2022, but rose in 2023, suggesting perhaps a general upward trend. A key factor potentially limiting uptake has been governments' preference to use available country envelopes for more immediate investment purposes, particularly for IBRD countries with headroom issues.

ADB's CDF has yet to gain significant traction beyond the Pacific where it has proved extremely popular (covering roughly 70% of Pacific countries). ADB's CDF was only formally introduced in 2019 and 29% of ADB member countries have taken up CDF of USD1.2 billion to date. On average, 12 ADB countries have secured coverage via CDF for 85% of period since the first year of coverage, with all countries covered in earlier years securing coverage in all of the years between 2021 and 2023. ADB approved Phase 5 of its CDF programme in the Pacific, known as the Pacific Disaster Resilience Program, in June 2024. The first phase of this programme was approved in 2017 and successive programmes have covered a number of Pacific countries, including a combination of new and old entrants. To date, 10 Pacific countries have taken up CDF, with Tonga and the Cook Islands currently on their fourth CDF grants or loans. Beyond the Pacific, ADB has provided two USD500 million CDF loans to Indonesia and the Philippines. ADB has a few additional CDF operations in the pipeline for non-Pacific countries and significant scope to do more as the overall volume to date is well below ADB's current bank-wide cap on the regular CDF financed using ordinary capital resources (OCR) ADB-wide ceiling of USD3 billion and its concessional assistance-funded (concessional OCR lending and Asian Development Fund) CDF ceiling of USD1 billion (ADB 2022).

Climate resilient debt clauses (in MDB loans)

Bearing in mind CDRCs are relatively new instruments, uptake has been slowly building. As of June 2024, six countries[18] had activated CDRCs in their IDB loans totalling USD1.6 billion. While all IDB borrower member countries are eligible, the requirement that countries must have an active CCF means only 15 countries currently meet this requirement. Seven[19] of the 45 eligible small states and small island economies have requested these clauses from the World Bank (based on publicly available information as of September 2024) following the removal of the 0.05% transaction fee in 2024. Two

16 This measure excludes four countries that received their first IDA Cat DDO approval in 2023.
17 Blend countries are IDA-eligible based on per capita income levels and are also creditworthy for some IBRD borrowing.
18 These include the Bahamas, Barbados, Belize, Ecuador, El Salvador and Honduras.
19 These include Belize, Bhutan, Fiji, Grenada, Montenegro, St Lucia, and St Vincent and the Grenadines.

key factors are potentially slowing uptake: first, that MDB CRDCs are currently limited to a narrow set of hazards, which may not be relevant to some countries; second, some governments are concerned about the increase in the post-deferral debt burden.

No information is currently publicly available on the potential debt service relief that may be generated in each of these countries from using these clauses to defer debt service payments. This is partly because the size of a deferral will depend on the amount of the loan that is disbursed and outstanding at the time of the deferral request.

Catastrophe bonds (via MDBs)

Cat bonds intermediated via the MDBs are a relatively niche instrument in the MDB toolkit, with six governments sponsoring 34 cat bonds totalling USD4.16 billion via the World Bank since 2006. On average, these six IBRD countries have secured cat bond coverage for 83% of the period since the first year of coverage for tropical cyclone or earthquake. Although all countries covered in earlier years appear to have secured coverage in any of the years between 2021 and 2023 (as shown in Figure 7), cat bond coverage for Colombia and Peru expired in February 2021 and has not been renewed.

All sponsors are either high-income or upper-middle-income countries; five of the six countries are in the Latin America and the Caribbean region, and tend to have sophisticated DRF strategies or DRM capabilities. In addition to these sovereign-level cat bonds, the World Bank issued a Caribbean-wide tropical cyclone and earthquake cat bond sponsored by CCRIF in 2014, and subsequently two cat bonds to fund the insurance window of the global Pandemic Emergency Financing Facility (PEF) for IDA countries in 2017 (see Box 11). The Government of Jamaica is the only small island developing state to have independently sponsored a World Bank-issued cat bond; first in 2021 and then in 2024 to complement its other DRF instruments, which include insurance coverage from CCRIF and contingent loans from the IDB.

Out of these six sponsoring countries, three governments have renewed their cat bond coverage: Chile, Jamaica and Mexico. Mexico is the most prolific, accounting for 22 issuances since 2006. Mexico has therefore had near continuous cat bond coverage since 2006 as part of its long-established DRF programme, which dates back to the late 1990s. Anecdotally, the Government of Mexico originally became interested in cat bonds as a mechanism for securing multi-year government budget commitment to sovereign risk transfer, thus avoiding the need to defend annual budget requests for disaster insurance purposes. The Government of Philippines is one of three countries that have not returned to the cat bond market since their first issuance in 2019 (which expired in 2022), switching attention instead to indemnity insurance for national government assets with some of the cat bond payout being used to pay the premium for a pilot government asset insurance (Artemis 2024f).

No country (as of June 2024) has sponsored a cat bond issued via IDB since the IDB Board approved these risk transfer transactions in 2020.

Sovereign insurance (via regional risk pools)

Out of the four risk pools, CCRIF has performed particularly well in growing its membership and building up a loyal client base in the Caribbean and, more recently, Central America. On average, 22 countries have secured CCRIF coverage for 97% of the period since the first year of coverage, with only one country failing to renew its policy in all of the years between 2020 and 2022. The number of CCRIF member governments purchasing coverage increased from 16 countries to 23 between 2007 and 2022, meaning that 79% of eligible countries have been covered by CCRIF. Members have purchased coverage worth over USD1 billion annually since 2020 compared with USD494 million in the first year of operation. And while expansion into Central America was initially slow, with Nicaragua being the only participating country between 2015 and 2017, three additional countries have since joined: Panama in 2018, Guatemala in 2019 and Honduras in 2023.

ARC is the second-largest risk pool in terms of number of countries and aggregate coverage. A total of 17 countries have purchased insurance from ARC since the initial four countries in 2014, providing more than USD100 million in annual coverage for most years since 2019. On average, these 17 countries have secured ARC coverage for 79% of the period since their first year, with two countries not renewing their policies in any of the years between 2021 and 2023. Following a steady decline in participating countries from seven to three between 2015 and 2019, there was a noticeable increase in uptake

between 2020 and 2023, with eight new entrants due to increased support to cover insurance premiums (discussed in Section 5.2), bringing the total number of participating countries to 10 in 2023. However, several of these countries do not consistently renew their policies. Countries that were once described as 'loyal buyers' (Martinez-Diaz et al. 2019) have gaps in their recent coverage since 2019; for example, Senegal. Burkina Faso, another 'loyal buyer', has completely dropped out since 2020 due to ongoing political instability, though it has been benefitting from ARC Replica since 2019. Kenya has also dropped coverage since 2017, largely due to unmet payout expectations (Martinez-Diaz et al. 2019).

PCRIC has been slow to grow, missing the World Bank target of five additional countries purchasing PCRIC insurance in 2022 from a baseline of three in 2021 (World Bank 2023c). Of the 14 countries eligible to purchase PCRIC policies, eight have secured PCRIC coverage for 72% of the period since the first year of coverage over the combined 11 years of operation of the PCRAFI pilot and the subsequent PCRIC programme, with three not renewing their policies in any of the years between 2021 and 2023. Looking at the PCRIC period alone (2017–2023), seven countries have purchased coverage at least once. They include three loyal buyers (Cook Islands, Samoa and Tonga), which have maintained coverage throughout this period, whereas the Marshall Islands and Vanuatu have not renewed their coverage over the past five years. The Solomon Islands is the other country that was originally part of the PCRAFI pilot, but which dropped out after not receiving payouts when a major disaster struck during the pilot phase (World Bank n.d.). This relates to the issue of basis risk, which is discussed in further detail in Section 5.5. Moreover, the business case and attractiveness of PCRIC has also been weakened by changes to MDB contingent disaster loans and grants; for example, the launch of IDA Cat DDOs in 2017 and ADB's CDF, after PCRIC's creation (World Bank 2023c).

Fiji and Niue purchased PCRIC coverage for the first time in 2023 following the development of relatively new 'cat-in-the-box' models that are easier to understand than PCRIC's older modelled loss models.

Each of these three risk pools has further enhanced its attractiveness by expanding its product offering. CCRIF has expanded from two to six products, from tropical cyclone and earthquake in 2007 to today where it offers four additional products, for excess rainfall, and for the fisheries and electric and water utilities sectors. ARC's portfolio has also grown, with additional products (rangeland drought, tropical cyclone, and outbreaks and epidemics), and insurance for floods under development. Going beyond its original tropical cyclone and earthquake/tsunami insurance products, PCRIC has also branched out to issue a sovereign excess rainfall product and a coral reef policy for a civil society organisation in Fiji, and an earthquake policy covering damage to a submarine fibre optic cable network for a state-owned enterprise in Papua New Guinea (PCRIC 2024b); it is also in the process of developing a product for drought.

SEADRIF, the newest of the four risk pools, is at the beginning of its journey, with just one policy in place, for Lao PDR, and one payout. This policy was issued to Lao PDR for a three-year period in 2021 and renewed in 2024 for a shorter period of six months. Uptake of its low-income country product targeting Cambodia, Lao PDR and Myanmar, primarily covering floods, has therefore been limited.

Several factors have made it harder for SEADRIF to gain traction among its 10 eligible countries. First, SEADRIF operates in a diverse region, spanning lower-middle-income through to high-income countries and some of the most hazard-prone countries in the world through to countries facing very limited extreme weather and geophysical hazards. There are also some notable differences in the principal hazards countries face and the pre-existence of state-owned (re)insurance companies in several countries already offering natural hazard cover. These include Maipark in Indonesia, a state-owned reinsurer concentrating on earthquake risk; the Government Service Insurance System in the Philippines, which provides indemnity natural hazard coverage to national and local governments and is currently establishing a parametric natural hazard product with support from ADB; and Vietnam's well-developed national insurance and reinsurance market. A number of countries eligible for SEADRIF policies have also subsidised agricultural insurance programmes involving state-backed insurance companies, a further contrast to the countries eligible for ARC, CCRIF and PCRIC products. Recognising these existing mechanisms, SEADRIF is exploring offering potential downstream advisory services that build government capabilities for public asset management rather than directly providing insurance coverage.

5.2. Affordability

SUMMARY

The cost of PAF solutions and a government's inability or unwillingness to pay are widely recognised barriers to uptake and retention. The providers of all the instruments covered in this report are taking steps to address this barrier, particularly for lower-income and climate-vulnerable countries, in the following ways:

- The World Bank and ADB provide contingent disaster grants and highly concessional loans to a subset of countries based on country-specific considerations such as income level and risk of debt distress.
- The World Bank and IDB have reduced the fees that governments have to pay for CRDCs.
- Regional risk pools are working with development partners, including MDBs, to provide member countries with more premium subsidies.
- The World Bank's Capital at Risk Notes programme was designed to help reduce the high fixed transaction costs associated with sovereign issuances of cat bonds.

The most heavily subsidised instruments are MDBs' contingent disaster grants, the World Bank's IDA Cat DDO loans and sovereign insurance from the regional risk pools, particularly ARC and PCRIC. Using a 5% discount rate and several simplifying assumptions, the IDA Cat DDO loan has a grant element of 49%. In the case of premium subsidies for risk pool members, on average, development partners covered 60% of the ARC country premium and 55% of the PCRIC country premium in the most recent year. However, in practice, levels of concessionality for MDB loans and risk pool policies vary across countries and time. Limited information is publicly available to track this.

Moreover, while premium support is available for risk transfer instruments, the amount tends to be smaller, less easily accessible and less predictable compared with grants and concessional loans from MDBs. Recognising this lack of a level playing field, recent initiatives such as the AfDB's Africa Disaster Risks Financing (ADRiFi) programme and the Global Shield against Climate Risk are seeking to provide countries with more and better access to financial support for PAF solutions.

Contingent disaster loans and grants

The cooperative nature of MDBs mean they do not engage in risk-based price differentiation for their contingent disaster financing instruments. Instead, they leverage their shareholders' capital contributions and superior financial strength as reflected in AAA credit ratings[20] to provide uniform pricing to their borrower member countries, differentiating between countries that can access grants (which has a 100% grant element) and highly concessional loans vs countries that can only access non-concessional or market-based loans. All three MDBs have transparent policies and frameworks guiding this allocation of grants and concessional finance across members. This is usually based on a country's per capita income; its degree of vulnerability and fragility; its risk of debt distress;[21] and its level of non-concessional external debt.

However, insufficient data is publicly available to estimate the grant element of the MDBs' contingent disaster loans that have actually been disbursed. The

20 The financial models of MDBs require relatively small amounts of shareholder capital from taxpayers to finance their operations. To safeguard share capital and maintain strong continuous access to capital markets, MDBs have traditionally managed their finances with the main purpose of obtaining an AAA rating from the three main credit rating agencies.

21 Using the joint World Bank-International Monetary Fund Debt Sustainability Framework for Low-Income Countries.

Table 5: Calculating the grant element of MDBs' contingent disaster loans (at a 5% discount rate)

Instrument	Assumptions			Grant element (%)
	Interest rate (%)[22]	Grace period (years)	Maturity (years)	
IDA Cat DDO	1.5	10	40	49
IBRD Cat DDO	6	7	20	0
ADB CDF	5.25	3	15	0
IDB CCF	5.55	5.5	25	0

Source: Centre for Disaster Protection based on data collected from product documents and product notes, including ADB (2024), IDB (2024c) and World Bank (2024f)

terms available to countries on different instruments, particularly non-concessional loans, vary through time with market conditions[23] and due to policy changes by institutions. Furthermore, even within instruments the terms offered to countries are differentiated. We have therefore created representative terms for each instrument by reviewing the historical use of these instruments and published term sheets (see Annex 3 for further details). The terms we use reflect what we would broadly expect these instruments to currently cost, summarised in Table 5. Notably, the interest rates for these non-concessional loans are usually linked to interest rates at the time of the loan payments. We therefore use a recent 20-year US treasury yield of 4.35%, to reflect likely long-term interest rates, with a spread for each non-concessional instrument.

Based on the selected representative terms, an IDA Cat DDO loan has a grant element of 49% at a 5% discount rate. This is to be expected given that whenever the interest rate charged for a loan is lower than the discount rate, the resulting present value of the debt is smaller than its face value, with the difference reflecting the grant element of the loan. In contrast, for the non-concessional loans from the World Bank, ADB and IDB, the interest rate plus spread exceeds the discount rate of 5%, and thus all have a grant element of 0% based on these assumptions. The publicly available information is insufficient to calculate the actual grant element of contingent disaster loans, as already noted.

However, the financial terms and conditions of these non-concessional loans may be more attractive than those under which many governments could borrow in international and domestic capital markets. Among the three MDBs, only IDB publishes an ex-ante evaluation of the financial terms of all its approved contingent disaster loans, as well as an ex-post evaluation of the loans that have been disbursed (IDB 2023a; 2023b; 2023d). Based purely on the direct cost of the instrument to the borrower countries, these evaluations show that the IDB contingent disaster loans are cheaper than alternative commercial funding, particularly sovereign bond issuances available to IDB countries (IDB 2018, 2019, 2021, 2023b and 2024b).

Furthermore, the fee structure of these contingent instruments differs from the MDBs' regular lending instruments to incentivise uptake (and are not captured in grant element calculations). Previous experience – for example, from the now expired IDB contingent credit line for 'natural disasters'[24] – highlighted that countries are reluctant to pay a stand-by fee for instruments for which disbursements depend on the occurrence of eligible events beyond their control (IDB 2020).

22 Includes spread.

23 For example, the lending rate for the International Bank for Reconstruction and Development (IBRD) Cat DDO is reset semi-annually on each interest payment date and applies to interest periods beginning on those dates.

24 The Inter-American Development Bank (IDB) created the contingent credit line (CCL) in 2012 to cover a wider range of disaster events than the Contingent Credit Facility (CCF). Unlike the CCF, any disaster resulting in the declaration of a state of emergency could lead to disbursement of a CCL, assuming other disbursement conditions (e.g. a positive macroeconomic assessment) were met. The CCL was never used and expired in 2016.

Box 5: Countries' use of contingent disaster loans and grants to boost access to multilateral development bank concessional financing

World Bank Crisis Response Window

The Crisis Response Window was introduced in 2010 to provide additional IDA resources to IDA-eligible countries in response to major disasters triggered by natural hazards, public health emergencies and severe economic crises. Under the 20th replenishment of the IDA (IDA20), the CRW can be drawn on to finance 25% of a Cat DDO grant/loan. The remaining 50% is provided from general IDA resources and just 25% from country allocations. In other words, an IDA country can use its Cat DDO to access more grants and concessional financing from the World Bank on an 'allocate USD1, get USD4' offering.

ADB's Expanded Disaster and Pandemic Disaster Response Facility

DRF+ was designed to provide eligible countries with a timely and predictable financing source to cover the costs of disaster and emergency assistance, early recovery, and reconstruction after a disaster. Although not designed to provide financing for contingent disaster purposes, ADB has allowed eligible countries on a case-by-case basis to access the DRF+ to replace disbursed contingent disaster grants, in most cases financing the further contingent disaster grants in full from the DRF+. Use of the DRF+ for this purpose has been permitted in recognition of the deterrence that the DRF+ would otherwise pose to the uptake of CDF by only allowing access to additional grant financing after a disaster has occurred.

There is therefore no stand-by or front-end fee for IDB's CCF loans and some of the contingent loans from the World Bank and ADB. Importantly, IDB's contingent loans are uncommitted (as described in Section 2) which explains the absence of this fee for its entire CCF portfolio. Instead, IDB charges a disbursement commission of 50 basis points upon disbursement, applicable only to the amount disbursed from resources of the regular loan programme. In contrast, for the contingent loans completely financed from a country's lending envelope, the World Bank, and if requested by a government, ADB[25] commit capital upon loan effectiveness to ensure that the amount will be available for disbursement immediately after a disaster occurs.

Depending on the country, the World Bank and ADB also provide contingent financing in the form of grants, whereas the CCF is always in the form of a loan. The World Bank and ADB have further enhanced the attractiveness of their contingent loans for their lowest-income members by enabling eligible countries to partly finance these loans with grant and concessional financing beyond their country envelopes through the World Bank's CRW and ADB's DRF+ (Box 5). IDB does not have a similar option, which is likely because only three countries are currently eligible for IDB concessional financing. IDB provides grants under special programmes, while loans and technical assistance account for the bulk of its portfolio.

Climate resilient debt clauses (in MDB loans)

Both IDB and the World Bank have reduced the transaction fees governments pay for their CRDCs by 50% and 100%, respectively. Initially, IDB required borrowers to pay a transaction fee of 0.10% per annum on the outstanding loan balance to activate the CRDCs in an IDB loan; this was reduced to 0.05%. The World Bank also initially charged governments a fee of 0.05% in 2023; but as of June 2024, it started offering CRDCs to all eligible borrowers at no cost to them. Instead the fee is covered by concessional resources, such as the Liveable

25 For Asian Development Fund-financed CDF operations, the capital is fully committed at the time of approval. However, for regular operations financed with ordinary capital resources (OCR) and concessional OCR lending, the borrower country can choose to either commit capital at the time of approval or allocate resources from within its existing available resources for that year and/or from unapproved projects under preparation following a subsequent disbursement request (ADB 2019a). For OCR-financed operations, there is a front-end fee of 0.10% if funds are allocated following the disbursement request.

Planet Fund or other donor support (World Bank 2024c). No formal explanation was publicly given for these changes in either case, but it is likely related to countries seeing this transaction fee as a barrier to the uptake of CRDCs.

Importantly, while MDB CRDCs have little to no upfront cost to governments, deferring interest (and other loan charges) will result in these deferred amounts accruing regular loan interest (interest on interest), which will increase the total monetary amount of debt repayments, often over a shorter time period, while keeping the net present value of payments the same following the deferral period. Furthermore, in the case of a variable rate loan, the borrower will not have the final payment amounts until the end of the deferral period.

Box 6: Note on risk transfer instruments

Unlike instruments directly funded by MDB balance sheets, risk transfer instruments such as cat bonds and sovereign insurance from regional pools apply risk-based pricing to determine premiums. Premium levels are primarily determined by expected losses (given selected policy parameters). Other factors, including reinsurance and operating costs, also inform premium levels. The affordability of a premium, alongside other factors, is a barrier to uptake (World Bank 2023c). The premium presents an up-front cost, which may not produce a financial return in the near (or even medium) term. Moreover, countries can experience 'payment fatigue' if multiple years go by without a payout, making it difficult to secure budgetary commitment every year. The rest of this section discusses the affordability challenges for cat bonds and risk pool insurance products separately.

Catastrophe bonds (via MDBs)

Cat bonds, even those intermediated by the World Bank, are commercial transactions transferring the risks of high-intensity low-frequency disasters from the sponsoring government to specialised capital market investors. The price of a cat bond is therefore highly dependent on market conditions. Partly due to the hardening of insurance markets since 2021, recent repeat issuances via the World Bank in 2023 and 2024 were significantly more expensive, with a 14–83% increase in the cost per unit of expected payout (see Box 7 for further details).

Moreover, regardless of market conditions, transaction costs related to the design, structuring, and placement of the cat bond[26] are also relatively high compared with other instruments, in the order of a minimum USD1 million up to USD2 million. For example, the 2021 Jamaica cat bond issuance that secured USD185 million in financial protection had an estimated transaction cost of USD1.5 million, which was incurred by the World Bank Treasury (World Bank 2021). The high transaction cost was due to the instrument being public securities and hence the need to follow established market practice; for example, the requirement for a third-party risk modeller to quantify the risk of financial loss to the investor, which is included in the bond offering materials. Given these high costs, cat bonds are usually taken out for substantial amounts of money, which can translate into high coupon payments. However, according to the World Bank, these fixed transaction costs would be higher without its assistance as a Special Purpose Vehicle would need to be established to hold the proceeds of the bonds (Baca and Jain 2018, World Bank 2022a). The World Bank cat bond platform also facilitates joint issuances by countries (such as the Pacific Alliance cat bond in 2018) to share structuring costs and with greater volume, potentially helping to attract greater investor appetite.

26 These include legal fees, structuring agent, modelling agent and calculation agent.

Box 7: Prices of recent sovereign cat bond issuances under the World Bank programme

The World Bank intermediated five new sovereign catastrophe bonds in 2023 and 2024 for the Governments of Chile, Jamaica and Mexico, providing a range of parametric earthquake and tropical cyclone instruments. These are all repeat issuances, providing protection for countries against the same event types for essentially the same risk level, but at a markedly higher cost than when they were previously issued. The main change in price is due to changes in the pricing environment in the capital markets over time, rather than relating to any other factors, such as changes in modelled risk.

Comparing the risk multiples, which describe the cost per unit of expected payouts, of the most recent and previous issuance reveals that issuances in Chile, Jamaica and Mexico were between 14% and 83% more expensive than the previous issuance in 2018–2021 (as summarised in Table 6).

Table 6: Prices of recent and previous sovereign cat bond issuances under the World Bank programme

Issuance		Previous issuance		Recent issuance		Approximate change in price per unit coverage (%)
		Year	Risk multiple	Year	Risk multiple	
Chile earthquake		2018	2.91	2023	4.75	+63*
Mexico earthquake	Higher-risk tranche	2020	1.56	2024	1.88	+21
	Lower-risk tranche		3.89		4.44	+14
Mexico tropical cyclone	North Atlantic		1.73		2.37	+37
	Pacific		1.60		2.93	+83
Jamaica tropical cyclone		2019	2.89	2024	4.67	+61

Source: Centre for Disaster Protection based on data collated from Artemis.bm and World Bank press releases

While development partners can help cover the premiums and transaction costs associated with cat bonds, this is rare. Two cat bonds issued under the World Bank's programme have benefitted from donor support. Intermediated by the World Bank in 2021, the Jamaica cat bond provided financial protection of up to USD185 million and received a USD16 million grant from a multi-donor trust fund administered by the World Bank and a grant from the US to fully pay the premium and transaction costs. The government's fiscal consolidation efforts[27] were explicitly identified as the factor that 'gathered donor support for this Project, the first investment project financing that supports CAT bond issuance' (World Bank 2021). Notably, unlike the original cat bond transaction, the Government of Jamaica largely covered the risk premium and transaction costs of its second issuance in 2024 with its own funds (Letelier 2024; Artemis 2024f). The cat bonds issued under the now closed PEF was also fully funded by development partners, which covered approximately USD76 million in premiums.

Sovereign insurance (via regional risk pools)

The provision of affordable insurance premiums is a strategic priority for all four risk pools. As noted above, risk pools, like cat bonds, use risk-based pricing to determine the premiums payable for each country

27 After decades of chronic macroeconomic imbalances, with the support of international financial institutions, the Government of Jamaica in 2013 embarked on a programme of sustained annual primary surpluses that stabilised the economy and significantly reduced the government's public debt burden.

contract. In addition to the risk or expected loss, the premium markup comprises operational, technical and modelling costs (Vivideconomics 2016). Risk pool premiums are one of the main barriers to country uptake, retention and increasing coverage, with many countries purchasing coverage based on what they can afford rather than what they need.[28]

Several development partners, including MDBs via concessional loans,[29] have historically supported countries in paying all or a portion of their insurance premiums. Development partners' attitudes and approach to premium support has also softened significantly over the past 3–5 years. Premium support was originally seen as a short-term mechanism to help demonstrate the benefits of insurance and thereby build demand among countries, with the intention that they would be phased out over time as governments took on their full cost. Development partners were also reluctant to pay premiums over the medium to long term on the grounds that it would undermine the incentive structure that risk pools were attempting to introduce, whereby by paying premiums in full, member countries would internalise their financial exposure to climate risks and stimulate cost-effective investments to reduce them (DfID 2014, 2016, 2017).

However, several development partners are now questioning these assumptions and recognising the need for longer-term support that better reflects countries' fiscal realities (Martinez-Diaz et al. 2019; Bertram and Chowdhary 2023). Several factors have contributed to this change. It was increasingly recognised that risk pool premiums were unaffordable to most lower-income countries given their budgetary constraints. This became more pronounced following the recent deterioration in the fiscal situation in several countries. Attitudes further changed following the growing political support for the loss and damage agenda, which increasingly questioned whether the countries that were worst affected by climate change and least responsible for causing it should be the ones to foot the bill (Mustapha and Williams 2023). Additionally the use of loans, even concessional ones, to pay for insurance premiums has raised questions about long-term debt sustainability for countries with increasing debt obligations, and about the opportunity costs given competing development and public investment needs (Panda et al. 2021). In light of these developments, there has been a significant increase in premium support available to the regional risk pools and their members since 2020 through programmes such as ADRiFi and the Global Shield against Climate Risks. These initiatives are seeking to support countries in accessing needs-based technical and financial support for PAF instruments (see Box 8).

Box 8: Recent initiatives supporting governments to scale up pre-arranged financing

AfDB's Africa Disaster Risk Financing Program (ADRiFi) is a collaboration between AfDB and ARC which was launched in 2019. Compared with previous initiatives, it uses a more flexible approach to provide premium support for countries. The programme provides cover to countries buying ARC insurance with direct premium support of up to 50% of total premiums over a five-year period. Countries may also use concessional financing from AfDB to pay for their own half of the premium.

The Global Shield against Climate Risks is a joint initiative of the Vulnerable Group of Twenty (V20) and the Group of Seven (G7) that aims to provide and facilitate more and better pre-arranged protection against climate- and disaster-related risks for vulnerable people and countries. An in-country process is used to facilitate greater understanding and informed decision-making by governments on risks, vulnerabilities, protection gaps and the potential role of different DRF interventions and instruments in addressing these gaps. The in-country process is ongoing in 13 countries[30] and will be accompanied by learning and evaluation to inform iterative improvements in the process. Intended participants include country representatives, local civil society, affected and targeted groups, DRF stakeholders, local and international private sector actors, and international development organisations such as the UN and World Bank.

28 For example, due to fiscal constraints the Government of the Gambia raised its ARC policy attachment point in 2019. Despite a drought occurring, the attachment point was not reached and no payout was received; this was in contrast to a very large payout received by its neighbour Senegal. There has also been a steady reduction of coverage by Niger, related to affordability, as the budget has been reallocated to combat the terrorism threat on the country's borders (FCDO 2020).

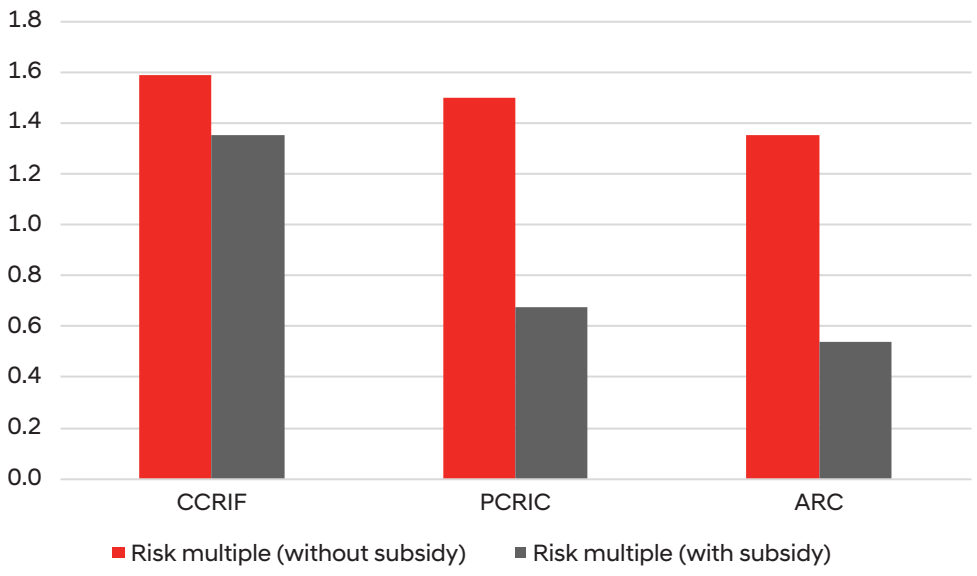
29 In the first 3–4 years of CCRIF's operation, four Eastern Caribbean countries (Dominica, Grenada, St Lucia, and St Vincent and Grenadines) used IDA financing to cover the cost of entrance fees and insurance premiums.

30 A regional approach is being taken for the Pacific countries.

The country members of all four risk pools currently receive premium support, with ARC and PCRIC members being the most subsidised. Development partners paid around 60% of ARC's premiums for sovereign drought policies in 2021 (ARC 2023). This proportion is likely to have increased in recent years through programmes such as ADRiFi. Development partners also covered about 55% of the premium on average for the insurance policies issued by PCRIC for the 2023 policy year. However, the levels of concessionality for individual 2023 insurance policies under PCRIC ranged between 32% and 84%. The premium payment of Lao PDR's first SEADRIF policy was also completely covered by an IDA project[31] (Floissac and Marie 2024). And while most CCRIF member countries currently pay the majority of their own premiums (Martinez-Diaz et al. 2019), premium support has frequently been provided to incentivise CCRIF countries to increase their coverage or to maintain coverage during hard economic times, such as during the pandemic (CCRIF 2023a).

Unlike the cat bonds, the expected risk multiples are not publicly available for the regional risk pools' transactions. However, based on a mix of publicly available information for CCRIF and ARC, as well as information obtained from PCRIC directly, risk multiples (without subsidies) range from 1.3 to 1.6 (World Bank 2021; Kramer et al. 2020). Adjusted for the most recent subsidies received, the risk multiples range from 0.54 to 1.35 as shown in Figure 9. In other words, for every USD1 in payouts, the country is expected to pay USD1.30–1.60 in premiums (without subsidies) and USD0.54–1.35 (with subsidies). Ultimately, more and better premium support – for example multi-year support – is increasingly seen as key to scaling up coverage from the regional risk pools.

Figure 9: Modelled risk multiple for regional risk pools (with and without subsidy)



Note: SEADRIF is not included as the risk multiple is only for one country.

Source: Centre for Disaster Protection based on ARC (2023); CCRIF (2023a); Kramer et al. (2020); World Bank (2021b); and data provided by PCRIC for policy year 2023

31 The premium was covered by a grant from the Southeast Asia Disaster Risk Insurance Facility Program Multi-Donor Trust Fund administered by the World Bank as well as an IDA credit.

5.3. Financial efficiency

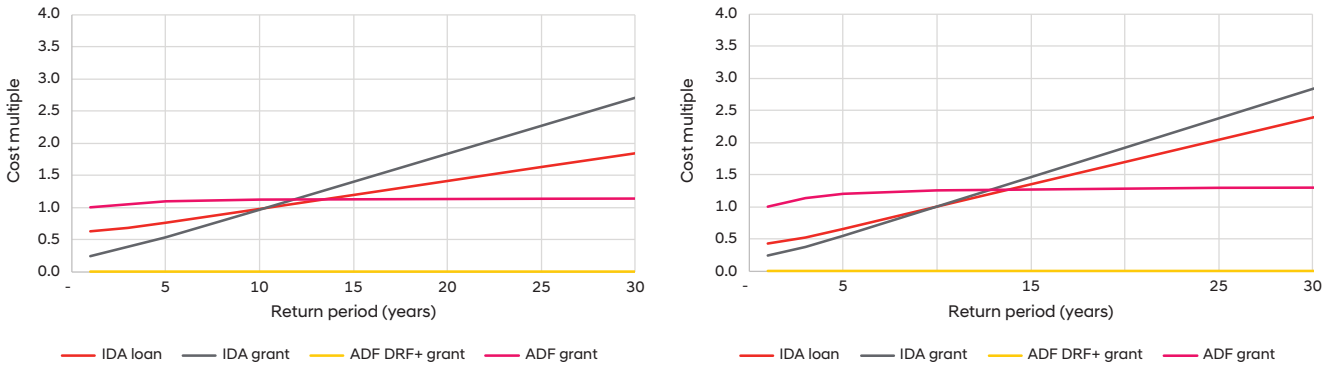
SUMMARY

This section presents the findings from a comparative analysis of the cost multiple of each instrument (excluding CRDCs), which estimates the average full economic cost of an instrument to a government compared with the average amount received by the government. The cost multiples for the MDBs' contingent loans and grants and cat bonds were estimated based on several simplifying assumptions, while the cost multiples of the sovereign insurance from regional pools were based on their risk multiples. PCRIC directly provided an estimate of its multiples for policy year 2023 which risk multiples for ARC (Kramer et al. 2020) and CCRIF (World Bank, 2021b) were obtained from publicly available information.

Based on this analysis:

- Comparing the MDBs' grants and concessional loans, ADB contingent grants financed by the DRF+ have the lowest cost multiple, which is constant at zero across all return periods. This is because it is completely funded by additional resources outside of the country envelope and there are no fees or repayment costs.
- The ADB grant, which is completely funded from the country envelope, becomes more attractive than the IDA grant and loans at higher return periods due to this deferred disbursement option, which allows a country to draw down on the undisbursed grant at the end of the grant term.
- Comparing the three MDBs' non-concessional loans, the World Bank's non-concessional contingent loan (IBRD Cat DDO) has the highest cost multiple compared with the other two MDBs. Notably, this gap between the World Bank and other two MDBs is less pronounced, at a 5% discount rate, with the IBRD loan cost multiple falling drastically across almost all return periods. This is because we assume that the lower the discount rate, the lower the opportunity cost from assigning part of the country envelope to a contingent loan.
- Cost multiples of the two risk transfer instruments, cat bonds and sovereign insurance (via regional risk pools) differ significantly, with the latter being constant across return periods due to the pricing policy of regional risk pools. The risk multiples of ARC and PCRIC insurance are significantly lower than those of CCRIF and cat bonds, in part due to higher donor subsidies.
- Out of all the PAF instruments potentially available for lower-income countries in Africa, ARC – when subsidised and based on its risk multiple in 2020 – has the lowest risk multiple from around return periods of 1-in-6 years.
- An IDA Cat DDO grant is 100% subsidised, whereas ARC is only 60% subsidised, yet ARC still has the lowest cost multiple for countries for certain risks

Figure 10: Cost multiple of multilateral development bank grants and concessional loans (Left: Discount rate of 5%. Right: Discount rate of 10%)



Source: Haq et al. forthcoming

Among the MDB concessional grants and loans, ADB's DRF+ grant has a constant zero cost multiple, whereas the cost multiple of IDA grants and loans increases for high-return periods.

Cost multiples for all instruments and return periods can be found in Annex 4. Comparing the MDBs' grants and concessional loans, ADB contingent grants financed by the DRF+ have the lowest cost multiple, which is constant at zero across all return periods. This is because it is completely funded by additional resources outside of the country envelope and has no upfront fees or repayment costs. In contrast, while initially low, the cost multiple of IDA grants and loans increases at higher-return periods because 25% of grants and loans is financed from the country envelope, whereas the ADB grant, which is completely funded from the country envelope, becomes more attractive than the IDA grants and loans from around a return period of 1-in-12/13 years because of the deferred disbursement option.[32]

Out of the three MDBs' non-concessional loans, the World Bank IBRD Cat DDO has the highest cost multiple across all return periods.

The World Bank's non-concessional contingent loan (IBRD Cat DDO) has the highest cost multiple compared with the other two MDBs because 100% of the IBRD Cat DDO comes from the country's allocation of MDB resources, which are committed at approval (unlike the IDB CCF loan which is uncommitted at approval). Moreover, unlike the ADB loan, the IBRD loan does not include a deferred disbursement option.

Notably, this gap between the World Bank and other two MDBs is less pronounced at a 5% discount rate compared with a 10% discount rate, with the IBRD loan cost multiple falling drastically across almost all return periods. This is because the opportunity cost of using part of the country envelope for contingent credit is lower with lower discount rates, and at 5% it is zero.

However, a country should consider additional factors not captured by this analysis. For example, the IDB's non-concessional loan (CCF) is not designed to be disbursed for very low-return period events. Thus, although the CCF is cheaper at a 10% discount rate compared with the World Bank's IBRD loan, countries may not be able to access it for these return periods.

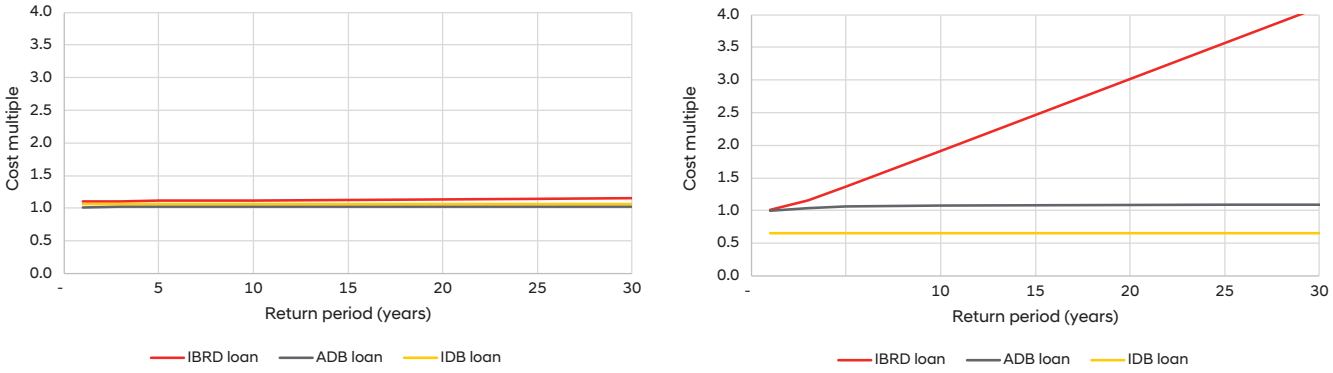
Cost multiples of risk transfer instruments, cat bonds and sovereign insurance via risk pools differ significantly.

The World Bank-issued cat bond line slopes upwards, as would the line for commercial insurance.[33] In contrast to cat bonds, the risk multiples of sovereign insurance from risk pools are constant across all return periods, as shown

32 There is a small section in between when an IDA loan has the lowest multiple – from around 1-in-10 to up until when ADB grant takes over (for both 5% and 10% discount rates).

33 Partly due to the increasing cost of capital for taking on more extreme risks.

Figure 11: Cost multiple of multilateral development banks' non-concessional loans (Left: Discount rate of 5%. Right: Discount rate of 10%)

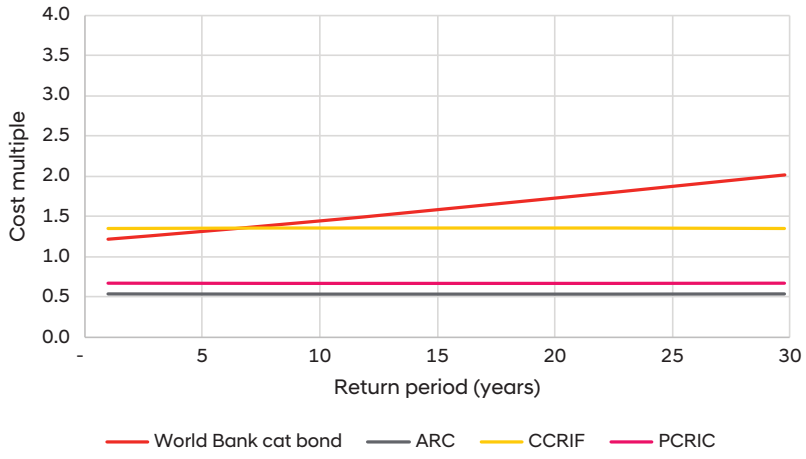


Source: Haq et al. forthcoming

in Figure 12. This is because risk pools have made a policy decision to generally charge fixed multiples across countries given their explicit development objectives. The country difference is captured via the risk-based pricing element of the premium, with the fixed percentage mark-up implying a greater contribution to administrative and other costs from higher-risk policies. Risk multiples vary across regional risk pools due to a variety of factors such as differences in risk profiles of member countries, business models, quality of models and degree of reliance on capital vs reinsurance strategies. For example, one risk pool may have a higher-risk multiple than another because it covers low-probability risk and it is statistically correlated with US storm risk.

Among the four risk transfer instruments, the risk multiples of ARC and PCRIC insurance are significantly lower than those of CCRIF and cat bonds. Moreover, although World Bank-issued cat bonds have a lower risk multiple than subsidised CCRIF below 1-in-5 year return periods, it is unlikely that a cat bond would be used for such low return periods because of the high design costs of setting up a cat bond (as discussed in Section 5.2), which are not captured in this cost multiple analysis. Previous attachment probabilities for World Bank-issued cat bonds range from approximately 1-in-10 years to 1-in-90 years.

Figure 12: Comparing the cost multiples of risk transfer instruments



Note: Results do not vary with discount rate

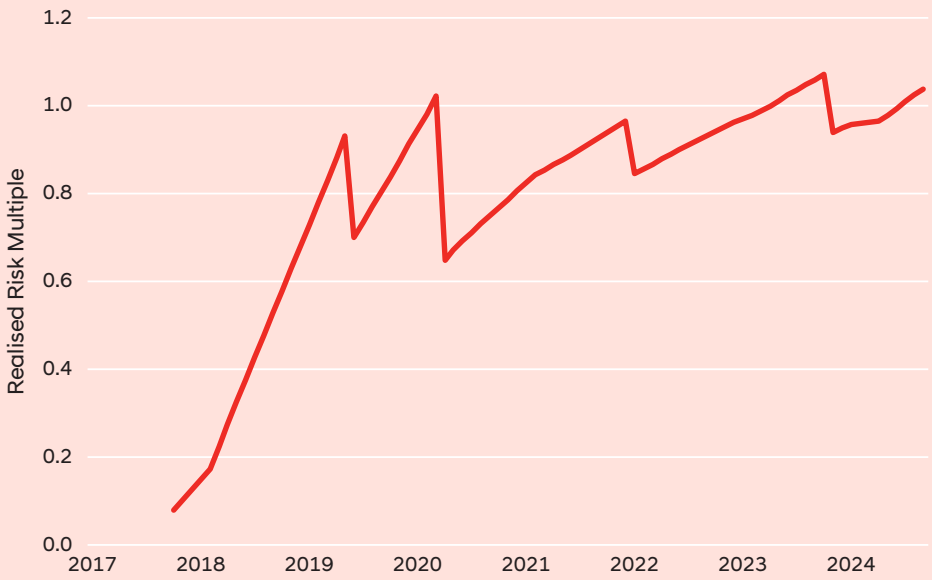
Source: Haq et al. forthcoming.

Box 9: Realised risk multiples of World Bank cat bonds and Caribbean Catastrophe Risk Insurance Facility

It is worth noting that the estimates for risk transfer instruments used in this section are all based on risk models either developed by the risk pool or by a risk modelling firm hired to support the cat bond transaction. Different risk modellers may have different views of the risk and this would lead to different multiple estimates. It is therefore useful to use historical payouts to compare realised risk multiples with the modelled risk multiples. This comparison could be done for cat bonds and CCRIF using publicly available information.

Cat bonds are used to provide financial protection for more extreme, lower-frequency events – the modelled annual attachment probabilities of cat bonds in the analysis range from 1.09% to 9.44%. The risk metrics provide an estimated view of risk, and across the 50 policy years, the actual payouts are expected to be different to what the models predicted. Based on cat bond issuances and payouts between 2017 and September 2024, World Bank cat bonds have a premium to payout ratio of approximately 1.04.[34] This implies that USD1 of payouts have been made for every USD1.04 spent on cat bond premiums. This is below the expected multiples for cat bonds across all return periods. Notably, this metric provides a snapshot view at a particular point in time. Figure 13 shows the fluctuations in realised risk multiple since 2017. CCRIF's realised multiple (net of premium discount) between 2013 and 2023 was 1.42 and thus close to its expected risk multiple of 1.4.

Figure 13: Realised risk multiple of World Bank cat bonds (2017–2024)



Note: analysis is based on simplifying assumptions about the timing of payouts and associated reduction in premium payments, so actual price paid estimates may differ from what is presented here.

Source: World Bank press releases and Artemis (2024a).

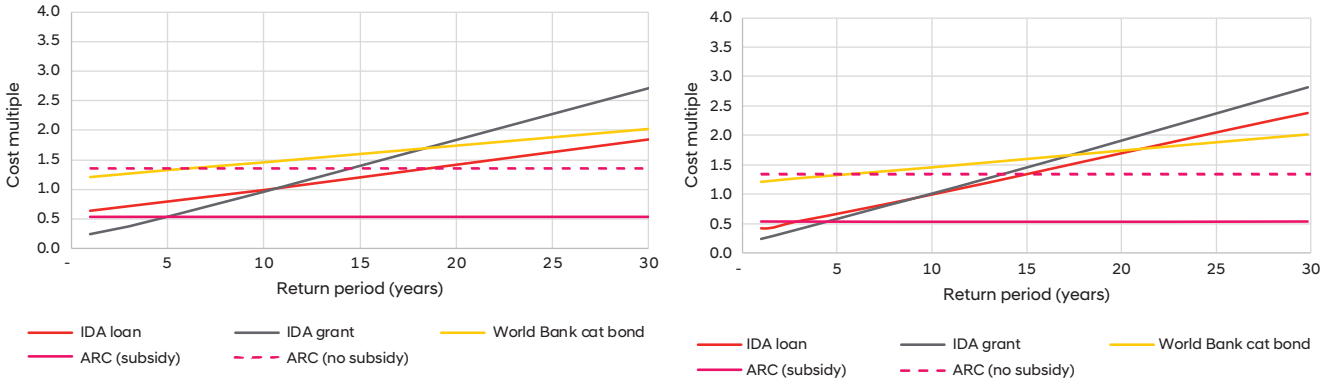
34 This is based on a cumulative premium of USD475 million and cumulative payout of USD455 million on sovereign cat bonds intermediated by the World Bank.

Of all the potential PAF instruments theoretically available for countries in Africa, ARC (when subsidised) has the lowest cost risk multiple from around return periods of 1-in-6 years.

Some PAF instruments are only available to certain regions of the world. From a country perspective, it is helpful to compare instruments available to particular regions. For illustrative purposes, an example focused on Africa is therefore presented. Cat bonds are included even though no country in the region has sponsored a cat bond to date.

For very low return periods, IDA grants have the lowest cost multiple for countries in Africa but this changes from around 1-in-6 years (Figure 14). As described above, this is because countries forgo some concessional financing for other purposes in arranging contingent IDA grants and loans. Consequently, ARC, for which development partners have recently subsidised 60% of the 1.35 risk multiple, has the lowest cost multiple to countries for most return periods. If unsubsidised, ARC's risk multiple of 1.35 is still below that of cat bonds for return periods above six years.

Figure 14: Cost multiples of potential PAF instruments for countries in Africa (Left: Discount rate of 5%. Right: Discount rate of 10%)



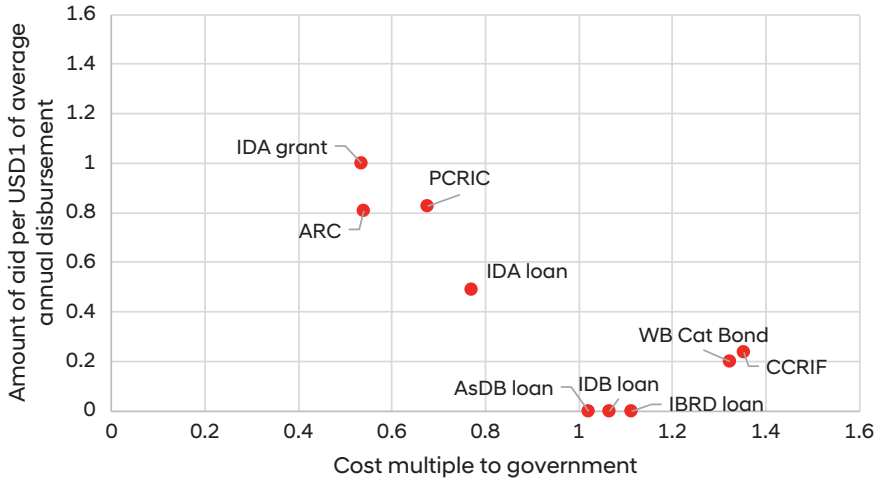
Source: Haq et al. forthcoming.

Considerable donor funds are used to reduce the cost multiple of most instruments for countries.

As intuitively expected, instruments that have the lowest cost multiple to countries tend to be associated with more donor funding and subsidies. Comparing the cost multiple for countries and donors' contribution to each instrument (Figure 15) reveals a largely negative relationship between the cost to countries and the amount of aid that goes into reducing the cost to countries.

However, while the IDA Cat DDO grant is 100% subsidised and ARC is 60% subsidised, ARC is cheaper for countries (in terms of the cost multiple) for certain risks based on the assumptions in this model. This has an opportunity cost to donors as grants provided to clients in effect reduce IDA's equity on a one-to-one basis and IDA's financial model involves leveraging its equity to access funds from the market (World Bank, 2024a).

Figure 15: Comparing cost multiples for government and donor contributions at a 5% discount rate



Note: Results at 1-in-5 year return period

Source: Centre for Disaster Protection based on Haq et al. forthcoming.

5.4. Timeliness

SUMMARY

- **Timeliness of disbursements and payouts to governments:** all instruments are rated 'poor' for early action as none have been triggered based on forecasts or early warning information before a hazard fully materialises. With respect to the other three areas of timeliness – response, early recovery and reconstruction – contingent loans and grants from MDBs perform best. The record is more mixed for cat bonds issued via the World Bank and sovereign insurance from some of the risk pools, particularly ARC. Payouts from World Bank-issued cat bonds and ARC policies have experienced several delays in calculation and verification procedures for assessing the parametric trigger for certain hazards.
- **Timeliness of utilisation of disbursements and payouts by governments:** the track record for the speed of utilisation of funds by governments is largely unknown, with the exception of IDB's CCF and ARC's drought product. This is because most instruments are provided as general budget support; as a result their providers cannot track when and how funds are used in a rigorous manner. IDB's disaster contingent loans via the CCF and ARC's sovereign insurance are the notable exceptions, with explicit targets in place regarding the timing of the actual utilisation of funds and robust means of verification. In the case of IDB, its time frame of 180–270 days is always achieved, while ARC is less consistent in meeting its two targets: (a) implementation of the response within 120 days of payouts and (b) completion of the intervention within the next 180 days.

All the PAF instruments assessed in this report are explicitly designed to provide governments with quick access to financial resources after a disaster, reflecting their use of soft and parametric triggers. Triggers are either a declaration of an emergency or based on parameters corresponding to a severe or catastrophic disaster event. This enables most instruments to be used to fund response, early recovery and reconstruction after the occurrence of an event. However, none of the instruments covered in this report are currently used to finance early action (as defined in this paper).

Timeliness of disbursements and payouts to government

Contingent disaster loans and grants

The World Bank Cat DDO, ADB CDF and IDB CCF (Modality II) apply soft triggers, typically based on the declaration of a state of emergency by the government. Such declarations are typically made very rapidly in the event of major disasters as they are required to activate government emergency procedures and government-own emergency financing. In principle, a government could also trigger its MDB contingent disaster loans and grants through an early declaration of a state of emergency where permitted by related legislation. However, in practice there is no evidence of governments using contingent disaster loans and grants with soft triggers to finance early action based on forecasts of imminent sudden-impact events or during the early stages of slow-onset events.

However, once a country makes the declaration and notifies the MDB, the MDB then acts quickly to verify this is in accordance with the country's legal framework.[35] This process is facilitated by MDBs ensuring that these legal arrangements are in place during the loan approval process. Instruments using soft triggers have disbursed financing very rapidly, typically within a few days after a declaration of emergency. For example, disbursements of ADB's CDF loan and grant proceeds under the Pacific Disaster Resilience Program (Phases 1 and 2) began on average of 3.3 workdays after governments submitted applications of withdrawal (ADB 2023b). The programme's first disbursement for the Tropical Cyclone Gita response in Tonga in 2018 was on the same day as the emergency declaration.

To ensure timely disbursement, the World Bank has also worked closely with governments to develop an operational manual. For its first Cat DDO in Colombia, the manual established clear and step-by-step procedures that the World Bank and the government would follow for disbursing the loan. The manual assigned each agency specific roles and responsibilities in the loan disbursement process and stipulated that the government would carry out a simulation exercise at least once a year. According to the World Bank's evaluation, these measures may have helped with the eventual fast disbursement of the loan within three days of receiving the government's request to access the Cat DDO funds (IEG 2017a).

Modality I of IDB's CCF based on a parametric trigger also disburses relatively quickly after an eligible event. IDB's parametric trigger is a function of the event's intensity and the population affected (IDB OVE 2016). Once a (potentially) eligible event has occurred and the borrower requests that IDB verifies the eligibility of the disaster, IDB performs two verifications: (i) it determines the eligibility, according to the type of event, magnitude and population affected, and calculates the maximum disbursement amount; and (ii) it verifies that the borrower is advancing with the execution of the Comprehensive Disaster Risk Management Plan in a manner satisfactory to IDB. After these two verifications, IDB informs the country whether or not the event was eligible, and if so, the maximum amount of resources it can access. If the country requests disbursement, loan documents, including agreement on the source of financing then have to be prepared since the CCF is an uncommitted facility (as described in Section 2).

Despite these multiple steps, the average time between a government's request to verify the eligibility of an event and IDB's response under Modality I is four days (IDB 2021, 2023b).[36] IDB CCF operating guidelines seek to verify compliance with disbursement conditions and determine eligibility within 10 business days of a government request (IDB 2021), but in practice this has taken much less time. Disbursement is also very prompt according to available evidence, provided within five business days of the disbursement request. The speed of the CCF is generally attributed to two factors: (i) the quality of the coverage model and methodology, which makes it possible for IDB to quickly verify the eligibility of an event internally (discussed in Section 5.5); and (ii) clear internal processes, operational guides and responsibilities that ensure a prompt response by IDB to the country's request (IDB 2019, 2024a, 2024b).

35 Some countries' disaster laws did not cover public health emergencies and thus had to be amended before a country could declare an emergency and trigger its World Bank CAT DDOs during the covid-19 pandemic.

36 Based on project completion reports for CCF disbursements to Ecuador in 2016, the Dominican Republic in 2017 and Nicaragua in 2020. Project completion reports for disbursements to the Bahamas in 2019, Nicaragua in 2022 and El Salvador 2022 are in preparation.

Moreover, MDB contingent disaster loans and grants are generally faster than ex-post MDB recovery and reconstruction assistance. On average, ADB took almost four months (15.7 weeks) from the date of request to approve 28 emergency assistance loans between 2004 and 2018 (ADB 2019b). ADB and other MDBs make a significant allowance for retroactive financing of agreed activities under emergency projects, to some extent offsetting the time taken to process ex-post support. Nevertheless, contingent financing tools disburse far more rapidly and, moreover, remove ex-post loan processing and negotiation demands on government time.

The World Bank Cat DDO, IDB CCF and ADB CDF are all scored as 'poor' for early action but 'good' on timeliness of disbursements for response and early recovery. The World Bank and ADB also score 'good' for reconstruction purposes, while no score is given for IDB as its policies explicitly state that the CCF cannot be used to finance reconstruction.

Climate resilient debt clauses (in MDB loans)

Although one country (St. Vincent and the Grenadines) triggered its CRDCs in its World Bank loans in 2024, CRDCs are not rated due to insufficient publicly available information.

Catastrophe bonds (via MDBs)

The cat bond record is more mixed based on the payouts made to date on five World Bank-issued cat bonds.[37] Reasons for slower payouts vary, ranging from issues in the timeliness of reporting of final event parameters to the complexity of the calculation process for modelled loss-type triggers, such as for the Philippines cat bond. Earthquake calculation reports have taken an average of 15 days for completion based on the experience of Mexico in 2017 and Peru in 2019 (Artemis 2017, 2019).[38] However, calculation reports for tropical cyclones have taken notably longer based on the experiences of Mexico and the Philippines. The Government of Mexico waited 4–6 months after two tropical cyclone events for the determinations that eventually resulted in payouts. This was largely due to a time lag in the release of the US National Hurricane Center's final tropical cyclone report, in turn requiring time to determine the storms' parameters, including the minimum central pressure of the storms (Artemis 2024c, 2024e). The Government of the Philippines in several instances also waited 4–5 months for verification reports that did not result in payouts (Artemis 2024b). On average, the length of time between the estimated date of an event and the decision date that led to payouts for five cat bonds was roughly two months for all hazards.

Note, however, that parametric triggers for cat bond transactions are customisable, and issues relating to delays in the reporting of event parameters and complexity of the post-event loss calculation process can in principle be addressed by using more preliminary event data and streamlining calculation processes. There is some evidence to suggest that more recent tropical cyclone cat bond triggers use earlier event report data, which should in principle address issues relating to delays in the reporting of final event data.

37 This includes the Mexico MultiCat 2012 bond, Mexico Earthquake (IBRD CAR 113-2017), Peru Earthquake – Pacific Alliance (IBRD CAR 120-2018), Philippines Typhoon (IBRD CAR 124-2019) and Mexico Pacific Hurricane (IBRD CAR 128). It excludes the Pandemic Emergency Financing Facility (PEF) cat bond.

38 The determination of whether a payout was due on Peru's earthquake catastrophe bond in 2019 took roughly 24 days. That is aligned with the transaction terms, that allowed the calculation agent 20 calendar days to complete its assessment and make a determination on whether the notes had been triggered by an earthquake, with a further five days allowed as well to deliver the finalised calculation report (Artemis 2019).

Table 7: Length of time between disaster event and payout decision

Cat bond	Event	Estimated date of event	Date of decisions that led to payouts	Length of time
MultiCat Mexico (Series 2012-1)	Tropical cyclone	23 October 2015	9 February 2016	3.5 months
Mexico Earthquake (IBRD CAR 113-2017)	Earthquake	7 September 2017	1 October 2017	24 days
Peru Earthquake – Pacific Alliance (IBRD CAR 120-2018)	Earthquake	26 May 2019	1 June 2019	6 days
Philippines Typhoon (IBRD CAR 124-2019)	Tropical cyclone	16 December 2021	1 January 2022	16 days
Mexico Pacific Hurricane (IBRD CAR 128)	Tropical cyclone	25 October 2023	1 April 2024	5 months

Source: Artemis (2017, 2019, 2024b, 2024c and 2024e).

Furthermore, while the date of decision from the verification process is publicly available, the date of cat bond payouts is not. Contractual terms can add further delays even after a determination that a payout has been triggered. This is because payouts are typically disbursed following the next interest payment due date and the value of the bond written down accordingly (World Bank 2017a). Publicly available cat bond prospectuses under the IBRD Capital at Risk Notes programme indicate that at least in some cases interest payments are made monthly (World Bank 2017a, 2019). The programme offers an option to receive payouts within a few days 'of an event' but is typically not taken up.

In view of the information available, cat bonds are scored as 'poor' for early action, 'fair' for response and early recovery, and 'good' for reconstruction.

Sovereign insurance (via regional risk pools)

All four risk pools have largely made payouts within 30 days of an eligible event, and in several cases, in even less time. According to CCRIF, it has made all of its payouts within its target of 14 days of an event, meriting a 'good' rating for response, early recovery and reconstruction (CCRIF 2022b). However, CCRIF does not consistently provide detailed publicly available information on the actual date of its individual payouts.

PCRIC has a target to make a full insurance payout within 30 days of the occurrence of a covered (insured) event. In practice, it has been much quicker. Under PCRAFI, two payouts were made within 14 days of the disaster, while PCRIC directly made a payout to Tonga within eight days of Tropical Cyclone Gita making landfall. However, following Tropical Cyclone Harold in 2020, PCRIC took 32 days to make a payout due to covid-19-related delays from the calculation agent and, more importantly, delays by the banks PCRIC used to process the payment. Given that all other payments were made within 14 days and that the delay of the payout following Tropical Cyclone Harold was minor and explained in part by the impact of covid-19, PCRIC is scored 'good' for response, early recovery and reconstruction.

SEADRIF has made only two payouts to date, both in 2023 from its non-parametric component, which is discussed in Section 5.5. The payouts were made just one business day after the Government of Lao PDR submitted the claims. According to SEADRIF (2024) one payout was to support the response to the current flooding at that time, while the second claim was to support remaining reconstruction tasks after a tropical storm caused flooding a year before, in August 2022. This implies the government took 12 months to request payout against the 2022 tropical storms and floods.

However, it should be noted that the timeliness of payouts under SEADRIF's parametric component has yet to be tested. Therefore, SEADRIF is 'not rated' against speed of payout for response, early recovery and reconstruction.

ARC seeks to make payouts within 30 days from when a payout is triggered, which ARC defines as the point at which a country is alerted that a payout will be made. Based on an evaluation of four payouts in the period up to financial year 2021/22, ARC has largely achieved this key performance indicator for ARC drought insurance payouts for at least two-thirds of member countries. In addition, no payouts took longer than 40 days (OPM 2022). Based on the time frames defined for this sub-criterion, ARC is scored as 'fair' for response, and 'good' for early recovery and reconstruction.

It is worth noting that while risk pools are scored as 'poor' for early action, it is an area some are exploring. ARC is working with the UN Office for the Coordination of Humanitarian Affairs to pilot an anticipatory insurance product to complement ARC's traditional insurance product in Malawi and Zambia. The product will enable payouts when forecasts predict drought will cause significant loss and damage rather than after loss and damage has occurred. For example, there may be a trigger based on pre-seasonal forecasts that could activate anticipatory action, leading to the provision of alternative varieties of seed at the beginning of the agricultural season (Maslo 2022). In addition, using resources from a multi-donor trust fund, the World Bank has commissioned Willis Towers Watson to develop tailored drought policies for countries, with the intention for PCRIC to issue these policies starting in 2025. The proposed framework includes a dual trigger, with an initial payout for early action and a second payout for rapid response should conditions continue to deteriorate. While there may be relatively limited scope for early action in the context of sudden-impact events, it could potentially make a tangible difference in the context of slow-onset hazards such as drought (Pople et al. 2021).

Table 8: Timeliness of PAF payouts and disbursements to governments

Instrument/provider	Early action	Response	Early recovery	Reconstruction
Contingent disaster loans/grants				
ADB (CDF)	🔴	🟢	🟢	🟢
IDB (CCF)	🔴	🟢	🟢	Not applicable
World Bank (CAT DDO)	🔴	🟢	🟢	🟢
Climate resilient debt clauses				
IDB	🔴	⚫	⚫	⚫
World Bank	🔴	⚫	⚫	⚫
Cat bonds				
World Bank	🔴	🟠	🟠	🟢
Sovereign insurance				
ARC	🔴	🟠	🟢	🟢
CCRIF	🔴	🟢	🟢	🟢
PCRIC	🔴	🟢	🟢	🟢
SEADRIF	🔴	⚫	⚫	⚫

Legend: green = good; amber = fair; red = poor; grey = not rated due to insufficient information.

Note: while IDB CCF would be scored as 'good' for reconstruction based on this metric, IDB eligibility rules preclude its use to finance reconstruction; it is therefore rated as 'not applicable'.

Source: Centre for Disaster Protection.

Timeliness of utilisation of disbursement and payouts by government

A second, critical dimension of timeliness concerns the speed with which governments actually use the financing received to fund expenditures. In contrast to the first component of timeliness, the speed of utilisation could not be assessed for several instruments: contingent disaster loans and grants from the World Bank and ADB, World Bank-issued cat bonds, and three of the four regional risk pools. This is because each of these instruments is provided in the form of budget support, thereby giving governments complete discretion in the use of funds. Thus governments do not have explicit time frames within which this financing should be used. In contrast, IDB and ARC have explicit targets and robust policies and systems in place to track how and when governments use the financing received.

Contingent disaster loans and grants

IDB closely monitors CCF loan implementation progress given it is an investment loan. The proceeds of the CCF from IDB can only be used to cover expenditures incurred from the day on which the eligible event began up 180 calendar days later (extendable at IDB's discretion for an additional 90 days, for a total of 270 days). Moreover, unlike its regular investment loans, the CCF facilitates fast execution after an eligible event by allowing a government to use its own procurement rules and regulations. The borrower can obtain the requested amount as a loan advance or to reimburse payments the borrower makes with its own resources from the start of the date of the eligible event. IDB also has strong processes in place to verify the eligibility of expenditure, such as independent audits, as well as working closely with government officials to identify and prioritise expenditures that meet the contractual terms (IDB 2024c). IDB is therefore rated as 'good' with respect to timely utilisation of disbursements from the CCF.

In contrast, there is insufficient information to rate the World Bank and ADB contingent loans and grants as they are provided as budget support.

Climate resilient debt clauses (in MDB loans)

There is no explicit time frame relating to how countries use the fiscal space freed by climate resilient debt clauses on loans from IDB and the World Bank.

Catastrophe bonds (via MDBs)

There is no explicit time frame relating to how countries use cat bond payouts which are essentially provided as budget support.

Sovereign insurance (via regional risk pools)

Of the four regional risk pools, only ARC currently provides publicly available information on the timeliness of the utilisation of its payouts. This information is available via the independent FCDO-OPM evaluation, as well as publicly available payout process evaluations. CCRIF and PCRIC require countries to self-report on the use of the payouts within six months of the payout. However, these are not always received within six months (CCRIF 2022b) nor are the details independently verified. Instead, a high-level summary of the use of payouts reported by governments is published for each country in the annual reports, with no details provided on the timing of the usage of payouts. Meanwhile, the utilisation report relating to SEADRIF's first payout is in the process of being finalised and thus is not yet publicly available.

ARC has two targets relating to the use of payouts on the government side: (i) 120 days between ARC making the payout and the start of the implementation of the response; and (ii) 180 days to completion of the implementation of the response. The successive independent evaluations of ARC find that while ARC financing is typically early compared with other financing, payouts do not systematically result in faster assistance. Assistance is typically provided to households as cash, food, livestock food subsidies, and/or nutritional support.

The majority of ARC payouts do not meet its targets of reaching beneficiaries within 120 days of payouts (apart from Replica payouts) and of completing implementation of the response within 180 days 'due to challenges with government public financial management systems, targeting, and bureaucracy' (OPM 2022). For example, in Malawi, distributions of cash assistance in January and February 2023 occurred 210 days after the payout notification; additional expected maize support had not been received by December 2023 (Charlot and Mwamlima 2024). In other cases, the response started more than three months after the payout. ARC is therefore scored as 'poor' against this

sub-criterion. At the same time, four of the five payouts that missed the 120-day key performance indicator in the second evaluation (OPM 2022) were made during the covid-19 pandemic in 2020, which presented a difficult environment for implementation. The results of the ongoing OPM impact assessment, which is expected to be published in 2025, will provide further insight into the timeliness of governments' utilisation of ARC's payouts.

Table 9: Timeliness of utilisation of PAF by governments

Instrument/provider	Timeliness of utilisation
Contingent disaster loans/grants	
ADB (CDF)	●
IDB (CCF)	●
World Bank (CAT DDO)	●
Climate resilient debt clauses	
IDB	●
World Bank	●
Cat bonds	
World Bank	●
Sovereign insurance	
ARC	●
CCRIF	●
PCRIC	●
SEADRIF	●

Legend: green = good; amber = fair; red = poor; grey = not rated due to insufficient information.

Note: the criterion is only rated for instruments with an explicit time frame. ARC's 'poor score' is partly due to implementation challenges experienced during the covid-19 pandemic.

Source: Centre for Disaster Protection.

5.5. Predictability

SUMMARY

All PAF instruments are susceptible to unmet payout expectations or 'basis risk', which is the more technical term. This may be due to lack of understanding of the instrument itself, which can be exacerbated by the technical complexity of the pre-defined conditions to trigger the disbursements or payout. It is important to recognise that while certain providers have tended to use certain types of triggers, particular instruments do not require specific types of triggers and thus there is scope for triggers of all instruments to evolve as lessons are learnt, preferences change and technology improves.

Underlying triggers vary in technical complexity, with soft triggers tending to be the least complex while parametric triggers are the most complex. The latter are also susceptible to basis risk whereby the parametric index fails to accurately reflect the experience on the ground.

Recognising this potential weakness, the providers of parametric-based instruments such as IDB's CCF (Modality I), climate resilient debt clauses, World Bank-issued cat bonds and sovereign insurance have all explicitly taken steps to manage basis risk. These include allowing a level of flexibility in payout decisions, or including secondary triggers and pre-agreed fail-safes. It is beyond the scope of this paper to assess the effectiveness of these measures in reducing basis risk.

For all instruments there is insufficient publicly available information about the trigger and the analysis that supported trigger design (e.g. analysis of historical as-if payouts based on past events) to enable external analysis of basis risk in this report. Countries and development partners should make more detailed information on trigger structures and analysis of basis risk publicly available to facilitate learning and public scrutiny.

Finally, the three MDBs' contingent disaster grants and loans as well as ARC policies require additional conditions to be met for a disbursement or payout to be made even after the pre-defined trigger is met. There is no publicly available information to suggest that governments perceive these conditions as onerous or that these additional requirements have blocked any disbursements/payouts.

Contingent disaster loans or grants

While predictability and basis risk are largely a concern for parametric solutions, MDB contingent loan or grant instruments that are triggered on the basis of a declaration of emergency are not completely immune. Instances of positive basis risk can arise in situations where a country declares an emergency in response to a disaster event that does not severely impact a country's public finances or population. Such instances are rare, however, as governments are well aware of the potentially disruptive impact of such declarations, particularly on the economy. Moreover, MDBs manage potential instances of positive basis risk involving declarations of states of emergency through dialogue with governments in the immediate wake of events. A possible exception is an early World Bank development policy loan (DPL), the first Cat DDO for the Government of the Philippines, which was triggered for a relatively small-scale disaster in 2011 despite being intended to cover more severe events (see Box 10). The World Bank reports that such issues have largely been resolved 'through World Bank dialogue with the client, greater familiarity with the instrument, and World Bank analytics that help the government optimise the timing of drawdowns' (IEG 2022).

Box 10: Potential positive basis risk for the Philippines Disaster Risk Management Development Loan with a Catastrophe Deferred Drawdown Option

The World Bank approved the USD500 million Philippines Disaster Risk Management Development Loan with a Cat DDO in September 2011. It was the first of a series of World Bank Cat DDOs for the country, with the Philippines currently on its fourth Cat DDO. Its objective was to enhance the capacity of the government to manage the impacts of disasters.

The project was rated as satisfactory in a subsequent project performance assessment report (PPAR) undertaken by the World Bank's Independent Evaluation Group. However, some of the World Bank staff interviewed for the evaluation suggested that a 'relatively minor disaster by Philippine standards would not warrant drawing down the entire USD500 million of the CAT DDO' (IEG 2017b). The PPAR noted that this view was consistent with the programme document, which indicated that 'the government was advised that small-scale natural disasters are expected to be covered by the government's own resources and reserve funds, while this instrument may cover less frequent, more severe disasters' (World Bank, 2011). However, the government viewed the Cat DDO as more general budget support.

The PPAR identified contributing factors underlying the full drawdown in December 2011, including the occurrence of the event very near the end of the country's fiscal year on 31 December, which, without the drawdown of the Cat DDO would have required a special government session to determine how to meet the financing requirement. Additional factors include initially large estimated needs; political pressure to show solidarity with the victims, located in a particularly poor area of the country; lack of time on the part of responsible agencies to process support from other development partners; and improved access to capital markets since the Cat DDO was committed, leading the government to believe that it could afford not to keep the Cat DDO funding available for future disasters.

Among the MDBs' contingent disaster loans, Modality I of IDB's CCF is the most susceptible to basis risk given its use of a parametric trigger, whereas the World Bank and ADB rely on a soft trigger. IDB, however, has made a concerted effort to minimise basis risk. First, it limits Modality I to hazards for which reliable parameters are available, introducing Modality II in 2019 to deal with hazards for which parametric triggers are not readily available.

Second, the CCF parametric triggers calculate the correlation between the magnitude of disaster and the population affected by it, and have evolved over time to become more reliable in two ways: (i) applying higher-quality public information; and (ii) adjusting the event eligibility verification methodology (IDB 2021). With respect to tropical cyclones, initially only the passage of the central trajectory of a hurricane over areas (boxes) of high population density produced by the same country was analysed, which generated a basis risk problem. To mitigate this problem, IDB added more precise information to the analysis such as US LandScan population distribution data. With respect to floods not associated with tropical cyclones, progress has been made in developing alternative triggers (not only based on precipitation) and more precise ones such as high water marks (IDB 2021).

Third, detailed information on triggers and calculation procedures used for each country is publicly available. Operating regulations for each CCF loan contain the relevant triggers and are published online for almost all CCF operations (IDB 2023c). However, this information is insufficient to enable external analysis of basis risk and does not include details on historical as-if payouts, which may have supported the trigger design exercise.

Additional factors can undermine each of the MDBs' ability to provide assured funding after a disaster. Although rare in practice, it should be noted that access to contingent disaster grants and loans from all three MDBs can be withdrawn if a country's DRM

programme or equivalent is not on track (discussed in more detail in Section 5.6). All three MDBs require ongoing satisfactory progress in the linked DRM programmes. This progress is largely within the control of government but not directly within the control of ministries of finance, which are often the executing agency for these loans, since several commonly included actions, such as reforming national disaster law or strengthening building codes fall within the remit of other line ministries. MDBs have managed this risk in two ways. First, they have provided technical assistance and parallel loans and grants that facilitate progress with the DRM programme. Second, the banks periodically monitor the programme, including via annual missions, to verify compliance with the agreed indicators set out in a results matrix. There has not been an example of a country not being able to draw down its contingent loan from an MDB after declaring an emergency because of lack of progress with its reform programme. However, interviewees and evaluations noted that sometimes the milestones included in these reform programmes are low ambition or low effort and thus relatively easy to meet (discussed further in Section 5.6)

Finally, the World Bank and ADB require the existence of an adequate macroeconomic policy framework as a requirement in securing and renewing their respective contingent disaster financing instruments, but do not require further updates on macroeconomic conditions over the life of the instrument. This eliminates a potential obstacle to accessing the financing after a devastating disaster that severely weakens the economy and could thereby lead to a weak macroeconomic assessment.[39]

Climate resilient debt clauses (in MDB loans)

Despite only one country triggering its CRDCs in its World Bank loans and none from the IDB, CRDCs are assessed under this criterion as concerns about basis risk have explicitly affected the design of triggers in several notable ways.

First, IDB and the World Bank have sought to minimise the risk of unmet payout expectations for CRDCs by limiting themselves to perils for which reliable parametric triggers are available, such as earthquakes and tropical cyclones. The World Bank has explicitly noted that it would consider expanding CRDCs to other types of natural hazard such as floods and droughts 'as reliable parametric triggers become available' (World Bank 2023a). Second, the World Bank has also designed a secondary trigger related to its Global Rapid Post-Disaster Damage Estimation (GRADE) approach. It is possible that IDB has not opted for a secondary trigger given it is leveraging existing CCF parametric triggers and tailoring them to the CRDCs. Thus, after a track record of more than 15 years, IDB and borrower member countries are likely to have a reasonable degree of confidence in the underlying models and process.

In terms of additional requirements, both IDB and the World Bank give countries complete discretion in how they use the liquidity the temporary debt deferral creates. There are therefore no additional planning or reporting requirements associated with CRDCs from IDB or the World Bank that could potentially impact predictability.

Catastrophe bonds via multilateral development banks

A government generally does not have to meet any additional conditions to receive the payout from a cat bond following confirmation of an eligible event. Moreover, sovereign cat bonds issued by the World Bank primarily cover tropical cyclone and earthquake risks, for which reliable parametric triggers are more readily available. Other hazards, such as pandemics, are more challenging to capture accurately using parametric triggers as highlighted by the experience of the World Bank's PEF (Box 11). In principle, cat bonds could be developed to cover other more complex hazards, but would require more development work to issue than for simpler cat-in-grid-based tropical cyclone and earthquake issuances.

In terms of potential basis risk events for World Bank-issuances to date, there were two instances in 2022. The Government of the Philippines sponsored a World Bank-issued cat bond for tropical cyclones in 2019 and issued two notices to the calculation agent in 2022 – for the rains accompanying Tropical Storm Megi (Agaton) in April 2022 and for Super Typhoon Noru (Karding), which struck the country in September 2022. Following a verification process of 4–5 months, the cat bond was not triggered in either case (Artemis 2024b).

39 This was one of the lessons from IDB's CCL, which no country ever took up. See footnote 24.

Box 11: Challenges with the triggers of the World Bank's Pandemic Emergency Facility

Following the 2014–16 West Africa Ebola epidemic, the World Bank launched the PEF in 2017. It was the first attempt to use insurance to pay for pandemic risk on behalf of the world's poorest countries. The insurance component included USD320 million in parametric cat bonds that were issued through the IBRD Capital at Risk Notes programme and were the only global cat bonds designed specifically to respond to severe epidemic and pandemic events (World Bank 2017a).

Despite the cat bond being triggered in April 2020 in response to the covid-19 pandemic, various aspects of the facility were heavily criticised in the media, particularly its speed and complexity (Hodgson 2020). These issues stemmed in part from the PEF's 'growth rate' payout condition, one of seven criteria that collectively defined the parametric trigger for the insurance window (Meenan 2020). This condition required an acceleration of newly reported cases over a 12-week period, which, in retrospect, was too long relative to the speed of the spread of the covid-19 outbreak. By the time PEF paid out, the virus had already taken hold in most countries (Clarke 2020).

The World Bank did not renew the PEF insurance window after the pandemic bonds and swaps matured on 15 July 2020; the PEF as a whole closed in 2021. It is a useful lesson in how getting triggers right requires more than state-of-the art modelling and is critical for the credibility of an instrument as an effective PAF tool.

While it is unclear whether these were basis risk events related to poor trigger design in the case of the Philippines, the occurrence of severe events that were not severe enough to breach the trigger threshold (combined with delays in the verification process as described in Section 5.4) could potentially undermine a government's trust in a PAF instrument as reliable. Extended periods of uncertainty regarding potential payouts impact government response and recovery efforts. They involve large amounts of finance that a government may or may not receive.

Recognising these challenges, some recent cat bond issuances include new features that seek to address some of the operational challenges that have led to delays in payout decisions. The index design process has also tended to address basis risk structurally, rather than using discretionary mechanisms during the payout calculation process (unlike risk pools, as described below). Cat bonds typically incorporate fail-safe or secondary reporting and calculation processes, which are outlined in the offering materials. These come into effect if there are reporting issues with the primary reporting agent that would affect the payout calculation process; for example, if an upstream data provider is 'down for maintenance'.

Sovereign insurance (via regional risk pools)

CCRIF, ARC and PCRAFI, the predecessor to PCRIC, have all experienced situations of unmet payout expectations during their years of operation, primarily reflecting issues with underlying models, the complexity of factors determining levels of loss, the need to take account of specific local context and the quality of inputted data. Problems in 2021 with a rainfall dataset used for ARC's drought models led to a basis risk incident in West Africa, which in turn resulted in late payouts to three countries (OPM 2022). CCRIF's impact model underestimated the impact of flooding in Jamaica in May 2017 in part because it did not include agricultural loss, and thus was not triggered despite the flooding causing significant damage (Hillier 2017). The Solomon Islands purchased tropical cyclone and earthquake coverage during the PCRAFI pilot programme, but did not renew the policies after two non-payout events (World Bank 2023c). All the risk pools have adopted corrective measures, recognising

the negative impact unmet payout expectations have on their credibility as a reliable source of PAF.

A priority is improving the models underlying the parametric triggers, which ARC, CCRIF and PCRIC all do to varying degrees. CCRIF has continuously updated its catastrophe risk models for tropical cyclones, earthquakes and excess rainfall throughout the years, with its policies for the 2023/24 policy year based on enhanced models (CCRIF 2023a, 2023b). Moreover, unlike the other risk pools, CCRIF owns its models outright. This allows the facility to update and tailor them more easily than by leasing the models from outside vendors. ARC's approach to minimising basis risk (real and perceived) is continued customisation of Africa RiskView[40], as well as ongoing communication and sensitisation with countries on model limitations and basis risk (ARC 2020). ARC has also added a basis risk explainer into its policy documents to manage payout expectations. However, gaps in data, the complexity of the drought model, and limitations in using satellite-based systems to assess rainfall deficits and generate early warning of food insecurity hinder effective customisation of the ARC model. As a result, the model is considered to be a poor reflection of reality in some countries whereas it is perceived to work reasonably well in others. PCRIC is in the process of updating its models from a 'modelled loss to buildings' approach to a 'people-impacted' approach (PCRIC 2024a). The new approach will simplify the policies PCRIC offers to build the understanding and confidence of PCRIC's policyholders. SEADRIF has also recognised the need to improve its model; following its first placement, in collaboration with the World Bank it has actively taken steps to gather feedback and understand what enhancements could be made to the flood tool (SEADRIF 2022).

CCRIF and SEADRIF have also created rules-based processes that may provide resources when policies fail to be triggered. CCRIF added an indemnity component –aggregated deductible cover (ADC) – to its tropical cyclone and earthquake policies to help address issues of basis risk. The ADC was introduced in 2017, enabling payouts in cases where modelled losses do not meet the agreed threshold, but where losses are nevertheless significant (Plichta and Poole 2023). The maximum ADC payment a country can receive after an event is the net premium paid for the tropical cyclone or earthquake policy by that country. Haiti has received the largest ADC payout to date, totalling USD40 million following a 7.2 magnitude earthquake in 2021. The newest regional risk pool, SEADRIF's first – and, thus far, only – insurance product also includes a soft component to help mitigate potential issues of basis risk, as well as to provide coverage for smaller-scale flood events below the threshold for parametric trigger payouts and some coverage for other, unmodelled types of peril. Meanwhile ARC has ultimately made several non-contractual payments to individual countries to address instances of basis risk – for example, Malawi in 2017 and Mauritania in 2018. Importantly, this can be a lengthy process and has sometimes involved ARC negotiating with re-insurers so they contribute to payments following a data failure.

In terms of additional requirements after a payout is triggered, ARC is the only risk pool that requires countries to develop a final implementation plan (FIP) after a payout is confirmed (ARC, n.d.). This plan operationalises the contingency plan a country has to develop before purchasing an ARC policy. The objective of FIPs is to improve planning and increase the likelihood that countries are able to rapidly implement drought and cyclone responses after receiving payouts. The 2022 independent evaluation of ARC does not flag up these plans as an onerous requirement for governments to meet, but instead indicates there is political pressure for the review committee to approve plans and as a result 'issues with the FIPs which perhaps should be viewed as critical do not prevent approval' (OPM 2022).

40 Africa RiskView is a collection of software tools used by ARC to estimate the number of people affected by disaster events and the associated response costs. The Africa RiskView drought package translates satellite-based rainfall information into near real-time impacts of drought on agricultural production using existing operational early warning models.

5.6. Evidence of resilience building

SUMMARY

Some form of contribution to enhanced resilience (beyond fiscal preparedness) is well within the reach of PAF instruments, at least if the instrument is designed well and implemented at scale. The MDBs' contingent disaster loans and grants, and to a lesser extent the ARC's sovereign insurance policies, seek to build a country's broader resilience to shocks. The remaining instruments – CRDCs, cat bonds and insurance from other risk pools – primarily focus on building fiscal resilience. However, even when a primary objective, limited evidence is available on the contribution of the instruments from the MDBs and ARC to reduced vulnerability and exposure to natural hazards through risk reduction, preparedness, building back better and risk understanding.

The contingent disaster loans and grants from each MDB are accompanied by mandatory programmes of policy actions that seek to generally improve a country's DRM capacities. The substance of these actions largely coincides with the four areas of resilience building assessed in this report. Moreover, policy actions tend to bring together different parts of the government to prioritise preparedness in a way that often has not happened before (IEG 2022; IDB 2023b). However, MDBs are generally unable to demonstrate the impact of programme measures on outcomes such as reduced vulnerability and exposure, with indicators largely defining progress in terms of outputs and processes, rather than outcomes and changes in behaviour.

Among the risk pools, only ARC currently has a dedicated programme (via ARC Agency) to build members' capacity in risk modelling and contingency planning requirements relating to the use of payouts, which is a prerequisite for securing insurance coverage and receiving a payout. In comparison, the other risk pools' resilience-building efforts that accompany their insurance products appear limited to improving member countries' risk understanding and knowledge by providing training to country officials in the models underlying their products, as well as making risk information available in the public domain. Moreover, there is little to no evidence of any of the four risk pools using their instruments to directly incentivise risk reduction or building back better.

Cat bonds issued under the World Bank's Capital at Risk Notes programme are not designed to contribute to resilience building beyond providing liquidity quickly and thus perform poorly in each of the specific aspects of resilience covered under this criterion. IDB and World Bank CRDCs are not rated due to insufficient information.

Contingent disaster loans and grants

During the 2000s, DRM policies at ADB, IDB and the World Bank were updated to progressively shift the focus from responding to disasters to creating resilience (Puerta et al. 2023), in line with the broader shift in global approach. This shift is reflected in the design of their contingent disaster loans and grants, which generally seek to improve countries' DRM via a mandatory DRM programme or equivalent.[41] Ultimately, these programmes are a notable strength of contingent disaster loans and grants from the three MDBs, with countries often receiving accompanying technical assistance to support their achievement. Assessing the adequacy and quality of this technical assistance, however, is beyond the scope of this assessment.

41 ADB CDF loans and grants are linked to a series of prior and monitorable DRM actions, although these are not collectively labelled as DRM programmes like those of the World Bank and IDB.

While the details of these DRM programmes may vary across countries, they typically include a range of actions that largely overlap with the four areas of resilience building assessed under this criterion. For example, the policy actions of some MDBs' contingent operations include legislative and regulatory reforms relating to building standards and codes or incorporating disaster risk and climate change analysis in the formulation of public investment projects. These actions can potentially support building back better. A policy matrix identifies the activities necessary for the country to achieve progress in each of the areas and is monitored through indicators that are tracked over the implementation period. Another key feature is that the contractual terms of these contingent disaster loans and grants explicitly state if progress is unsatisfactory during the period of availability of the loan or grant, it could result in the suspension of eligibility to make disbursements. No information is publicly available on contingent disaster loan or grant operations suspended or cancelled for this reason, with one interviewee indicating that they were aware of only one case of a contingent disaster loan being suspended due to a country's lack of progress with its DRM programme. However, this does not necessarily mean all programmes have been on track, given that suspension or cancellation of a loan is a politically difficult decision for an MDB to make. Moreover, especially in earlier programmes for Colombia and the Philippines, there have been examples of governments opting for modest targets and results indicators to ensure they would not lose access to the contingent line of credit due to missing programme targets (IEG 2017a, 2017b). Modest indicators are also deliberately chosen for some small states and lower-income countries in recognition of their limited financial and technical capacity to implement policy actions (World Bank 2024b).

However, related evidence on their achievements is limited. This is not to say that the policy actions have not been successful, but rather that MDBs lack robust evidence to demonstrate success (or lack thereof). A key contributing factor is that these programmes have largely focused on measuring outputs or processes rather than the effectiveness of these outputs or processes in contributing to specific outcomes. An evaluation of the World Bank's policy-based lending instruments with a disaster risk reduction component between 2010 and 2020, including some Cat DDOs,[42] reached a similar conclusion (IEG 2022). It found that although development policy financing projects with DRR policy actions had mostly achieved their disaster-related indicators, only 39% captured downstream impacts or changes in disaster-related behaviours in the real economy, such as tracking implementation of policy measures at subnational level, operationalisation of new institutions or changes in behaviour. The remaining 61% captured upstream measures, such as the issuance of regulations or approval of frameworks, which do not instil confidence that a policy change would be achieved. Similarly, the DRM reforms for the ADB Pacific Disaster Resilience Program (Phases 1 and 2) measured the number of DRM policy reforms; mainstreaming of DRM into national, local or sector plans and policies; and the completion of activities to increase preparedness capacities for response (ADB 2023b). These output- and process-oriented indicators are typically chosen because linking policy actions and their associated financing to desired outcomes entails several challenges:

i. Attribution – the desired final outcome may be influenced by many other factors.

ii. Data – reliable and timely data is often not available in a cost-effective manner.

iii. Time – outcomes and impacts may be realised only with a considerable lag. ADB's guidelines state that 'impacts are long-term in nature and are expected to occur sometime after project closing' (ADB 2020a). For projects with non-physical outputs, outcome indicator target dates should be set to ensure that achievement can be assessed in the project completion report (ADB 2020a).

Regardless of these challenges, there is scope for DRM programmes to spell out a practical framework that links policy reforms to meaningful resilience-building outcomes, building on the experience of the 39% of DRR-related World Bank policy-based lending instruments that successfully captured downstream measures between 2010 and 2020. There is also evidence of recent World Bank Cat DDOs improving in this regard. For example, the 'Malawi Disaster Risk Management Development Policy Financing with Cat DDO' approved in 2019 measures the percentage of new educational facilities constructed or rehabilitated in compliance with the technical hazard-resilient criteria the government adopted. It found that all education facilities built or rehabilitated during the project

42 The sample included 33 development policy operation (DPO) self-evaluations, including some for DPOs with Cat DDOs.

period followed Safer Schools Construction Guidelines, and that these facilities withstood cyclones in 2022, which severely damaged educational infrastructure in the same locations that did not comply with the guidelines (IEG 2023b). It also tracked the extent to which social protection through the Unified Beneficiary Registry was used to support those affected by disasters. Better indicators to measure resilience building are therefore within the realm of possibility.

A limited programmatic approach may also have hindered the resilience impact of contingent disaster loans and grants from the MDBs. A programmatic PBL or investment loan consists of a series of uncommitted stand-alone PBLs or investment loans that aim to support reforms that mature over a longer period and, consequently, whose conditions could not all be defined in a single policy matrix at the outset. Although the contingent financing instruments of the three MDBs can be renewed 2–3 times, most of these loans have been stand-alone, creating challenges in promoting medium-term crisis preparedness and prevention. For example, some countries in the Pacific have secured a quick succession of ADB CDF grants and loans due to a series of major disasters. Following each full drawdown, the countries have been keen to reinstate contingent coverage through new CDF programmes, but this has left insufficient time to achieve DRM actions under existing ones. In the case of the Pacific Disaster Resilience Program, ADB has used post-programme partnership frameworks to initiate a programmatic perspective that subsequent phases of the programme could build on. The positive effects of the programmatic engagement can be seen in Tonga, which has participated in the first four phases. Institutional arrangements and reform actions have moved beyond laying foundations to developing and implementing more detailed technical frameworks (ADB 2023b). Ultimately, PAF instruments are well suited to programmatic approaches in view of the need for continuing long-term cover.

Contingent disaster loans and grants are rated as 'fair' under four areas of resilience building. Although MDBs' contingent disaster loans and grants seek to impact countries' broader physical, social and economic resilience to shocks via policy actions, the evidence of impact is currently limited.

Climate resilient debt clauses (in MDB loans)

CRDCs are not rated due to insufficient information. Theoretically, CRDCs in IDB loans may have an impact on resilience building given their requirement for a country to have an active CCF. In contrast, it is currently unclear to what extent World Bank CRDCs are being rolled out with a broader focus on resilience building beyond fiscal preparedness. Unlike IDB, there is no explicit prerequisite linking the World Bank's CRDCs to its contingent disaster loans or grants.

Catastrophe bonds (via MDBs)

There is no evidence in publicly available information that cat bonds have directly contributed to risk reduction, preparedness, building back better, or risk understanding and knowledge. Cat bonds are largely market transactions even when intermediated by a development bank. In the vast majority of cases, the sponsoring government has paid the premiums and transaction costs. Thus, a reform programme tied explicitly to a cat bond issuance is likely to be seen as inappropriate. Moreover, four[43] of the six countries with World Bank-issued cat bonds also have a Cat DDO and/or an IDB CCF, and have thus benefitted from MDB-supported DRM-related programmes via these other instruments.

Finally, it is worth noting that models underlying cat bonds are based on proprietary risk models and draw on hazard event data from internationally recognised agencies. Use of third-party modelling is a transaction requirement. In addition, while the bond prospectus potentially contains useful information on risk analytics and trigger design to build risk knowledge and understanding, it is typically not publicly available as this is not standard market practice.[44] Cat bonds are therefore rated as 'poor' in each of the areas under this criterion.

Sovereign insurance (via regional risk pools)

In comparing the resilience-building efforts associated with instruments of the MDBs and regional risk pools, it is important to recognise that the regional risk pools are much smaller than MDBs and do not have the budget or capacity to provide significant support in each of these

43 These include Colombia, Peru and the Philippines from the World Bank, and Jamaica and Peru from IDB.
44 There are two notable exceptions with the prospectus for two World Bank-issued cat bonds publicly available online: the Philippines cat bond and the PEF cat bond.

areas on their own. There are also significant differences between the pools, with ARC's technical assistance programme delivered through ARC Agency, which is the capacity-building arm of the ARC Group. There is currently no equivalent in the other three risk pools.

Risk reduction

None of the risk pool instruments currently appears to support activities relating to risk reduction; they are therefore rated as 'poor'. Given the pools' use of risk-based pricing (in contrast to the MDBs' contingent disaster loans), a country's efforts to reduce risks could theoretically lead to lower insurance premiums. However, the parametric insurance each of the risk pools currently offers is priced on a combination of the stochastic output of a cat model and the historical experience of events that would have triggered the policy. This is different from indemnity contracts, where pricing is annually reviewed to take account of recent loss experience and risk reduction measures. Regular updating of underlying cat models for risk pool products to capture increased resilience is likely to be time-consuming and expensive. Moreover, the current level of risk pool coverage as well as the size of expected payouts (often a modest fraction of total post-disaster need) mean that a reduction in premiums is unlikely to provide a powerful financial incentive on its own for governments to undertake actions to reduce disaster risks.

Preparedness

ARC is the only risk pool currently seeking to directly strengthen the DRM capabilities of government through support for contingency planning. Importantly, ARC's contingency plans are largely limited to improving preparedness in relation to how the ARC payout will be implemented and therefore differ from the broader preparedness activities that MDBs' policy actions tend to support in the institutional, administrative, regulatory and procedural space; for example, approval of the national emergencies legislation that may enhance the effectiveness of all PAF and ex-post instruments.

To secure insurance coverage from ARC, a country must prepare a contingency plan to guide the use of ARC insurance payouts, with support provided mainly through technical assistance from ARC Agency. The benefit of these plans lies not just in the assurance they provide by ensuring processes are in place to receive ARC payouts and distribute them to the pre-identified responsible implementing entities, but in strengthening the capabilities of government officials to proactively allocate resources for disaster response more generally. A committee evaluates the plans to assess whether they meet ARC's requirements in two areas. First, whether the activities being proposed are an appropriate use of ARC funds; and second, whether arrangements are in place for activities to be implemented, monitored and evaluated.

The ARC independent evaluation finds that ARC's products have been influential in increasing the number of contingency plans for drought across the continent and enabling governments to take the lead in planning and implementing measures to facilitate implementation of the plans (OPM 2022). However, the delays in payouts discussed in Section 5.4, as well as delays in the implementation of responses, can be attributed to factors that should be addressed in contingency plans, particularly bottlenecks arising from weaknesses in public financial management systems, targeting and bureaucracy (OPM 2022). For example, although the Government of Senegal received its ARC payouts in a timely manner, there were delays in setting up a special bank account to manage the ARC funds, which led to delays in implementing the rest of the activities. Moreover, ARC's capacity-building efforts have not moved from individual level to institutional level and have been hindered by high levels of turnover at both political and technical levels within recipient governments (OPM 2022). Improving the process and quality of contingency plans is critical for ARC payouts to systematically result in providing assistance to targeted households faster. ARC is therefore rated as 'fair' for preparedness.

Like ARC, SEADRIF also requires the preparation of contingency plans to secure coverage under its only existing product. However, the focus of these plans is largely on identifying eligible items of expenditure (SEADRIF 2024)[45] and thus less ambitious in intent and scope than plans developed by ARC. There is currently no available evidence on the impact of this plan on building resilience in Lao PDR; as a result, SEADRIF is not rated due to insufficient information.

45 The Government of Lao PDR committed to use its payout in accordance with a pre-approved contingency plan, which includes goods and services that support post-disaster emergency relief, response and recovery efforts (SEADRIF 2024).

Neither CCRIF nor PCRIC currently require their member countries to prepare contingency plans. Their annual reports and strategic plans also do not provide any examples of their instruments strengthening preparedness beyond the quick post-disaster injection of liquidity. However, PCRIC has indicated its intention to support countries in developing contingency plans and in a way that does not strain countries' capacity. In contrast, CCRIF is unlikely to introduce mandatory contingency plans across all its products since governments' discretion in how they use their payouts is a key feature of the CCRIF model. A potential key difference between CCRIF's approach and that of the other risk pools may be because CCRIF members tend to pay most of the insurance premiums themselves, whereas the other risk pools' members are increasingly dependent on premium support from donors (as discussed in Section 5.2). CCRIF and PCRIC are scored as 'poor' in preparedness beyond building financial resilience.

Risk knowledge and understanding

Most of the risk pools have attempted to directly strengthen client countries' understanding of risks by sharing risk models and risk data with government officials and other stakeholders, introducing some actors – and even some countries – to risk modelling for the first time, and providing new insights and data with wider application in strengthening DRM. CCRIF shares risk data with member countries through a web monitoring application (WeMAp) that monitors current hazard events as they occur, allowing users to see which areas are projected to be affected by tropical cyclones. ARC provides access to risk data through Africa RiskView, for drought, and Tropical Cyclone Explorer, for cyclones, as well as capacity-building workshops to help countries understand and customise risk models. PCRIC operates a live risk information platform, which allows users to view key risk metrics for earthquakes and tropical cyclones.[46] However, all three risk pools recognise there is significant room for improvement in how and what they share.

Both CCRIF and PCRIC are in the process of enhancing their risk-sharing platforms to facilitate better access to more granular data (CCRIF 2024; PCRIC 2024a). In the case of ARC, although several member countries use its models as inputs for national planning, lack of trust in the models and quality of risk information in some countries (as discussed in Section 5.5) is problematic (OPM 2022). More broadly, for all the risk pools, evidence is limited of governments or other key stakeholders using the models and underlying data to improve decision-making. Taking all these considerations into account, ARC, CCRIF and PCRIC are scored as 'fair' in this area.

Conversely, given SEADRIF has yet to articulate its offer in this regard, it is currently rated as 'poor'. This may be because SEADRIF is relatively new in this space and because its only current client, the Government of Lao PDR, is also benefiting from a World Bank DRM programme.[47] In addition to financing SEADRIF's premium, this programme seeks to train government staff in risk assessment and flood modelling, as well as providing hydro-meteorological data that is accessible on a centralised online data management platform (Floissac and Marie 2024). Consequently, the need for SEADRIF to develop a capacity-building programme may not be urgent or even necessary in this case.

This partnership between the World Bank and SEADRIF is not unique. There are several examples of MDBs collaborating with the regional risk pools, particularly in the area of capacity building and as a provider of premium financing. The partnership between the ARC and AfDB through the ADRiFi programme launched in 2019 is one such example (see Box 8). Through the programme, AfDB is working with ARC to support its member countries in developing climate risk profiles and DRF strategies. The ADRiFi programme is open to all AfDB regional member countries that are ARC member states and signatories to the ARC Establishment Treaty. The programme is currently supporting 16 African countries with technical assistance and capacity building (AfDB 2024). No evidence was found of regional risk pools explicitly seeking to support countries to build back better.

46 The Risk View Platform hosts original risk information from the original AIR risk model prepared for the Pacific Catastrophe Risk Insurance Company's predecessor, the Pacific Catastrophe Risk Assessment and Financing Initiative, alongside exposure information most recently updated in 2022.
47 Southeast Asia Disaster Risk Management projects in Lao PDR (P160930).

Table 10: Resilience building of PAF for governments

Instrument/provider	Risk reduction	Preparedness	Build back better	Risk understanding and knowledge
Contingent disaster loans/grants				
ADB (CDF)	🟠	🟠	🟠	🟠
IDB (CCF)	🟠	🟠	🟠	🟠
World Bank (CAT DDO)	🟠	🟠	🟠	🟠
Climate resilient debt clauses				
IDB	⚫	⚫	⚫	⚫
World Bank	⚫	⚫	⚫	⚫
Cat bonds				
World Bank	🔴	🔴	🔴	🔴
Sovereign insurance				
ARC	🔴	🟠	🔴	🟠
CCRIF	🔴	🔴	🔴	🟠
PCRIC	🔴	🔴	🔴	🟠
SEADRIF	🔴	⚫	🔴	🔴

Legend: green = good; amber = fair; red = poor; grey = not rated due to insufficient information.

Source: Centre for Disaster Protection

5.7. Evidence of development impact

SUMMARY

There is a focus in all PAF objectives on reducing governments' fiscal vulnerability to disasters. PAF instruments are, by definition, intended to ease fiscal pressures and the need for budget reallocations, providing rapid disbursement of additional resources and injecting confidence that recovery and reconstruction plans will be promptly delivered. Moreover, while their size may be small relative to the total financing needed after a disaster, they offer a valuable entry point for different actors, particularly MDBs, to engage in discussion with government on the fiscal risks disasters pose and precipitate further action to manage these risks.

All instruments are rated as 'good' for their contribution to fiscal stability with the exception of CRDCs and sovereign insurance from SEADRIF, which are both relatively new instruments and information on their development impact is insufficient.

In stark contrast, none of the instruments is rated as 'good' for its contribution to supporting poor and vulnerable groups. IDB's CCF and ARC's sovereign insurance score the highest with a 'fair' rating given there is some evidence of their disbursements and payouts explicitly being used to target poor and vulnerable groups after a disaster. Out of all the instruments in this report, ARC is the most ambitious in this regard in trying to get assistance to poor and vulnerable households in a timely manner to prevent negative coping strategies. However, based on independent evaluations, ARC's experience shows that having pre-agreed plans in place is insufficient to ensure government interventions are well targeted, and that payouts reach households in a timely manner to avoid negative coping strategies. On the other hand, partnerships with humanitarian organisations have been one of the most effective ways to ensure that PAF disbursements and payouts reach poor and vulnerable groups in a timely manner (based on available evidence from ARC and IDB's CCF).

The other instruments, however, are largely provided as general budget support; there is no substantive, independent evidence to support the frequent underlying assumption that poor and vulnerable groups directly or indirectly benefit from these instruments' payouts or accompanying policy conditions. While these instruments may have some benefit, including indirectly through strengthening systems and processes to ensure that assistance reaches affected populations as rapidly as possible, such benefits are not systematically monitored or evaluated in a robust manner. Hence, most instruments are rated as 'poor' in terms of evidence of protecting poor and vulnerable groups.

Contingent disaster loans or grants

Sub-criterion 1: fiscal stability

All three MDBS' contingent disaster loans and grants explicitly aim to build governments' fiscal resilience by enabling timely and more comprehensive disaster response to mitigate immediate adverse impacts and speed up recovery. To achieve this objective, MDBs ensure their own financing is disbursed quickly following a government's request (as discussed in Section 5.4) and also seek to support countries in building their fiscal resilience more broadly. The accompanying programme of policy actions often requires governments to adopt a risk layering approach to build their financial resilience to climate and disaster shocks. The approach involves supporting countries in developing and implementing a strategy that combines a mix of financial instruments tailored to each country's risk profile and financial needs.

The monitoring and evaluation frameworks for these programmes therefore often track how much aggregate

financial coverage a government has attained using a combination of PAF instruments, not only the MDB's own instrument. Based on publicly available project completion reports and evaluations, governments have generally met their targets for this indicator. For example, in the first two phases of the Pacific Disaster Resilience Program, all six countries succeeded in increasing their access to pre-disaster financing to achieve a target of at least 0.5% of GDP (ADB 2023b). While the ADB CDF alone led to the achievement of the outcome indicator in most countries, in the Solomon Islands, the target was achieved through a combination of CDF, disaster relief budget lines and a general contingency warrant. The World Bank Cat DDO for Malawi also achieved its target relating to the 'number of new ex-ante risk financing instruments established in alignment with the National Disaster Risk Financing Strategy' (IEG 2023b).

In addition, IDB systematically monitors effective financial coverage if an eligible event occurs (IDB 2023a; 2023b). To measure the extent to which the CCF and other PAF instruments cushion the impact of a severe disaster on a government's public finances, IDB measures the ratio between the amount of effective coverage and public expenses incurred during an emergency. For example, following the CCF disbursement to the Government of Nicaragua for Hurricane Eta and Hurricane Iota in 2020, IDB estimated that PAF accounted for about 75% of the extraordinary public expenses incurred for the immediate response to the emergency and the temporary rehabilitation of public infrastructure (IBD 2023b). They included disbursements from the CCF (USD35 million) and the contingent emergency response component (CERC) of a World Bank loan (USD11 million), as well as a payout from a CCRIF policy (USD30.6 million). A similar indicator is not systematically tracked in the project completion reports of the contingent disaster loans and grants of the World Bank and ADB. However, an evaluation of Columbia's first Cat DDO found that although the Cat DDO covered only an estimated 1% of emergency response, rehabilitation, and reconstruction, 'it financed the initial recovery efforts and helped to reduce the risk perception of the country in the aftermath of a major disaster, thus protecting the government's access to financial markets for reconstruction financing' (IEG 2017a).

MDBs have explicitly recognised the spin-off benefit of contingent disaster loans and grants, particularly when provided as budget support, in bringing ministries of finance into the disaster risk management arena, raising its profile – 'a powerful game changer' (IEG 2017a). Ministries of Finance or their equivalent tend to have huge convening power, the influence and leverage to allocate resources to disaster risk reduction, and the political influence to drive action (IEG 2022). These instruments have also given the MDBs themselves a seat at the table, enabling them to participate in the government's DRM discussions and to contribute their expertise at a strategic level.

Based on available evidence, particularly from project completion reports and evaluations, MDBs' contingent disaster loans and grants have contributed to strengthening the fiscal resilience of their client countries; all three MDBs are therefore rated as 'good' under this sub-criterion.

Sub-criterion 2: protecting poor and vulnerable groups

In contrast, MDBs' evaluations provide relatively little evidence of the impact of their instruments (via policy actions and disbursements) on the wellbeing of specific vulnerable groups following a disaster.

For all three MDBs, there is usually an explicit assumption in the theory of change that poor and vulnerable groups will indirectly benefit in two ways. First, it is often assumed that a government's access to quick liquidity following a disaster minimises disruptions to government budgets and provision of critical public services, thereby strengthening emergency relief and recovery measures, preventing vulnerable populations from falling deeper or back into poverty. Second, some of the policy actions, as in Kenya's and Malawi's Cat DDO (World Bank 2022c), seek to improve mechanisms that target vulnerable households such as adaptive social protection systems (although they do not explicitly require the Cat DDO disbursements to use these mechanisms).

However, generally there is insufficient evidence to assess the validity of these two assumptions in the MDBs' evaluations. As noted in the case of Kenya's Cat DDO, although the project completion report concluded that the operation 'had a positive poverty and social impact' (World Bank 2022g), the follow-up evaluation from the Independent Evaluation Group noted that 'no specific evidence was presented' and that 'a longer time

might be needed to observe impacts of the operation on social poverty aspects' (IEG 2023a). In contrast, the World Bank's evaluation of the Colombia DPL with Cat DDO found that the loan prompted improvements in the information system, organisational setup, and administrative procedures and processes to ensure that assistance reach the affected population as rapidly as possible (IEG 2017a). However, it also noted several weaknesses in the results framework and the logical chain linking inputs, outputs and outcomes.

In terms of evidence on the actual use of disbursements, the development impact is even less clear. Owing to the unearmarked nature of the ADB and World Bank instruments, even if one wanted to track this spending, by design it would not be possible to distinguish it from the overall budget expenditures. Instead, MDBs often use the instruments' policy actions to support governments in improving their budgeting systems to better identify and track disaster-related spending more broadly. ADB has also monitored how CDF disbursements are being pooled with other development partners' funds to finance response and recovery activities. For example, in Tonga, ADB notes that following Tropical Cyclone Gita, the CDF and funds from other development partners 'financed activities under clusters responsible for water, sanitation, and hygiene; emergency shelter; education; food security and livelihoods; safety and protection; and essential services' (ADB 2023). While the ADB report did not provide disaggregated information on the beneficiaries of this spending, these expenditures are typically associated with poor and vulnerable groups.

Additionally, despite being an investment loan, IDB's CCF does not seek to define beneficiaries ex-ante. This is due to the contingent nature of the loan and the fact each disaster 'manifests itself in a unique and unrepeatable way' (IDB 2023b). Moreover, the results matrix and indicators used in the CCF project completion reports do not monitor the impact of the CCF on specific groups or require disaggregated data on beneficiaries. However, IDB works closely with governments after an eligible event occurs to identify priority sectors that allow establishing a strategy to direct the resources destined to help the affected populations. Although not tracked in the results matrix of PCRs, Nicaragua's CCF disbursement in 2020 following Hurricane Eta and Hurricane Iota had a strong pro-poor focus. This in turn was largely because the hurricanes affected a region inhabited mostly by indigenous groups, which tend to be the most vulnerable and food insecure groups in the country (IDB 2023b). Consequently, 15% of the CCF disbursement was channelled through the World Food Programme (WFP) to ensure the availability of food and food security for the populations most affected by the hurricanes. IDB formed a similar partnership with WFP following Hurricane Julia in Nicaragua in 2022 with the hurricane exacerbating an already fragile situation in the indigenous and non-indigenous communities (project completion report in preparation). Thus, depending on the nature of the disaster and country context, there is evidence of CCF disbursements specifically targeting specific poor and vulnerable groups. Moreover, these achievements are tracked in the PCR (which is only completed for disbursed CCF loans), even if not as part of the results matrix.

IDB's CCF is rated as 'fair' for this sub-criterion, whereas the World Bank and ADB contingent disaster instruments are rated as 'poor', given the lack of evidence that their policy actions and payouts directly protect poor and vulnerable groups.

Climate resilient debt clauses (in MDB loans)

Sub-criterion 1: fiscal stability

Both IDB and the World Bank promote CRDCs as part of a larger risk layering approach to build the fiscal resilience of eligible countries. However, the impact of this instrument on a country's fiscal stability is not rated. While one country has triggered its CRDCs from the World Bank in 2024, no information is currently publicly available about this. It is also unclear how or if either IDB or the World Bank will monitor the impact of CRDCs on countries' fiscal resilience, including the impact on those countries' debt sustainability. A review of the World Bank's CRDCs will take place at the end of 2025 and may provide further insight (World Bank 2024c).

Sub-criterion 2: protecting poor and vulnerable groups

The above challenges also apply to rating this second sub-criterion, which hence is not rated. However, both the World Bank and IDB give countries full discretion over how they use the freed fiscal space created by the debt service deferral; as they are currently designed, CRDCs do not explicitly require that the freed fiscal space is used to protect specific poor and vulnerable groups.

Catastrophe bonds via MDBs

Sub-criterion 1: fiscal stability

The World Bank currently does not seek to measure the development impact of sovereign cat bonds provided through the IBRD Capital at Risk Notes programme. There is also no evaluation of the development impact of the now closed PEF and its related cat bond issuances and payouts.

In the exceptional case of the grant financing provided to cover the first Jamaica cat bond premium payments, the project development objective narrowly focused on expanding Jamaica's financial protection against losses arising from severe tropical cyclones-wind, with the related project development objective indicator set as 'Increased insurance coverage' and the intermediate results indicator as 'CAT bond placed in the market' (World Bank 2021). Both were achieved.

It is also worth noting the sponsors of recent World-Bank cat bond issuances – for example, Chile and Jamaica –position their cat bonds as a part of risk layering framework that demonstrates their commitment to fiscal responsibility (World Bank 2023d). Furthermore, Fitch Ratings, which incorporates 'natural disaster risk and mitigation' in its ratings, also issued a special report on how the 2021 cat transaction significantly strengthened the Government of Jamaica's 'natural disaster risk mitigation strategy' (Fitch Ratings, 2021). Cat bonds are therefore rated as 'good' for fiscal stability.

Sub-criterion 2: protecting poor and vulnerable groups

Cat bonds provide budget support to governments and thus payouts are unlikely to explicitly target specific poor and vulnerable groups. Moreover, no publicly available evidence shows that this is one of the development objectives of cat bond issuances to date, even for Jamaica's 2021 issuance, which was completely subsidised by development partners. As noted above, the World Bank's results framework for the Jamaica issuance only measured the completion of the cat bond transaction. Cat bonds are therefore rated as 'poor' under this sub-criterion given the lack of evidence.

Sovereign insurance (via regional risk pools)

Sub-criterion 1: fiscal stability

Sovereign insurance provides immediate liquidity to countries after a disaster, serving as bridge financing while additional funds such as bilateral aid and MDB reconstruction loans are being mobilised; it is not intended to cover all losses that a country may incur. Despite being small relative to needs, payouts from CCRIF (IEG 2012), ARC and PCRIC are usually among the first injections of cash affected countries receive in the aftermath of major disasters. Recent analysis of CCRIF, for example, concluded that 'there are indications that CCRIF had played an effective role in reducing the fiscal shocks over time' (Hochrainer-Stigler et al. 2023). Payouts depend on the level of policy coverage purchased but have been quite significant in some cases. For example, CCRIF paid out approximately USD40 million to the government of Haiti following a devastating magnitude 7.2 earthquake in 2021 (CCRIF 2022a).

ARC, CCRIF and PCRIC are rated as 'good' for fiscal stability as they are designed to relieve pressures on public finances immediately following a disaster, with the size of payouts dependent on the level of policy coverage a country has purchased. SEADRIF is not rated due to lack of information, in part a reflection of its relative newness.

Sub-criterion 2: protecting poor and vulnerable groups

Out of the four regional risk pools, ARC is the only risk pool that is explicitly taking steps to ensure that payouts for its sovereign-level products target poor and vulnerable groups. One of the features of ARC's core value proposition is that its payouts will smooth household consumption, reducing the need for negative coping strategies. This in turn requires that households receive payouts within a certain time frame. ARC's contingency plans are primarily designed as a tool to ensure that rapid payouts reach the most vulnerable people within these time frames, providing a clear 'line of sight' between supported activities and mitigating or reducing crisis impacts. In contrast, as noted in Section 5.4, while CCRIF and PCRIC currently require governments to report how payouts are used, this is not independently verified.

However, based on its successive independent evaluations, ARC-funded relief has reached households too late mainly due to factors beyond ARC's control as discussed in Section 5.4 (OPM 2022). Moreover, while ARC uses targeting criteria to identify vulnerable sub-groups, the extent to which interventions have been delivered to those most in need could not be ascertained. Due to poor monitoring and evaluation, disaggregated records on beneficiaries were not kept for any of the payouts, despite commitments to do so. Moreover, in the case of two of three drought response payouts with sufficient data, 'the assistance helped households with food consumption in less than half of the households, which is not a significant proportion of households deemed to avoid negative coping strategies' (OPM 2022). Nonetheless, there is some evidence of ARC-funded assistance providing poor and vulnerable households with much-needed relief for the limited duration of the intervention. A Senegal payout evaluation, for example, provides strong evidence that food distribution by the government and the Start Network[48] helped the large majority of households to avoid negative coping strategies such as the sale of livestock, migration for work and taking children out of school.

While the majority of CCRIF products provide general budget support to governments, CCRIF SPC has also recently launched a new product for the fisheries sector, referred to as the Caribbean Oceans and Aquaculture Sustainability Facility (COAST). Developed in partnership with the World Bank and the US Department of State, COAST policies purchased by governments are designed to pay out directly to vulnerable fishing communities (IGP, 2019). COAST therefore requires that governments have an updated fisheries database, including people in the sector who are not fisherfolk but who may work in the fish markets, such as vendors. Since the launch of COAST in 2019, uptake has been limited, with only the two pilot countries, St Lucia and Grenada, maintaining COAST policies (CCRIF 2023a).

In view of the above, ARC is rated as 'fair' under this sub-criterion, whereas PCRIC and CCRIF are rated as 'poor', given their payouts are largely provided in the form of budget support and the lack of publicly available independent evaluations. SEADRIF is not rated, given insufficient information relating to the impact of its contingency plan.

Despite the lack of robust evidence that risk pools' sovereign products are protecting poor and vulnerable groups, more positive evidence is emerging for their non-sovereign products for humanitarian agencies, which are not assessed in this paper. Both ARC and CCRIF have developed catastrophe risk insurance policies for UN agencies and other humanitarian actors; PCRIC is in the process of following suit (WFP, 2024). Based on available evidence, ARC payouts channelled through these humanitarian organisations via ARC Replica have a better track record in achieving a timely response due to having 'established systems and processes, and staff who are experienced at scaling up swiftly and delivering assistance' (OPM 2022, p. 111). In addition, CCRIF is helping create the enabling environment to scale up access to microinsurance products to better protect the livelihoods of the most vulnerable people via the Climate Risk Adaptation and Insurance in the Caribbean Project.

48 The Start Network in Senegal consists of a consortium of six NGOs, which received a payout from ARC Replica of a similar value to the Government of Senegal.

Table 11: Development impact of PAF

Instrument/provider	Fiscal stability	Protecting poor and vulnerable groups
Contingent disaster loans/grants		
ADB (CDF)	🟢	🔴
IDB (CCF)	🟢	🟠
World Bank (CAT DDO)	🟢	🔴
Climate resilient debt clauses		
IDB	⚫	⚫
World Bank	⚫	⚫
Cat bonds		
World Bank	🟢	🔴
Sovereign insurance		
ARC	🟢	🟠
CCRIF	🟢	🔴
PCRIC	🟢	🔴
SEADRIF	⚫	⚫

Legend: green = good; amber = fair; red = poor; grey = not rated due to insufficient information.

Source: Centre for Disaster Protection.

6

CONCLUSION AND RECOMMENDATIONS

The PAF landscape has changed dramatically over the past 15 years, with MDBs and regional risk pools playing an increasingly central role in improving the financial resilience of disaster-prone countries. The core rationale for PAF instruments is robust and increasing focus on them is justified, particularly in the face of climate change and the associated increase in the frequency and intensity of extreme weather events. However, there is still a long way to go in ensuring that these instruments achieve their end goal: reducing the human and economic cost of disasters. The uptake of most instruments, while growing, is still limited. with very few compelling examples of PAF having delivered transformational impact for countries or people.

At the same time it is important to recognise that PAF as a technical discipline is still relatively new. Most governments, even in higher-income countries, are still at an early stage in understanding their levels of risk from geophysical and extreme weather hazards, the potential impact of associated contingent liabilities on their development trajectories and how to use the different financing instruments to best manage those risks. On the supply side, MDBs and regional risk pool insurers covered in this report are also at different stages in their PAF journeys; some are relatively new entrants, whereas others – particularly CCRIF, IDB and the World Bank – have gained significant experience over the past decade and are in the process of innovating and expanding their product offerings. Effective coordination mechanisms also have yet to be built and tested to ensure complementarity and alignment between PAF providers, both globally and within individual countries.

In this context, this report takes stock of the main sovereign-level PAF instruments to identify what is working well and what needs to be improved based on publicly available evidence and key informant interviews. This final section summarises the key findings of the stocktake and recommends a way forward to create an architecture that better responds to the needs of vulnerable countries and people, in a world where climate change is resulting in more extreme weather and fiscal space is becoming ever more constrained.

6.1. What is working?

All the MDB and regional risk pool instruments assessed in this report have helped to reduce the fiscal vulnerability of governments to disasters through the rapid provision of liquidity. Access of quick liquidity relieves fiscal constraints on government spending on urgent response, early recovery and reconstruction following a disaster, avoiding large-scale, disruptive fiscal reallocations away from ongoing national budget priorities.

To facilitate timely and predictable disbursements and payouts, MDBs and regional pools have designed their instruments around either soft triggers, such as declarations of states of emergency, or parametric triggers. These triggers have largely delivered timely payouts that are highly valued by governments even when the amount

involved is only a fraction of the total financing need. Based on experience, most of the contingent disaster loans and grants from ADB and the World Bank that have soft triggers tend to be triggered within the first two years of approval, whereas payouts are made within a few days of a country's request for disbursement.

However, PAF instruments have varied in technical complexity, with parametric triggers particularly susceptible to basis risk and, in some cases, delays in the timeliness of payouts. There are examples where basis risk events have undermined countries' trust in the models underlying instruments, leading to non-renewals, particularly for ARC and PCRIC/PCRAFI. Delays in the reporting of event parameters and the complexity of post-event loss calculation have also led to lengthy delays in the verification process for cat bonds.

Recognising that basis risk can undermine the credibility of an instrument as a reliable source of PAF and hence demand, most providers of parametric-based instruments have taken explicit steps to manage basis risk and their clients' expectations regarding the instruments' timeliness and predictability. These include allowing a degree of flexibility in payout decisions, as in the case of CCRIF and SEADRIF, or including secondary triggers and pre-agreed fail-safes, as in the case of cat bonds and the World Bank's CRDCs. Improving the reliability and transparency of underlying models has also been a priority for most actors. PCRIC is exploring simpler policy designs to build policyholders' understanding and confidence.

The providers of the different instruments are also taking steps to make them more affordable and attractive, especially for lower-income and the most climate-vulnerable countries, not least because the providers recognise the difficult decisions governments have to make in allocating scarce financing. Government spending on PAF implies forgone development investments and, moreover, spending in anticipation of a potential disaster that might not materialise. MDBs are providing contingent disaster grants and highly concessional loans, including additional grants and concessional loans beyond country envelopes, to a subset of countries based on country-specific considerations such as income level and risk of debt distress. Regional risk pools are working with development partners to provide member countries with higher and more predictable access to premium subsidies; and IDB has reduced its fee for CRDCs, while the World Bank has used donor funds to completely cover its CRDC fee. These recent steps have started to translate into higher levels of uptake, particularly from the regional risk pools and for the World Bank's IDA Cat DDO.

6.2. What needs to improve?

The stocktake revealed the following critical insights and areas for improvement:

Evidence of the development impact of PAF is weak, requiring more and better independent evaluation of nearly all PAF instruments in this study. Although there is evidence that PAF instruments help to strengthen countries' fiscal resilience by providing quick payouts and disbursements in the aftermath of a disaster and by bringing together different parts of a government to prioritise DRM more generally, little can currently definitively be drawn from publicly available information and key informant interviews regarding their impact, either individually or collectively, on countries' poverty reduction and social development goals. This hinders learning and accountability to those affected by disasters, as well as development partners supporting the various instruments.

Similarly, based on available information, there is little substantive evidence that any of these instruments contribute to secondary goals such as reducing countries' vulnerability and exposure to natural hazards. Disaster events provide a key moment to determine whether interventions to improve preparedness and build resilience actually work, but of all the instruments covered in this stocktake only the ARC evaluation framework and IDB project completion reports are set up to systematically to learn from their experience. In addition, the results indicators used to measure the impact of the policy actions of MDBs' contingent disaster grants and loans have tended to measure outputs or processes rather than outcomes. Some indicators have also had a tenuous relationship with the objectives they were tracking or set a low level of ambition.

An additional challenge that MDBs need to address is how to evaluate a development policy operation when the outcome of the policy actions and achievement of the broader project objectives often extend beyond the time horizon of that loan or grant. Evaluation can be further

complicated when the policy actions represent only part of the effort required to achieve the desired outcome. However, given that some countries are on their third or fourth contingent disaster operation, it may be possible to evaluate the collective impact of the policy actions set by the successive programmes in each of those countries, especially if they are reinforced by the successive programmes.

Finally, beyond the MDBs, there is a near dearth of independent publicly available evaluations of regional risk pools. ARC is the only risk pool for which independent evaluation reports and updated cost benefit analyses have been published. While the other pools have their own internal monitoring and evaluation systems, independent evaluation and its release into the public domain is essential to provide fresh perspectives and insights on performance to all PAF providers, as well as to redress potential bias in self-assessment and evaluation. Independent evaluation can highlight what works and where assumptions and theories of change, and therefore approaches and instruments, need to be adjusted.

Creating processes and incentives that improve the utilisation of disbursements and payouts is critical. The intervention logic underlying these instruments, particularly those that provide budget support, generally assumes that governments will use the quick liquidity provided to mount effective disaster response and early recovery actions, and minimise the disruption of essential services. The reality, however, is that government systems and processes, particularly in lower-income and capacity-constrained environments, are rarely configured to proactively respond to disasters, as highlighted by the experience of ARC (OPM 2022) and broader public financial management evaluations (PEFA 2022). In the case of ARC, while payouts are tied to a pre-agreed contingency plan, weaknesses in public financial management systems have undermined implementation of these plans. Consequently, the plans have not consistently led to timely assistance being delivered to targeted vulnerable households.

At the same time budget support as a modality for delivering aid has many potential advantages, increasing country-level ownership, building country capacity and strengthening country systems via the accompanying policy actions (Fardoust et al. 2023). The case for budget support appears particularly strong where governments' own resources are used to secure pre-arranged financing coverage. But budget support is not a panacea. Strong public financial management systems are one of the key factors for ensuring that resources are allocated to development priorities, funds are spent efficiently and principles of accountability are upheld. While the programmes accompanying MDBs' contingent disaster loans and grants typically include policy actions to strengthen these systems, they take time to build. Meanwhile, the regional risk pools lack the capacity, resources and experience of MDBs, as well as the close relationships with ministries of finance, to support countries in developing these systems and processes.

MDBs and regional risk pools should support governments in identifying and addressing the bottlenecks that prevent the implementation of pre-agreed plans, and the timely and effective utilisation of public finance for disaster responses more broadly. Without such action, the benefits of PAF may be much diminished.

Greater basis risk analysis and validation are essential in creating robust PAF triggers that meet the needs of governments. Fit-for-purpose triggers are a crucial feature of PAF instruments, but trigger design currently largely happens in a black box for parametric instruments. IDB provides the most detailed publicly available information on parametric trigger structures, detailing them in the operating regulations that accompany each of its CCF loans. The triggers for IDB's CRDCs build on these same triggers. While trigger information is also available in cat bond offering materials, these documents are not usually publicly available.

This lack of transparency hinders the process of learning. While certain providers have tended to use certain types of triggers (e.g all World Bank-issued cat bonds to date have used cat-in-a-grid parametric triggers), no instrument requires a specific type of trigger and there is thus scope to change and amend triggers as lessons are learnt, preferences change and technology improves. This is particularly important if instruments such as CRDCs and cat bonds are to expand to a wider set of hazards and regions for which reliable parametric triggers are not currently available at an affordable cost.

6.3. Areas for further research

Understanding the perspectives of recipient country governments on PAF and their providers. Few countries have taken sufficient advantage of the array of available PAF instruments to apply a wide range in combination. There is scope for many of the PAF instruments to cover a wider set of countries and, within countries, to cover a more meaningful proportion of government contingent liability. However, this requires much better understanding of governments' preferences and the factors shaping their incentives to pre-arrange financing before disasters, including what they value in these instruments and their perceived weaknesses. This information is vital for MDBs and regional risk pools to effectively support their client countries by shaping their strategies and financing instruments in accordance with countries' needs.

Country-level analysis is therefore needed to explore the specific factors shaping the choice of instruments, including the extent to which those decisions are informed by economic analysis and political considerations – and the extent to which those decisions are influenced, favourably or otherwise, by offers of subsidies and additional grant resources tied to particular instruments.

Assessing the cost-effectiveness of instruments to development partners. The cost multiple analysis compares the total cost and payout to the client government of different PAF instruments. It finds that an IDA Cat DDO grant is 100% subsidised, whereas ARC is only 60% subsidised yet ARC still has the lowest cost multiple for certain risks. This analysis employs several simplifying assumptions to estimate how much of the costs to governments are being covered by development partners per unit of payout based on the grant element of loans and share of premium support. It does not consider other instrument-related costs usually covered by development partners such as capital and operational costs and technical assistance, as well as benefits beyond the payout. In an environment where donor finances are stretched, there is even more need for development partners to ensure that scarce international public finance is used optimally to build countries' resilience to shocks.

Assessing the opportunities and challenges of using PAF for early action. Few of the instruments covered in this report are currently designed – let alone used – to finance early action, such as the distribution of drought-resistant seeds ahead of a growing season with forecasts of poor rainfall. It is unclear, based on available evidence, whether this is because of a lack of demand from governments for this type of product or the complexities in designing impactful early action interventions. Pre-arranging financing for early action is likely to require a different level of operational readiness to avoid missing the window of opportunity for action and to ensure meaningful engagement with at-risk communities. The relevance and cost-effectiveness of PAF for early action, especially through risk transfer mechanisms, should be further explored and tested.

In conclusion the toolkit for pre-arranging disaster financing is evolving and expanding and it makes sense to use those instruments that provide the most cost-effective protection, taking into account a government's specific objectives, preferences and capabilities. People can become enthused by the application of scientific or financial innovations when a much simpler, more cost-effective solution may exist. It is important that each PAF instrument is seen as a means to an end rather than an end in itself. This requires greater focus on the contribution of PAF instruments to their end impacts, and the development objectives of governments and international partners.

LIST OF ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank
ARC	African Risk Capacity Ltd.
Cat DDO	Catastrophe Deferred Drawdown Option (World Bank)
CCF	Contingent Credit Facility (Inter-American Development Bank)
CCRIF	Caribbean Catastrophe Risk Insurance Facility
CDF	Contingent disaster financing (Asian Development Bank)
CERC	Contingent emergency response component
CERP	Contingent emergency response project
CRDC	Climate resilient debt clause
CRW	Crisis Response Window
DPO	Development Policy Operation
DRF	Disaster risk financing
DRF+	Expanded Disaster and Pandemic Response Facility
DRM	Disaster risk management
IBRD	International Bank for Reconstruction and Development (of the World Bank Group)
IDA	International Development Association (of the World Bank Group)
IDB	Inter-American Development Bank
MDB	Multilateral development bank
NPV	Net present value
PAF	Pre-arranged financing
PCRIC	Pacific Catastrophe Risk Insurance Company
PEF	Pandemic Emergency Financing Facility
SEADRIF	Southeast Asia Disaster Risk Insurance Facility
WFP	World Food Programme

GLOSSARY

All definitions have been developed by the Centre for Disaster Protection unless stated otherwise.

Basis risk

Basis risk is the difference between an index and the shock the index is supposed to be a proxy for. A payout triggered by an index may be higher or lower than a beneficiary's losses, leading to an overpayment or a shortfall, respectively. Where opinion differs between stakeholders over what the index is supposed to be a proxy for, the precise definition of basis risk can be contested. For example, disagreement may arise over whether an agricultural insurance product that uses a rainfall-based index covers drought-induced crop disease and pest damage (Centre for Disaster Protection).

Climate resilient debt clause

A climate resilient debt clause is a provision in sovereign debt contracts that enables the borrower to temporarily stop repaying debt service (interest, principal or both) for a pre-agreed period when a predefined event occurs. These built-in debt deferrals can be designed to be net present value (NPV) neutral and not extend the instrument's original maturity date. Also known as a 'debt pause clause' or 'nautral disaster clause'.

Contingent disaster loan or grant

A type of pre-arranged financing whereby a loan or grant is approved in advance of a crisis and guaranteed to be provided to a specific implementer when a specific pre-identified trigger condition is met.

Cost multiple

The expected NPV total cost of an instrument divided by the expected NPV disbursement.

Disaster risk financing

The system of budgetary and financial mechanisms to credibly pay for a specific risk, arranged before a potential shock. This can include paying to prevent and reduce disaster risk, as well as preparing for and responding to disasters.

Early action

Action that takes place before a hazardous event occurs predicated on a forecast or credible risk analysis of how the event will unfold. Some actors have a wider definition of early action that includes activities that take place after the hazardous event, but before the disaster reaches its peak (REAP 2022). For this paper, however, we use a narrower definition focused on financing actions before the event occurs.

Pre-arranged financing

Financing that has been approved in advance of a crisis and that is guaranteed to be released to a specific implementer when a specific pre-identified trigger condition is met. The trigger may be based on data or models related to impacts, forecasts or projections of need, or a declaration of emergency (or similar) by the specified respondent. The funding may be used for anticipatory action or in response to a crisis, either linked to a clear plan for a very specific purpose or as general budget support.

Resilience building

The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management (UNDRR 2024).

Total crisis financing

A subset of international development financing that includes activities and flows to organisations whose primary purpose is to deliver prevention, preparedness and response to crises.

Trigger

A trigger is a predefined threshold of an index underlying a risk finance mechanism that, if exceeded, prompts a payout. A trigger may also leave an element of discretion to a designated party about whether or not to launch a response activity.

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ANNEX 1: KEY INFORMANT INTERVIEWS

Organisation	Name	Position
Asian Development Bank	Erik Aelbers	Principal Planning and Policy Economist
Inter-American Development Bank	Arturo Javier Pita Gussoni	Treasury and Risk Senior Specialist
Inter-American Development Bank	Juan José Durante	Principal Financial Markets Specialist
Inter-American Development Bank	Hongrui Zhang	Financial Sector Senior Specialist
World Bank	Niels B. Holm-Nielsen	Practice Manager, Global Facility for Disaster Reduction and Recovery (GFDRR)
World Bank	Steen Byskov	Senior Financial Officer
African Risk Capacity	Lesley Ndlovu	Chief Executive Officer
African Risk Capacity	Lorraine Njue	Reinsurance Actuary
Pacific Catastrophe Risk Insurance Company	Richard Poulter	Independent Consultant
Southeast Asia Disaster Risk Insurance Facility	Ellen Yong	Chief Operating and Financial Officer

ANNEX 2: CALCULATION OF GRANT ELEMENT OF CONCESSIONAL LOANS

The grant element of a concessional loan is the difference between the face value of the loan and the present value of the debt service payments to be made by the borrower.

The grant element of a concessional loan (expressed as a percentage of the loan) is calculated by using the annuity formula:

$$1 \quad PV_g - PV_N \text{ where}$$

$$PV_g - r * \frac{1 - \frac{1}{d_g}}{n * d} \text{ where } d=(1+D)^{\frac{1}{n}} - 1, \text{and } d_g = (1+D)^g$$

$$PV_N = \left(\frac{r}{n}\right) * \left[\frac{1}{\left(1+\frac{r}{n}\right)^N - 1} + 1\right] * \left(\frac{1}{d_g}\right) * \left(\frac{1 - \frac{1}{d_p}}{d}\right), \text{ where}$$

$$d_p = (1+D)^P$$

where r = interest rate; m = maturity (year); n = number of repayments per annum; D = discount rate; p = principal repayment periods(s) (year) (m-g); N = total number of repayments (p*n); and g = interval (year).

The key assumptions are as follows:

- **Fixed interest rates –** non-concessional loans from MDBs typically have floating interest rates based on a market rate (and spread); however, to calculate concessionality we have used representative terms based on the most recent financial terms for the instrument and extended it across all periods of the financial instrument.
- **Discount rate –** we use 5% as this is standard for the OECD DAC methodology.
- **Structure of repayments** – there is flexibility within each individual loan agreement as to the amortisation schedule and repayment of the loans. Common structures include equal repayment amounts, level payments across two periods with a step change and one final lump sum. We assumed all loans have equal payments (in line with the above annuity formula) from the end of the grace period to loan maturity (although there were some step changes in principal repayment and bullet loans).
- In accordance with OECD DAC calculations, we have not considered the up-front cost of these financial instruments nor any other fees that might be incurred at the beginning of the instrument's life/on the day of disbursement, given the disbursement assumption above.

ANNEX 3: METHODOLOGY AND ASSUMPTIONS FOR COST MULTIPLE CALCULATION

This section provides further details about the methodology used to evaluate the cost multiple for each instrument, as well as the key assumptions used. For further details of the framework, see Haq et al. forthcoming.

The framework considers each PAF instrument from the viewpoint of a government. Assumptions have been derived from available data, including a review of a sample of transaction documents for each MDB, and simplifications made where necessary.

Discount rates of 5% and 10% were used to determine the present value of future cashflows for each instrument. The choice of 5% was for consistency with the OECD DAC discount rate, which is used to calculate the grant equivalent of loans for the affordability criterion. A second rate of 10% was used given a multitude of countries use these instruments; the sovereign borrowing rate of 10% is broadly in line with current yields on loans for several countries. IDB also uses a social discount rate of 10–12% in the ex-ante and ex-post economic analysis it undertakes for its CCF loans.

Instrument-specific assumptions

MDB contingent loans and grants

Cost multiples for governments are based on the cost of repaying loans, any fees paid initially or when money is disbursed, and the value of the loss of any funding forgone to access contingent loans. For example, if a government agrees a contingent loan but as a result can borrow USD100 million less directly from MDBs, we assume the government must borrow USD100m from the market at the sovereign borrowing rate, producing an additional opportunity cost to the government. The sovereign borrowing rate is assumed to be equal to the discount rate.

In deriving assumptions for the three cost multiple components, we reviewed 38 contingent loans from the World Bank (from 2008 to 2023), 25 contingent loans and grants from ADB (from 2017 to 2023) and 13 CCF loans from IDB (from 2012 to 2022). Where possible, we have taken averages for different agreements to determine parameters such as grace periods, fees, loan terms and interest rates.

For instruments where interest rates refer to market-based rates such as LIBOR/SOFR, we used 4.35%, based on the current 20-year US Treasury yield as this is approximately in line with the average loan term for existing loans under these instruments.

The resulting assumptions are given in Table 12.

Catastrophe bonds

Cost multiples for cat bonds are based on expected risk multiples, which are calculated from a review of previously issued cat bonds. These are then reduced by the premium subsidies provided.

Risk margin (that is, the risk-based component of the premium) and modelled expected loss information have been collected from a combination of public sources, including Artemis.bm, and validated against information from World Bank press releases for individual cat bonds where available. A linear model was fitted to the distribution of historical risk margin and modelled expected loss data for cat bonds issued since 2020 to represent the current capital markets pricing environment.

The risk margin for three previous World Bank-issued cat bonds has been fully paid with donor premium financing. A concessionality factor of 13% has been calculated by taking the ratio of the premiums (payable over the full term of the bonds) funded through grants to the total premiums for cat bonds issued under the Capital at Risk Notes programme since 2017.

Sovereign insurance (via regional risk pools)

Cost multiples for sovereign insurance from regional risk pools are based on expected risk multiples. These are then reduced by the average level of premium subsidies provided in recent years.

Risk multiples from ARC and CCRIF were obtained from publicly available information, specifically ARC's cost-benefit analysis (Kramer et al. 2020) and the World Bank project appraisal of the grant for the 2021 Jamaica cat bond (World Bank 2021). PCRIC provided the risk multiple for its most recent policy year 2023.

Representative factors of 15%, 60% and 55% for CCRIF, ARC and PCRIC policies, respectively, have been selected to reflect approximate levels of concessionality based on levels of premium support reported in recent years' accounts.

Table 12: Assumptions for calculating the cost multiple of MDB contingent loans and grants

Instrument	Proportion of funding from country allocation of MDB resources (% of country allocation)	Deferred disbursement option (yes or no)	Interest rate (%)	Drawdown period (years)	Total loan term (years)	Grace period (years)	Front-end fee (% of principal)	Fee on disbursement (% of disbursed amount)
World Bank IDA grant	25	No	N/A	3	N/A	N/A	N/A	N/A
World Bank IDA loan	25	No	1.50	3	40	10	0	0
World Bank IBRD loan	100	No	6	3	20	7	0.50	0
ADB grant (DRF+)	0	Yes	N/A	3	N/A	N/A	N/A	N/A
ADB grant	100	Yes	N/A	3	N/A	N/A	N/A	N/A
ADB loan	100	Yes	5.25	3	15	3	0.25	0
IDB CCF	0	No	5.55	5	25	5.5	N/A	0.50

Source: Centre for Disaster Protection and UK Government's Actuary Department based on MDB websites and product notes.

ANNEX 4: COST MULTIPLES OF PRE-ARRANGED FINANCING INSTRUMENTS AT 5% AND 10% DISCOUNT RATES

The following tables show the cost multiple for each of the financial instruments for different return periods at the 5% and 10% discount rates. The colour coding shows the instruments with the lowest cost multiple across the return periods in green, graduating to red for the highest cost multiple

Table 13: Cost multiple for government at 5% discount rate

Instrument/provider		1 in 1	1 in 3	1 in 5	1 in 10	1 in 25	1 in 50	1 in 100	1 in 250
Contingent loans or grants	World Bank Cat DDO								
	IDA loan	0.6	0.7	0.8	1.0	1.6	2.7	4.8	11.3
	IDA grant	0.3	0.4	0.5	1.0	2.3	4.5	8.8	21.9
	IBRD loan	1.1	1.1	1.1	1.1	1.1	1.2	1.3	1.5
	ADB CDF								
	ADF DRF+ grant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ADF grant	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2
	ADB loan	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	IDB CCF								
	IDB loan	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Cat bonds	World Bank cat bond	1.2	1.3	1.3	1.5	1.9	2.6	4.0	8.1
Sovereign insurance	ARC	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	CCRIF	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	PCRIC	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Source: Haq et al. forthcoming

Table 14: Cost multiple for government at 10% discount rate

Instrument/provider		1 in 1	1 in 3	1 in 5	1 in 10	1 in 25	1 in 50	1 in 100	1 in 250
Contingent loans or grants	World Bank Cat DDO								
	IDA loan	0.4	0.5	0.7	1.0	2.0	3.8	7.2	17.6
	IDA grant	0.3	0.4	0.6	1.0	2.4	4.7	9.2	22.9
	IBRD loan	1.0	1.2	1.4	1.9	3.6	6.3	11.8	28.3
	ADB CDF								
	ADF DRF+ grant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ADF grant	1.0	1.1	1.2	1.3	1.3	1.3	1.3	1.3
	ADB loan	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1
	IDB CCF								
	IDB loan	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Cat bonds	World Bank cat bond	1.2	1.3	1.3	1.5	1.9	2.6	4.0	8.1
Sovereign insurance	ARC	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	CCRIF	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	PCRIC	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Source: Haq et al. forthcoming

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