

Global efforts to fight the consequences of climate change: the role of Regional Financing Arrangements

This study provides an overview of steps taken by Regional Financing Arrangements (RFAs) to incorporate climate considerations into their activities, covering the areas of economic monitoring, lending, capacity building, and internal policies and operations. It aims to deepen the RFAs' understanding of how their regional peers are approaching the emerging policy issue of climate change, and to stimulate collective reflections on how best to support members' efforts to foster a more sustainable and resilient future.

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Introduction

Climate change is an existential global threat. The Intergovernmental Panel on Climate Change (IPCC) notes that the Earth is approximately 1.1 degree Celsius (°C) warmer than pre-industrial times due to heat-trapping greenhouse gases, mainly carbon dioxide, emitted by human activity (IPCC, 2021). As temperatures rise, extreme weather and climate events such as cyclones and droughts become more frequent and severe and slow-moving trends like surging sea levels keep advancing, threatening the lives and livelihoods of millions of people worldwide. The landmark Paris Agreement adopted in 2015 aims to limit the global temperature increase to well below 2°C, preferably 1.5°C, to stave off the worst impacts of climate change (United Nations Climate Change, 2022). To attain this goal, global carbon dioxide emissions would need to almost halve from 2019 levels by 2030, reaching net-zero in the early 2050s (IPCC, 2022a).

The global investments needed to tackle climate change will be enormous and far greater than existing flows. The Climate Policy Initiative (2021) estimates that climate finance must reach USD 4 trillion annually by 2030 to stay on the 1.5°C pathway. This is almost seven times higher than the amount realised in 2019–2020 on average. Similarly, the International Monetary Fund (IMF) estimates that annual adaptation costs of about 50 low-income and developing economies could exceed 1% of their gross domestic product (GDP) in the coming decade (Georgieva et al., 2022). These financing needs arise just when many economies are grappling with increased debt burdens due to measures taken to mitigate the health and economic impacts of the Covid-19 pandemic and tighter global financial conditions. Countries with less fiscal space and those looking to achieve secure and affordable energy access while reducing their carbon footprints will need the most help.

Faced with intensifying climate hazards, countries need to act on two fronts. First, they should adapt and build resilience to minimise the harmful effects of environmental trends already in motion. This could imply difficult policy decisions, particularly for nations with limited resources and competing developmental priorities. Second, countries should prepare to transition to a low-carbon economy consistent with the Paris Agreement targets and so secure a liveable future. These crucial adjustments could require radical resource reallocations that may prove disruptive if not managed properly, impacting vulnerable households as well as business and workers in high-emission sectors. Careful attention is therefore needed to ensure a fair transition that leaves no one behind.

To complement and support government actions, global and regional institutions and forums are intensifying their engagement on climate issues. Their engagement ranges from mobilising climate finance and technical assistance to build capacity, to carrying out research, developing analytical tools, and disseminating knowledge and policy recommendations. In addition, much work is being done to improve data infrastructures and foster the coordination and harmonisation of policies. The regional crisis fighters also have a role to play, within the remit of their mandates, in helping progress the global, multifaceted solution. Climate change can adversely affect macroeconomic conditions in various ways, such as asset prices, fiscal positions, and trade flows. This could have potential repercussions for macroeconomic and financial stability, which is at the heart of RFAs' missions.

This study provides an overview of steps taken by RFAs thus far to incorporate climate considerations into their activities. It examines, as applicable, actions by the regional crisis prevention and resolution funds to extend technical advice to help countries build resilience against climate shocks; enhance economic monitoring to better account for climate vulnerabilities and risks and offer more guidance to members on how to address them; incorporate climate-related elements in lending toolkits and policies; and integrate environmental, social, and governance (ESG) aspects into internal policies and operations. Overall, this study aims to deepen RFAs' understanding of how their peers are approaching the evolving policy issue of climate change, and so stimulate collective reflections on how best to support members' efforts towards a more sustainable and resilient future.¹

Six major RFAs are the object of the study. These are: the Arab Monetary Fund (AMF), the Association of Southeast Asian Nations (ASEAN)+3 Macroeconomic Research Office (AMRO), which is the macroeconomic surveillance unit of the ASEAN+3 region that also supports the implementation of the Chiang Mai Initiative Multilateralisation (CMIM);² the Eurasian Fund for Stabilization and Development (EFSD); the European Union's Macro-Financial Assistance (MFA), which is managed by the European Commission; the European Stability Mechanism (ESM); and the Latin American Reserve Fund (FLAR).

The study is structured as follows. Section 1 describes channels through which climate change-related risks can impact macroeconomic and financial stability and impinge on RFAs' missions. Section 2 presents selective observations on trends and risks related to climate change to offer an impression of similarities and diversity across regions. Section 3 outlines examples of global and regional climate-related initiatives, recognising the wider climate agenda within which RFAs operate. Section 4 offers a snapshot of sustainability and climate-related actions by the RFAs in response to climate change. Section 5 provides the main takeaways and considerations for the future.

¹ For simplicity, when referring to the memberships of RFAs and other institutions, the study uses the term members, as opposed to member states or member countries, in lowercase.

² ASEAN was established on 8 August 1967. Its member states are Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam while the ASEAN+3 consists of the abovementioned states, plus China, Japan, and the Republic of Korea.

1. Climate change and macroeconomic and financial stability: a role for RFAs on climate issues

Risks associated with climate change are usually divided into physical and transition risks. Physical risks include the financial losses and economic costs from damage to property, infrastructure, and land that can be caused by extreme weather and climatic events or follow longer term, less visible shifts such as ocean acidification. Transition risks result from changes in climate policy, technology, and consumer and market preferences during adjustments to a lower-carbon economy. While a move towards a greener economy could enhance growth by, for instance, promoting investment in renewable energies, it can put certain sectors under strain.³ Sectors with a high-carbon footprint are most exposed, especially if the adjustment is sudden or disorderly. A country does not need to contribute significantly to greenhouse gas emissions to be sensitive to transition risks. It could, for example, suffer higher energy prices that arise from global mitigation efforts. Transition and physical risks are interrelated, with physical risks becoming more likely or pronounced the longer societies take to reduce emissions.

Capturing the impact of climate-related risks on the financial sector and the broader economy is difficult and remains a work in progress. At the core of the challenge lie deep uncertainties about the manifestation of disasters, not least due to the long-term nature of such phenomena and the existence of tipping points that could fundamentally change the earth's system.⁴ Moreover, the evolution of and damage created by climate change are policy-dependent. Many other complications stem from data gaps, the need to assess events for which there is no recent historical experience, and the possibility of feedback loops between the real and the financial sectors.

Climate-related risks could trigger detrimental effects on economic conditions in several ways, with potential repercussions for macroeconomic and financial stability. The extent to which countries are impacted will depend on their exposure and vulnerability to climate risks, economic structures, the level of institutional and economic development, and each country's ability and degree of policy and financial space to adapt and respond to potential damage, among other factors. Transmission channels include:

- **Output losses and reduced growth prospects.** An extreme weather event can generate large economic losses and reduce production capacity by destroying human and physical capital. Climate change could, in addition to rendering some places on Earth inhabitable, lower productivity by increasing mortality, negatively affecting health, and reducing the performance of workers exposed to heat, human capital accumulation, and agricultural yields.⁵ ⁶ Low-income countries are the most vulnerable because they tend to be situated in regions with hotter climates, have more limited resources to tackle climate change, and depend more on outdoor work such as agriculture, fisheries, and forestry.⁷

³ For instance, the International Energy Agency (2021) estimates that a global transition to net-zero by 2050, which would result in a clean and resilient energy system, would put global GDP 4% higher in 2030 than it would be based on current trends. Research also shows that the costs associated with the green transition would be greater were climate action delayed (see e.g. IMF, 2022a).

⁴ Examples of tipping points include melting permafrost and the loss of the Amazon rainforest. For more information, see <https://www.nature.com/articles/d41586-019-03595-0>.

⁵ The World Health Organization (2021) expects that between 2030 and 2050, under a medium-high emissions scenario, climate change will cause about 250,000 additional deaths per year from, among others, malnutrition and heat stress.

⁶ Assuming that temperatures will not exceed 1.5°C by the end of the century, the International Labour Organization projects that an equivalent of 2% of total working hours worldwide will be lost each year by 2030 due to it being too hot to work or workers having to work at a slower pace (Kjellstrom et al., 2019).

⁷ This is supported by studies that find a non-linear effect of rising temperature and per capita growth, where an increase in temperatures in countries with high average temperatures reduces growth while the opposite is true in those with cooler climates (see e.g. IMF, 2017).

- **Worsening public sector balance sheets.** Natural disasters can lead to unplanned expenditures for disaster relief, reconstruction, and recovery, materialised contingent liabilities due to support for distressed companies or financial institutions, and foregone tax revenue following activity disruptions across affected sectors or regions. Climate adaptation and mitigation require resources to, for instance, offer renewable energy subsidies. This spending may not be fully offset by alternative revenues such as from carbon pricing instruments. Moreover, there is increasing evidence that climate-vulnerable countries could face higher borrowing costs, which may restrict their access to finance.⁸ Such developments could strain debt sustainability.
- **Deteriorating corporate and financial sectors balance sheets.** The physical manifestation of climate change and emissions-curbing policies could cause large and sudden re-evaluations of the assets of financial and non-financial firms and reduce profitability, undermining financial stability in the absence of appropriate prudential policies. Similarly, uncertainty about regulatory and supervisory approaches to address climate-related risks could lead to disruptive disinvestment from carbon-intensive industries or regions exposed to physical risks. Meanwhile, the insurance sector will experience a rise in claims alongside increased frequency and magnitude of natural catastrophes, testing its ability to provide protection.⁹ As insurance premiums adjust to cope, costs for firms and people would amplify, restricting access in some cases.¹⁰
- **Adverse effects on trade balances.** Climate change can negatively affect the external sector in many ways. For instance, in the long run, countries that depend on fossil fuel exports are at risk of experiencing a reduction in their main source of income as the green transition progresses. Goods exports from sectors sensitive to physical risks, like agriculture and tourism, could also be affected. Commodity importers could face higher food and energy prices due to such triggers as disruptions in global value chains, falling agricultural production, and emission mitigation policies. The resulting global redistribution of income could in turn put pressure on exchange rates.
- **Weakening social fabric and worsening inequality.** Climate change can act as a ‘crisis multiplier’ and undermine domestic stability. Rising temperatures and associated natural disasters can impair access to basic needs such as food, fresh water, and habitable ambient temperature, which could trigger migration flows and aggravate social conflicts.¹¹ Actions to limit global warming could increase inequality, hitting harder those low-income households that spend a larger share of their income on energy and food and that tend to contribute the least to global emissions.¹² These developments could have ramifications for growth and poverty.¹³

⁸ See, for instance, Cevic and Jalles (2020) that investigate the impact of climate-vulnerability on sovereign bond spreads and Klusak et al. (2021) that look at how climate change may impact sovereign ratings. The latter find that, under a high emissions scenario, 63 sovereigns (out of 108 analysed) would suffer climate-induced downgrades by 2030.

⁹ Swiss Re (2021) estimates that natural catastrophes caused USD 105 billion in global insured losses in 2021, the fourth highest since 1970. The insured losses exceeded the previous 10-year average, continuing the trend in recent decades of an annual 5-6% rise in losses.

¹⁰ Munich Re’s chief climatologist has warned that in the long run this could become a social issue as some people in some regions will no longer be able to buy insurance (Neslen, 2019).

¹¹ Most climate-related migration occurs within borders. The World Bank forecasts that by 2050 there could be up to 216 million internal climate migrants globally – driven by water scarcity, declining crop productivity, and sea-level rise (Clement et al., 2021).

¹² The yellow-vest movement in France, known as the *gilets jaunes*, showed how discontent with climate public policy can manifest socially.

¹³ The World Bank (2020) estimates that by 2030, climate change will drive 68 million to 135 million into poverty.

The potential for climate change to affect macroeconomic and financial stability brings the issue to the heart of RFAs' missions of preventing and resolving crises. RFAs were created to provide liquidity buffers to members experiencing financing difficulties and to safeguard macroeconomic and financial stability in their respective regions. While dealing with the consequences of climate change is currently not explicitly part of their mandates, regional funds and their shareholders increasingly recognise the risk that climate change poses to economic prospects and countries' capacity to avoid and manage crises. RFAs will need to search for ways, within the remit of their mandates, to support their regional economies' efforts to adapt and build resilience to climate impacts, while capturing the opportunities offered by low-carbon, sustainable growth. This may call for steps to adjust and strengthen activities and frameworks to provide financial, technical, and policy support to members, as appropriate depending on heterogeneous institutional settings and the needs of members.

2. Climate-related trends and risks: selected observations across RFA regions

While global warming and the associated physical processes affect the whole world, manifestations differ at regional and country levels. This section provides a picture of such nuances across regions. For simplicity, we apply regional labels as defined in the previous joint RFA staff project on regional responses to the Covid-19 crisis.¹⁴ These labels are: the AMF region consisting of AMF members; the ASEAN+3 consisting of AMRO/CMIM members; the euro area consisting of European Union (EU) countries that have adopted the euro as their single currency and are also ESM members;¹⁵ the EFSD region consisting of EFSD members; the MFA beneficiaries represented by 10 Covid-19 MFA package beneficiary countries; and the FLAR region consisting of FLAR members. The analysis is based on publicly available data.¹⁶

RFA regions have not been spared from the observed changes in the Earth's climate, in line with disquieting global trends. Compared to a baseline period of 1951–1980, all regions are experiencing a warming of annual mean temperatures at various rates (Figure 1). In parallel, the number of climate-related disasters in RFA regions has increased in recent decades, with the ASEAN+3 region experiencing the largest exposure (Figure 2). Asia is one of the most vulnerable areas to climatic disasters because of its geographic conditions, notably natural hazard-prone landscapes such as long coastlines and relatively large landmasses (United Nations Office for Disaster Risk Reduction, 2020). While flood and storms together accounted for most of the reported events between 1980 and 2021 in RFA regions, there has been great diversity in disaster types (Figure 3). The countries in this study are together responsible for half of global carbon dioxide emissions embodied in production, driven by a few large greenhouse gas emitters in the group.¹⁷ China increased its total share of carbon dioxide emissions since its 2001 accession to the World Trade Organization, to around 29% in 2015 from around 20% in 2005 (Figure A.1 in the Annex). Conversely, for the same period, the United States decreased its share of global carbon emissions to around 16% from 22% and the euro area to 7% from 10%.

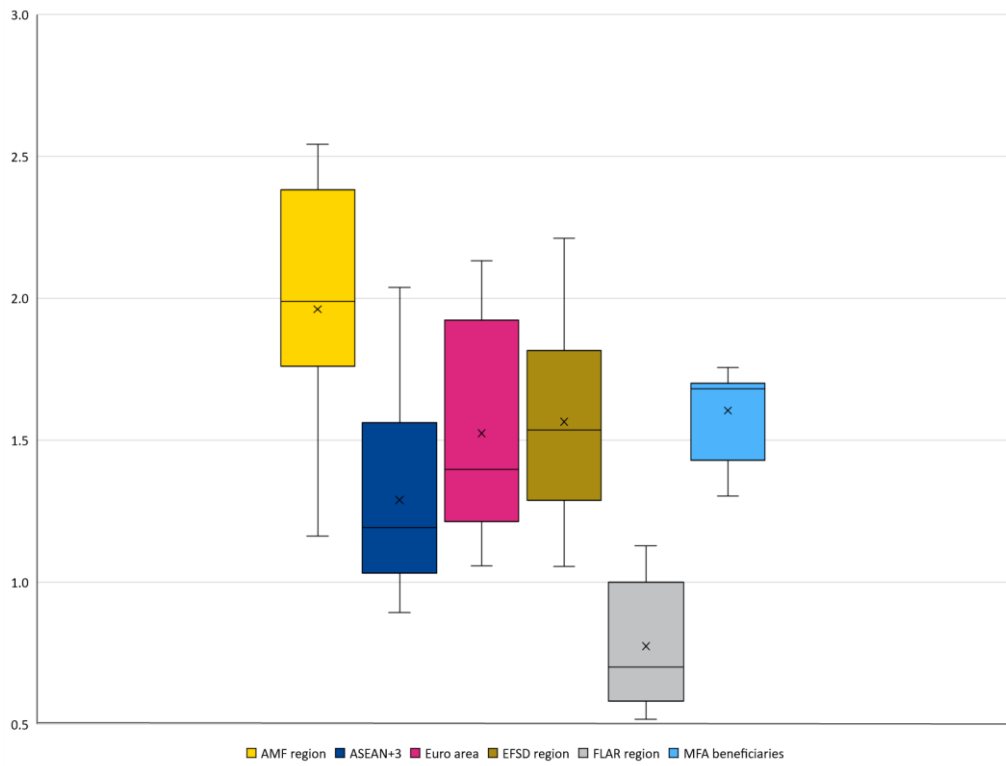
¹⁴ For more information, see Schiliuk et al. (2021) and Table A.1 in the Annex.

¹⁵ Membership as of 2022. The analysis excludes Croatia which became the ESM's 20th member on 22 March 2023.

¹⁶ The data sources used do not always cover all the countries in our dataset. The methodologies and calculation methods may differ across indicators for measuring physical exposure, the number of natural disasters, and other climate-related risk aspects.

¹⁷ Calculations by the authors based on data from Organisation for Economic Co-Operation and Development (OECD) trade in embodied carbon dioxide database.

Figure 1
Annual mean temperature increase in 2021 compared to baseline period (1951–1980)
 (in °C)



Note: “X” corresponds to the mean value.
 Sources: IMF Climate Change Dashboard, which uses data from the Food and Agriculture Organization, authors’ calculations

Figure 2
Frequency of climate-related disasters
 (in number of events)

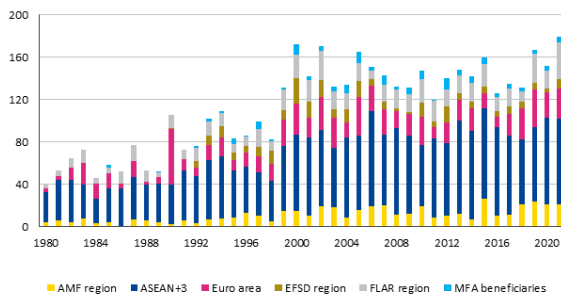
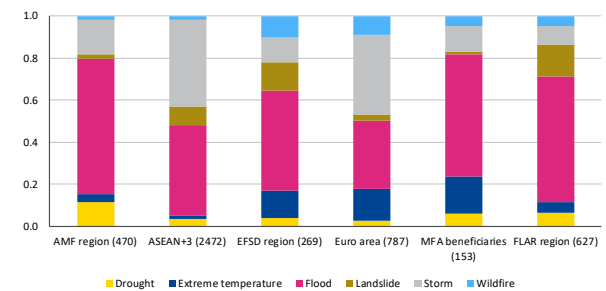


Figure 3
Events by disaster type, 1980–2021
 (share of the total per region)



Notes: Both graphs only cover the six types of climate-related disasters reported in the IMF Climate Change Dashboard. The regional frequencies correspond to the aggregated number of disasters that took place in each economy that is currently a member of a given RFA. This may result in an underestimation in certain geographies. Figure 3 provides the total number of disasters per region in parentheses.
 Sources: Emergency Events Database (EM-DAT), authors’ calculations

The worsening climate trends are disrupting lives, with extreme weather events triggering population displacements in all regions (Table 1). As early as 1990, the IPCC warned that the greatest single impact on climate change might be on human migration, caused by shoreline erosion, coastal flooding, and agricultural disruption (Brown, 2008). In ASEAN+3 economies, nearly 150 million people were displaced internally between 2008 and 2021, with storms, extreme temperatures, and floods as main drivers. AMF and FLAR regions have also been

notably affected. This is in line with IPCC (2022b) which posits that droughts, floods, and rainfall variability threaten food and nutrition security and the livelihoods of millions globally, with the poor in parts of Asia, Africa, and South and Central America disproportionately affected.

Table 1
Number of internally displaced people due to natural disasters, 2008–2021

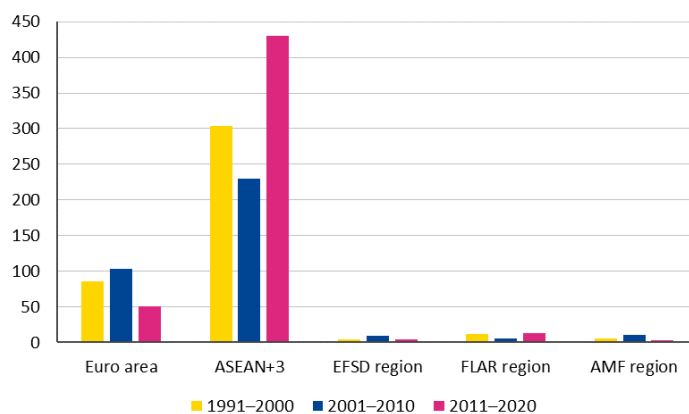
Region	Drought	Flood	Extreme temperature	Storm	Wildfire	Total
AMF region	1,403,930	4,725,792	11,400	268,408	38,611	6,448,141
ASEAN+3	5,400	63,768,514	1,017,034	84,980,218	64,948	149,836,114
Euro area	0	208,227	25	21,082	184,786	414,120
EFSD region	0	224,310	500	1,400	24,554	250,764
FLAR region	0	5,268,618	9,924	66,005	36,128	5,380,675
MFA beneficiaries	0	157,868	0	1,410	3,502	162,780

Notes: For information on monitoring methodology of internal displacement see: <https://www.internal-displacement.org/monitoring-tools>
Landslides are not included in the Internal Displacement Monitorin Centre database.

Sources: Internal Displacement Monitorin Centre database, authors' calculations

Climate-related disasters are causing significant economic damages in RFA regions. Losses associated with weather disasters have been most notable in ASEAN+3 economies, reflecting their higher overall frequency in the region (Figure 2 and Figure 4). In comparison to GDP, the ASEAN+3 and FLAR regions appear relatively more affected than other regions (see Figure A.2 in the Annex).¹⁸ The output losses from a single catastrophe can be very large, especially for smaller economies (Table 2). Still, no country is immune from the budgetary impacts of such shocks, including advanced economies. For instance, natural disasters in the early 2000s caused damages of 1.9% of GDP in Latvia and of 1.1% of GDP in Austria (see Table A.2 in the Annex).

Figure 4
Total damages due to climate-related disasters
(in USD billion, adjusted)



Notes: Only events that correspond to the six types of climate-related disasters reported in Figure 2 and for which data on estimated economic damages was available are considered. MFA beneficiaries are not included due to limited data availability across decades.

Sources: EM-DAT, authors' calculations

¹⁸ Research suggests that income classification of an economy is a significant predictor of the data availability on economic damages in the Emergency Events Database, with data availability of economic losses tending to be higher for advanced economies than in lower income and developing countries (Jones et al., 2022).

Table 2
Top 10 disasters in RFA regions by total damages to GDP, 2000–2021

Year	Disaster type	Country	Region	Damages to GDP (in %)
2008	Extreme temperature	Tajikistan	EFSD region	16.4
2008	Storm	Myanmar	ASEAN+3	15.7
2021	Drought	Somalia	AMF region	13.4
2011	Flood	Thailand	ASEAN+3	10.8
2007	Storm	Oman	AMF region	9.3
2007	Drought	Moldova	MFA beneficiaries	9.2
2000	Drought	Georgia	MFA beneficiaries	6.4
2000	Drought	Tajikistan	EFSD region	5.8
2000	Drought	Armenia	EFSD region	5.2
2000	Flood	Cambodia	ASEAN+3	4.4

Notes: The ratio compares unadjusted economic damages to nominal GDP in the year the reported natural disaster started. Only events for which data on damages was available are considered. Some disasters persist longer than 12 months, but the costs beyond the first year are not considered when calculating the ratio.

Sources: EM-DAT, IMF World Economic Outlook (WEO) April 2022, authors' calculations

Insurance coverage for past economic losses from natural disasters in RFA regions has been limited. Disaster insurance plays an important cushioning role, minimising adverse shocks to economies and supporting recovery. But across RFA regions insurance covered less than half the reported damages in about two-thirds of the climate-related disasters between 2000 and 2021, for which information on total and insured losses was available.¹⁹ Large differences exist within regions. For instance, about 60% of losses caused by a storm in Japan in 2019 were insured, compared to just single digit insurance coverage in other ASEAN+3 region disasters (Table 3). On average, disasters in the euro area were better covered, but the region may still be underperforming. Swiss Re (2021) estimates the 2021 floods in Germany, Belgium, and neighbouring countries as the costliest natural disaster of that year in Europe causing up to USD 13 billion in insured losses compared to total economic losses of above USD 40 billion, exposing a large flood protection gap.

Table 3
Reported insurance coverage of the top 10 disasters ranked by total adjusted damages, 2010-2021

Year	Disaster type	Country	Region	Insurance coverage (in %)
2011	Flood	Thailand	ASEAN+3	25.0
2021	Flood	Germany	Euro area	24.3
2016	Flood	China	ASEAN+3	2.0
2010	Flood	China	ASEAN+3	0.3
2019	Storm	Japan	ASEAN+3	58.8
2020	Flood	China	ASEAN+3	2.1
2013	Flood	Germany	Euro area	14.0
2018	Storm	Japan	ASEAN+3	72.0
2013	Storm	Philippines	ASEAN+3	7.0
2018	Flood	Japan	ASEAN+3	25.3

Notes: Insurance coverage is calculated as the ratio of insured losses to total adjusted economic damages per disaster in a given year. Only the disasters for which information on insured and total losses was available are considered.

Sources: EM-DAT, authors' calculations

¹⁹ Authors' calculations based on data extracted from the Emergency Events Database.

There are limitations to using data on economic losses associated with a catastrophe, which may explain the rise of indices that analyse global climate change risk patterns.²⁰ Data on damages suffer from underreporting, particularly in Africa and South Asia, and for certain types of disasters such as droughts (United Nations Office for Disaster Risk Reduction, 2020).²¹ Poorer countries have lower technical capacity to estimate losses, a task further complicated by an often large informal economy. In addition, damages do not capture climate risks that have not yet manifested in a disaster nor the risks' multidimensional nature whereby a combination of features such as environmental, geographic, social, and economic may explain climate hazards and their impact. Despite differences in design and methods, indicator-based assessments generally try to capture a country's climate and disaster risk position, making them useful tools for cross-country comparisons. They are often composite, using a variety of building blocks ranging from types of hazards, exposure and vulnerability to those hazards, and variables that proxy the capacity to deal with the given risk.

In Figures 5 through 8 we use two indices to identify climate-related risks across RFA regions. To capture physical risks, we draw on the INFORM Risk Index, a global, open-source risk assessment for humanitarian crises and disasters that supports decisions about prevention, preparedness, and response. It has three dimensions: human and natural hazard risks; the vulnerability of the communities faced with hazards; and lack of coping capacity of infrastructure and institutions for emergency response and recovery.²² This paper uses the INFORM Risk index as adapted by IMF staff to distil and focus on climate-driven risks. To identify transition risks, we use an indicator created by Peszko et al. (2020) that focuses on exposures to fossil fuel dependency and countries' preparedness to diversify rents incurred from fossil fuels.²³

RFA regions exhibit different degrees of vulnerability to physical risks from climate change. The euro area is much less exposed to physical risks than all other regions, with all euro area countries having a climate-driven INFORM Risk score below the average for the RFA group (Figure 5). Strong intra-regional variation reflects the heterogeneity observed at the country level in features related to geography, economic sectors of importance, and levels of development. When focusing on sub-components of the adjusted INFORM Risk Index, the ASEAN+3 economies appear most vulnerable to climate-driven hazards as do several countries in the AMF region (Figure 6). Overall, countries with greater exposure to climate-driven hazards tend to have weaker abilities to cope with disasters and alleviate their impact.

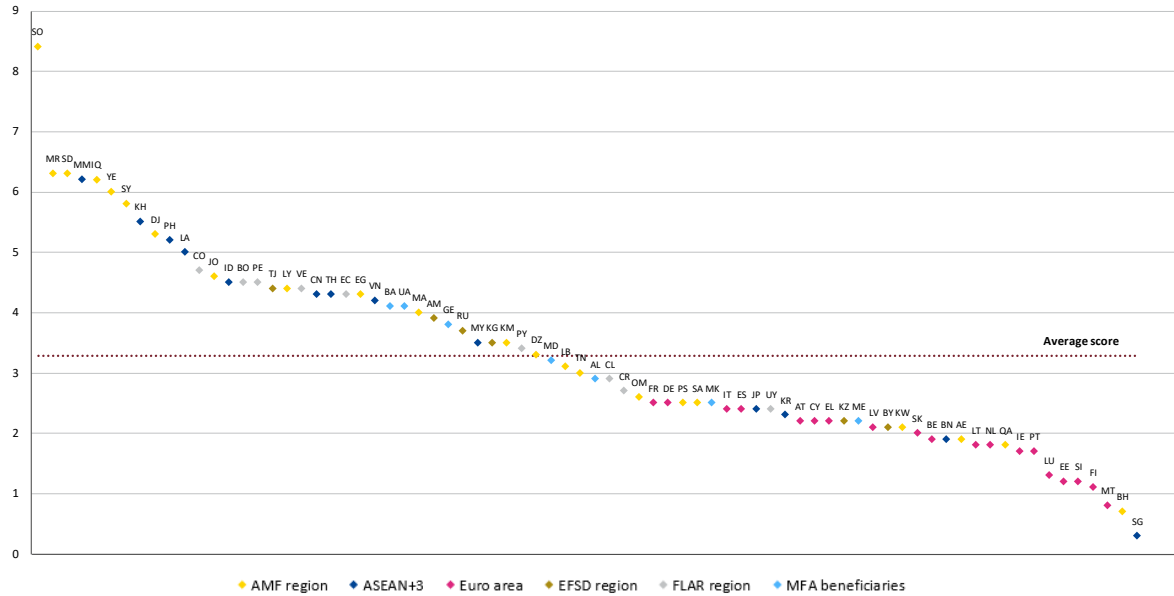
²⁰ Examples of composite indices include the World Risk Index, Global Climate Risk Index, and Notre-Dame Global Adaptation Country Index.

²¹ There are other concerns to using such data to gauge economic damage, including the fact that they do not reflect distributional effects, which are difficult to assess especially in coastal settlements (IPCC, 2022a). Similarly, comparing losses to GDP could fail to capture important welfare losses in local populations.

²² For more information on the methodology, see <https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Methodology>.

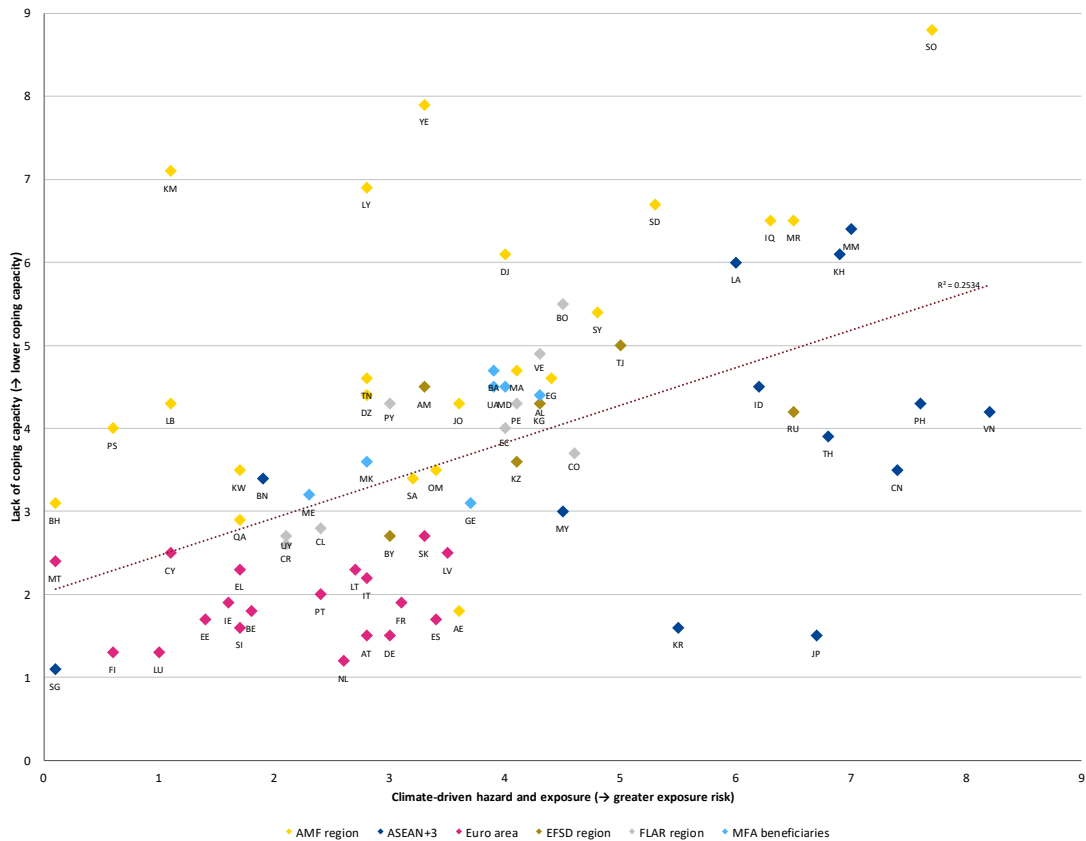
²³ For more information on the approach, see <https://openknowledge.worldbank.org/bitstream/handle/Allowed=y>.

Figure 5
Physical risk: climate-driven INFORM Risk scores (2021)
 (index, scale 0-10)



Notes: The higher the indicator, the higher the risk. Countries are abbreviated according to the two letter code ISO classification.
 Sources: IMF Climate Change Dashboard, which uses adjusted data from the INFORM Risk Index, authors' calculations

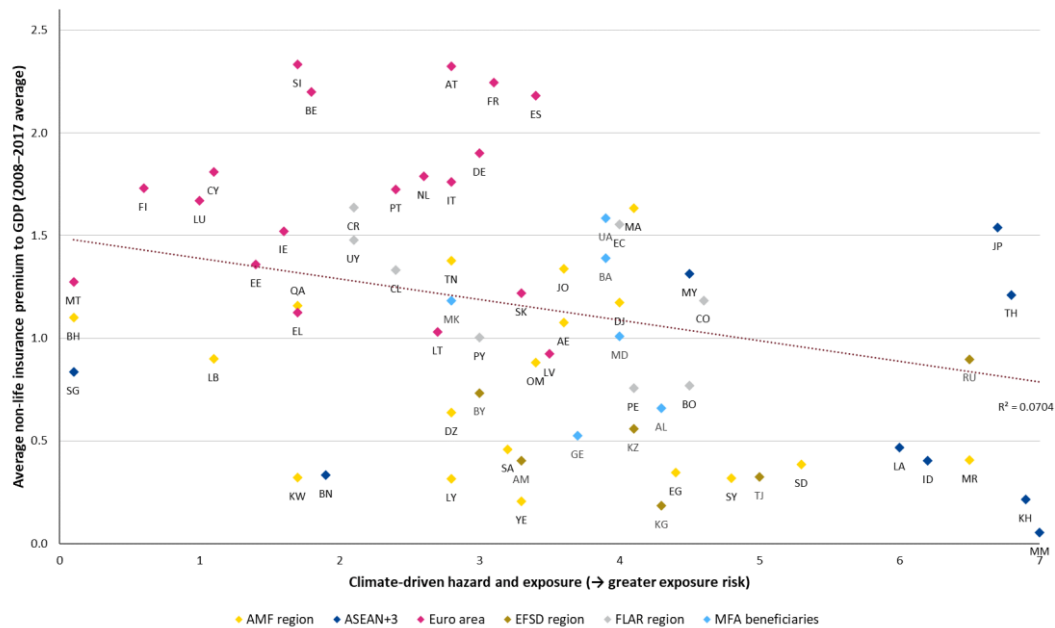
Figure 6
Physical risks: climate-driven hazard & exposure and coping capacity
 (index, scale 0-10)



Notes: This is a comparison of two sub-components of the climate-driven INFORM Risk Index. Countries are abbreviated according to the two letter code ISO classification.
 Sources: IMF Climate Change Dashboard, which uses adjusted data from the INFORM Risk Index, authors' calculations

Economies most exposed to climate-driven hazards do not always have high financial protection (Figure 7). High insurance penetration – proxied by the average non-life insurance premium to GDP between 2008–2017 – can financially cushion against a climatic disaster’s adverse economic impact and thus help preserve financial stability. Euro area countries generally have a higher insurance penetration and lower exposure to climate-driven hazards relative to other regions. Using an indicator of insurance company assets to GDP likewise suggests that most countries in RFA regions do not have large insurance sectors, which may limit the sector’s capacity to protect people and assets (see Figure A.3 in the Annex).

Figure 7
Insurance penetration and exposure to climate-driven hazards
 (y-axis in ratio; x-axis as index, scale 1-10)



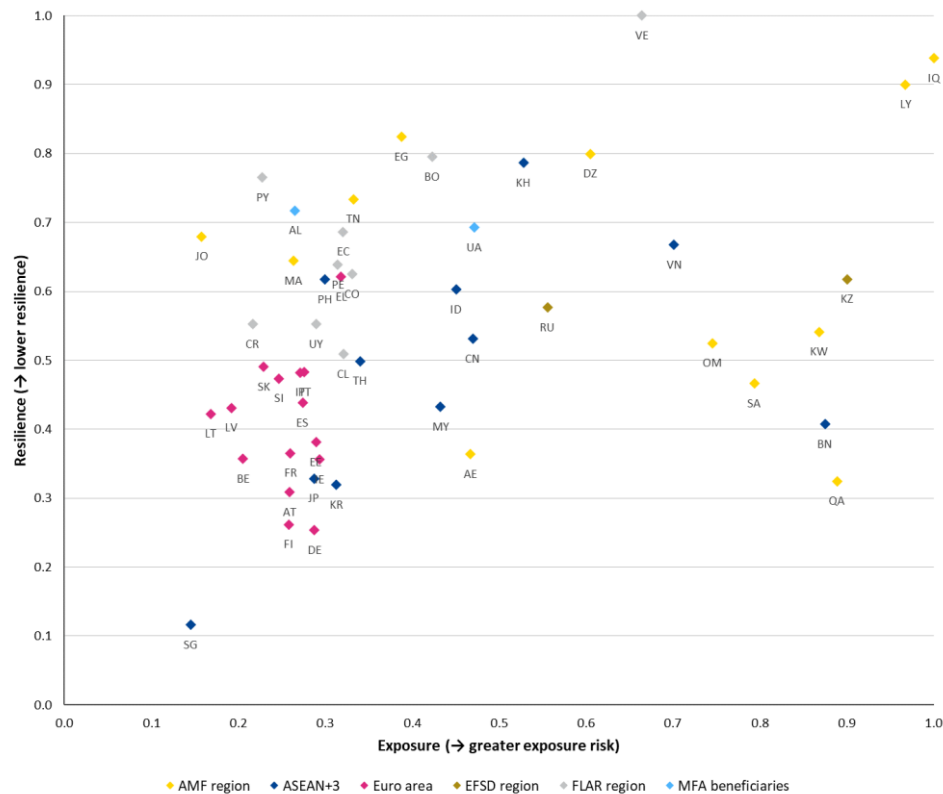
Notes: Non-life insurance premiums comprise both the actual premiums payable by policyholders to obtain insurance cover during the accounting period (premiums earned) and the premium supplements payable out of the property income attributed to insurance policyholders, but excluding social contributions. Countries are abbreviated according to the two letter code ISO classification.

Sources: IMF Climate Change Dashboard, which uses data from the World Bank Global Financial Development Database, authors’ calculations

There is similarly much heterogeneity across regions when it comes to transition risks. Figure 8 indicates how prepared countries are to maximise the opportunities and mitigate the risks resulting from a transition to a low-carbon economy. Several countries in the AMF region with high fossil fuel rents show the highest relative exposure to transition risk.²⁴ Euro area and selected ASEAN+3 (Japan, Korea, and Singapore) economies present relatively lower exposure and higher degrees of resilience to a low-carbon economy transition, which might be explained by higher degrees of diversification, among other factors.

²⁴ The Organization of the Petroleum Exporting Countries (2022) forecasts long-term world oil demand to be around 110 million barrels per day in 2045, a rise from almost 97 million barrels per day in 2021. For producers that do not transition away from fossil fuels, this could point to a continued possibility of exploiting fossil fuel revenues for decades to come.

Figure 8
Transition risks – preparedness of countries for a low-carbon transition
(index, scale 0-1)



Note: Countries are abbreviated according to the two letter code ISO classification.

Sources: IMF Climate change Dashboard, which uses data from Peszko et al. 2020, authors' calculations

Climate risks could affect financial institutions in RFA regions, with implications for financial stability and the sector's capacity to help finance the green transition. In a first of-a-kind exercise, the European Central Bank (ECB) conducted a top-down economy-wide climate stress test to assess the impact of climate risk on the euro area banking system over the next 30 years, using three climate policy scenarios. The exercise encompassed around four million companies worldwide and 1,600 banks, covering up to 80% of bank loans held in the euro area. The results reveal that euro area banks could be severely affected if climate change is not mitigated, with risks concentrated in certain geographical areas and sectors and the impact on banks' expected losses driven mainly by physical risks (Alogoskoufis et al., 2021). An ECB bottom-up climate stress test in 2022 across 41 leading institutions shows potential credit and market losses amounting to around €70 billion in total from just two extreme weather events and under a short-term disorderly transition (ECB, 2022). The ECB also noted that the estimates understate actual climate-related risk.

Financial sectors will need to prepare for the gradual trend to a carbon-neutral economy. This could result in a rebalancing of financial institutions portfolios' away from projects with environmental concerns and towards clean and green investments. For instance, analysis from AMRO (2020) concludes that ASEAN+3 financial institutions as a group represent the largest funding pool of coal projects globally, exceeding those of the United States and Europe combined. At the same time, regulators and policymakers will need to be mindful of the impact such rebalancing could have on energy security and affordability.

3. RFA efforts to address climate change within a wider context: selective climate action initiatives

The rising collective awareness that it will take concerted and comprehensive action to maintain a liveable Earth has prompted a range of initiatives aimed at preserving this global public good. The severity and urgency of the climate crisis calls for more constructive multilateralism and new ways of thinking about global commons that could deliver on clear and ambitious policy commitments, public-private partnerships to mobilise financing, and analytical tools and data to guide effective policy making (Shanmugaratnam, 2022). RFAs, as part of the Global Financial Safety Net and to the extent that their mandates allow, should contribute to the globally coordinated climate agenda – thereby complementing efforts by other actors. This section presents selected examples of global and regional initiatives to convey a sense of this wider context.²⁵ Each institution and forum is presented separately, though many regularly work together or provide input to each other’s work.

An umbrella for the multilateral climate agenda: the UN, G7, and G20

The United Nations (UN) Framework Convention on Climate Change constitutes an umbrella for global climate action, laying out global targets for mitigation, adaptation, and climate finance. The convention entered into force in 1994 with a goal of preventing dangerous human interference with the climate system by stabilising greenhouse gas concentration. Its highest decision-making body adopted the Paris Agreement in 2015 to provide a durable framework for guiding efforts to limit global warming to well below 2°C, preferably to 1.5 °C, compared to pre-industrial levels. Agreement implementation is based on a five-year cycle of increasingly ambitious national adaptation plans carried out by signatories. The UN climate change agenda is supported by, among others, two specialised agencies: the World Meteorological Organisation and the UN Environmental Programme. Both inform the work of the IPCC, an intergovernmental body providing policymakers with regular scientific assessments on climate change.

The Group of Seven (G7) and the Group of Twenty (G20) offer a platform for informal policy coordination and for advancing debate on climate change issues and related country commitments. The G7 established a climate mitigation working group comprising two complementary workstreams to support the multi-year transition to net-zero – one on climate change mitigation policies and the other devoted to macroeconomic/modelling work.²⁶ Also under Germany’s G7 presidency, leaders agreed to establish an open and inclusive international Climate Club by the end of 2022 to support the effective implementation of the Paris Agreement by accelerating climate action and increasing ambition, with a focus on industrial decarbonisation.²⁷ At the G20 level, the Sustainable Finance Working Group developed a multiyear document called the Sustainable Finance Roadmap that informs the G20 climate agenda by focusing on key areas such as making climate reporting more consistent and comparable; supporting investments towards sustainability goals; enhancing international financial institutions’ efforts to implement the Paris Agreement; and promoting the broader adoption of tools to explore the nexus between climate risks and financial stability. The document identifies opportunities for the G20 to coordinate members’ efforts through

²⁵ This section is based on publicly available information, mainly websites of the respective forums and institutions concerned, mostly collected up to the summer of 2022. The overviews are not exhaustive in terms of the activities that these actors are carrying out on climate change issues.

²⁶ The activity of the group will continue in 2023 under Japan’s G7 Presidency.

²⁷ The Climate Club Terms of Reference were endorsed by Leaders in December 2022. In addition, in late 2022, the G7 jointly with an association of states that are particularly threatened by climate change, launched the Global Shield Against Climate Risks, which is an initiative for pre-arranged financial support designed to be quickly deployed when climate disasters strike.

ongoing international work across different forums and informs relevant work by international organisations and networks.

Policy advice, lending, and capacity building: the International Monetary Fund

Recognising that climate change can lead to macro-critical challenges, the IMF has been stepping up its efforts on climate issues over the past few years. For example, it is assisting members through the provision of financing for climate-related urgencies and policy guidance, conducting extensive research on the economic implications of climate change, identifying climate-related financial stability risks, offering capacity development support, and contributing to closing data gaps. In July 2021, the IMF Executive Board approved a strategy to help members address climate change-related policy challenges.²⁸ The strategy lays the ground for a more systematic inclusion of climate topics into the activities of the IMF in line with its mandate.

Selected steps include:

- **Surveillance.** The strategy proposes covering macro-critical climate-related policies comprehensively in surveillance reports on individual members, with more frequent discussions for the most vulnerable members and largest emitters of greenhouse gas. It also envisages the need to review transition management to a low-carbon economy, a macro-critical challenge for the entire IMF membership. The IMF has suggested to expand the coverage of climate risk in its financial stability analysis and include a stress testing component in in-depth analyses of members' financial sectors.²⁹ This surveillance work is being supported by the development of various models and tools such as global macroeconomic models with detailed energy production to analyse sectoral and trade impact of climate policies, and debt sustainability analysis modules to account for the fiscal cost of climate change mitigation and adaptation. Finally, IMF flagship publications, regional economic outlook reports, policy papers, and staff climate notes provide an extensive source of research and expertise.
- **Lending.** The IMF has provided financial assistance to members hit by natural disasters via its Rapid Financing Instrument and Rapid Credit Facility.³⁰ Moreover, and as stated in its 2021 strategy, climate measures such as carbon pricing could be included in the design of all IMF programmes when seen as critical for resolving balance of payments issues of an affected member. In April 2022, the IMF established the Resilience and Sustainability Trust (RST) to help eligible countries address longer-term, structural challenges, including climate change.³¹ RST funding could be used to augment policy space and financial buffers to mitigate the risks arising from climate change, thereby contributing to prospective balance of payment stability. The reforms supported by the RST are also intended to catalyse increased financing from the private sector, donors, and other international financial institutions. Almost two-

²⁸ For more information on the strategy, see IMF (2021).

²⁹ Adrian et al. (2022) illustrate the methods used in Financial Sector Assessment Programmes to deal with climate change risks, including examples of recent applications.

³⁰ In addition, the Catastrophe Containment and Relief Trust allows the IMF to provide grants for debt relief for the poorest and most vulnerable countries hit by catastrophic natural disasters (or public health disasters). In 2010, the IMF provided grants for debt relief to Haiti following a devastating earthquake under the predecessor of the Catastrophe Containment and Relief Trust.

³¹ The RST became operational in October 2022 (IMF, 2022b). For more information on the RST, see IMF (2022c).

thirds of the countries in RFA regions analysed in this study are eligible for the longer-term affordable financing from the RST.³²

- **Capacity building.** As climate-related demands from the membership continue to increase, the IMF is considerably ramping-up its capacity development activities to improve members' fiscal, financial, and macroeconomic climate resilience, and enhance their climate data collection and reporting capabilities. Several of its climate capacity development tools such as the Climate Macroeconomic Assessment Program, Climate-Sensitive Management of Public Finances, and Climate Public Investment Management Assessment support this work. Realising the pivotal role of reliable data for macroeconomic and financial climate analysis, in April 2021 and in cooperation with other international organisations, the IMF launched its Climate Change Indicators Dashboard. The dashboard aims to become a comprehensive aggregator for statistical indicators on inter alia greenhouse gas emissions and green finance, trade in environmental goods, and governmental climate policies.

Climate finance: the World Bank Group

The World Bank Group is a leading force in multilateral climate finance, supporting developing countries to mitigate greenhouse gas emissions and increase resilience to climate impacts. Between 2016 and 2021, it delivered over USD 109 billion in climate finance, making it the biggest multilateral funder of climate investments in developing countries. In its 2021 Climate Change Action Plan, the World Bank Group committed to increasing its climate finance target to 35% from 26% of total commitments over 2021–2025, while aligning all financing flows with the objectives of the Paris Agreement by July 2023. Over the same period, it agreed to prioritise transformative public/private investments in five key systems that contribute the most to emissions and face significant adaptation challenges, namely energy; agriculture, food, water, and land; cities; transport; and manufacturing. On a more technical level, the World Bank Group has launched a new diagnostic tool: the Country Climate and Development Report, which consists of a country-based report offering a blueprint for national climate priorities. It is expected to be a useful core analytical product to inform discussions between the World Bank Group and its clients as well as governments, other multilateral banks, and the private sector to help identify and build consensus around key priorities and strategies. In addition, the World Bank hosts the Climate Change Knowledge Portal, which provides global data on historical and future climate, vulnerabilities, and impacts.

Box 1: The role of Multilateral Development Banks (MDBs) in regional climate investment

MDBs are important regional partners of the RFAs. They play a vital role in global efforts to achieve carbon neutrality and to enable implementation of national adaptation plans. The banks work with their clients to develop plans aimed at integrating the transition to a net-zero emissions and climate-resilient economy with programmes in key sectors such as energy, cities, food and land use, water, and industry. They also support countries in designing and piloting carbon pricing instruments, including carbon taxes, and fossil fuel subsidy reduction.

Bringing the world on a sustainable development path requires significant resources. Developing countries face the greatest risks from climate change while being the least able to afford the structural transformation needed to reduce their climate vulnerability. Annual adaptation costs in developing countries alone are expected to reach USD 140–300 billion in

³² Calculation by the authors based on IMF (2022c).

2030 and USD 280–500 billion in 2050 (UN Environment Programme, 2021). Support from the international community will be required to meet these needs. Total MDB climate finance reached USD 66 billion in 2020, of which more than half was allocated to low- and middle-income countries (European Bank for Reconstruction and Development, 2021). This mobilised additional USD 85 billion in climate co-finance commitments.

MDBs are stepping up their role in climate finance. Several MDBs published their joint approach towards aligning their financial flows with Paris Agreement goals and pledged greater ambition for the post-2020 period by setting portfolio targets for climate positive investment. In Asia and the Pacific as well as Latin America and the Caribbean, which are among the world’s most climate vulnerable regions, MDBs play a leading role in deploying innovative strategies and necessary financing. As the regions seek to decarbonise, the Asian Development Bank will commit at least 75% of its operations to climate change mitigation and adaptation by 2030, whereas the Asian Infrastructure Investment Bank aims to reach or surpass 50% by 2025. In Latin America and the Caribbean, the Inter-American Development Bank set an annual floor of 30% for climate finance in the bank’s operations for 2020–2023. Meanwhile in Europe, the European Investment Bank committed to gradually increase its share of green financing to over 50% by 2025 (European Bank for Reconstruction and Development, 2021).

Regulation and supervision: Financial Stability Board

The Financial Stability Board contributes to the financial sector’s resilience by coordinating work of national financial authorities and international standard-setting bodies to address climate-related financial risks. In July 2021, it published a roadmap that supports international coordination on four interrelated areas: firm-level disclosures, data, vulnerabilities analysis, and regulatory/supervisory tools. The roadmap provides input for broader international policy considerations by facilitating communication with G20, G7, and UN global climate summits. Moreover, the document stresses the Financial Stability Board’s readiness to serve as a forum for discussing cross-sectoral and systemic issues to reduce market fragmentation. The work on disclosures builds on the recommendations by the Taskforce on Climate-related Financial Disclosures created in 2015 to improve and increase reporting of climate-related financial information.

Global networking: the Network of Central Banks and Supervisors for Greening the Financial System and the Coalition of Finance Ministers for Climate Action

The Network of Central Banks and Supervisors for Greening the Financial System (NGFS), launched in 2017, aims to accelerate the scaling up of green finance and contribute to the development of environmental and climate risk management in the financial sector. It brings together more than 100 central banks and supervisors and several observers (among them the ESM, AMRO, and FLAR). The 2022–2024 work programme covers topics such as supervisory practices with respect to managing climate-related risks, capacity building for NGFS members, and design and analysis of scenarios. The design and analysis of scenarios might be of special interest for the RFAs. Climate scenarios help central banks and supervisors explore possible impacts on the economy upon which policy decisions can be made. The efforts focus on the modelling of acute and chronic physical risks across geographies within the scenarios, improving their macroeconomic modelling, and developing additional short-term adverse scenarios for stress testing purposes. The scenarios form a key part of scientific assessments such as those conducted by the IPCC.

The Coalition of Finance Ministers for Climate Action, established in 2019, aims to demonstrate leadership of fiscal and economic policymakers in responding to climate change. Finance ministers play a leading role in spearheading climate action by using fiscal policy tools like carbon taxes and emissions trading systems to advocate for a better alignment of public budgets with climate goals and supporting the expansion of green financing instruments. Over 70 countries are members of the coalition. The coalition created a cross-thematic work programme built around six core elements of Helsinki Principles, helping countries to align policy actions with the Paris Agreement and implement the national climate action plans, establish best practices, share experience on climate budgeting and strategies for green investment, or integrate climate change in macroeconomic management and public finance.

Regional policy coordination: the EU and the ASEAN

Climate cooperation in the EU

The EU is at the forefront of international efforts to fight climate change. Under the Paris Agreement, the EU committed in 2021 to cutting greenhouse gas emissions to at least 55% below 1990 levels by 2030 and climate neutrality by 2050. The European Green Deal serves as Europe's roadmap towards this goal. In July 2021, the European Commission introduced a legislation (called Fit for 55 package) that will allow Europe to reach the Green Deal targets. It foresees a series of measures aimed at translating the deal's pledges into action that will directly impact how Europeans live and do business. In addition, to meet the EU's climate and energy targets for 2030, the European Commission introduced an EU taxonomy to reorient capital flows towards sustainable projects and activities. The taxonomy is a common classification system establishing a clear list of environmentally sustainable economic activities. Providing a clear common language and a clear definition of sustainability plays a critical role in helping the EU scale up sustainable investment and mobilise greater volumes of private capital, while implementing the European Green Deal. It provides companies, investors, and policymakers with appropriate definitions for which economic activities can be considered environmentally sustainable. In this way, the EU taxonomy creates security and protects both public and private investors from companies giving a false impression of environmental benefits, known as greenwashing, helps companies to become more climate-friendly, mitigates market fragmentation, and shifts investments where they are most needed.

The EU Recovery and Resilience Facility, an EU flagship initiative, allows the European Commission to raise funds to help member states implement reforms and investments that are in line with the EU's priorities, including achieving climate neutrality by 2050. To accelerate the green transitions, each member must dedicate at least 37% of the expenditures of its national recovery and resilience plan to measures contributing to climate objectives. The reforms and investments proposed by countries have exceeded these targets: for the facility as a whole, estimated climate expenditure amounts to about 40%. In addition, the European Commission intends to issue up to €250 billion (30% of NextGenerationEU's total issuance) in green bonds between now and end-2026, which would make it the largest green bond issuer in the world.

The European Commission is also introducing fiscal sustainability risks due to climate change into the EU fiscal sustainability framework. Tentative quantification of fiscal implications of acute physical risks was included in the 2021 EU Fiscal Sustainability Report, through stylised stress tests on selected EU members. Work going forward will involve the construction of policy scenarios, notably to capture transition risks.

Finally, the recent plan RePowerEU accelerated a number of the EU climate objectives. The plan, presented in response to the hardships and global energy market disruption caused by Russia's invasion of Ukraine, aims to rapidly reduce dependence on Russian fossil fuel and fast forward the green transition, while increasing the resilience of the EU-wide energy system by (i) saving energy, (ii) producing clean energy, and (iii) diversifying the energy supplies.

Climate cooperation in the ASEAN region

Confronting climate change in the Southeast Asia region requires ASEAN policymakers to collaborate on climate risks and responses despite varying levels of socioeconomic development and vulnerability to climate issues across the economies. The new work programme of the ASEAN Agreement on Disaster Management and Emergency Response guides the region's efforts to better withstand the impact of climate disasters, and towards building a more resilient ASEAN community. It encourages coherence and complementarities between regional and global frameworks and policy agenda for humanitarian action, vulnerability reduction, and sustainable development besides promoting enhancements to ASEAN's disaster risk reduction and management frameworks. To strengthen regional financial resilience, in 2018, the ASEAN+3 established the Southeast Asia Disaster Risk Insurance Facility. This platform enhances regional preparedness by providing insurance products and risk management solutions against climate shocks and disasters. To facilitate sustainable finance adoption and orderly transition by ASEAN countries, the ASEAN Taxonomy for Sustainable Finance provides a common language for the labelling of economic activities and financial instruments across different jurisdictions. The ASEAN community also issues its State of Climate Change Report which provides an outlook on the state of climate change in the region and outlines collaboration opportunities towards 2050 climate targets. The 2021 report underscored the importance of raising capacities on climate science in the ASEAN region and the need to significantly boost members' access to climate finance as well as knowledge and technology transfer.

4. RFA institutional responses to climate change

The Covid-19 crisis demonstrated the importance of building resilience against and preparing for future economic shocks, including those originating from natural phenomena. Against this backdrop, the RFAs have engaged in institutional deliberations on their role in helping members address climate challenges within the remits of their mandates. Guided in some cases by strategic work programmes, they have kicked off internal climate and sustainability-related work in various business areas and are reflecting on whether and to what extent they should take further steps in the future. This section overviews some of the actions taken by regional rescue funds in this respect, covering the areas of economic monitoring, lending toolkit and policies, capacity building, and internal policies and operations.³³

Economic monitoring

Several RFAs are enhancing economic monitoring analytical tools and capabilities in response to the challenges posed by climate change. The efforts aim to, among other things, better capture climate-related developments, recognise the build-up of vulnerabilities and risks in their regions, and offer advice to members on how to address them, as applicable.

AMRO, the only RFA with a surveillance mandate, has been working with its members to incorporate the emerging and structural issue of climate change into its macroeconomic surveillance function. AMRO is therefore embarking on many initiatives and workstreams that it has incorporated in its work programme. These include (i) mainstreaming climate change risk assessment in country surveillance work; (ii) analysing the impact of climate change risks to the ASEAN+3 financial sector; (iii) exploring how extra-regional policy changes will affect the ASEAN+3 economies' long-term outlook through, for example, trade, investment, and fiscal channels; and (iv) undertaking analysis on various mitigation policies, such as the use of carbon pricing mechanisms and in the development of green finance and green technology in the ASEAN+3, among others. More recently, AMRO has supported its members with a stocktaking of the latest developments in transition finance within the ASEAN+3 region, through a survey that gathered ASEAN+3 members' concerns and recommendations regarding regional development realities and transition needs. The results of this survey were reflected in a report that highlighted recommendations to its members for future cooperation. AMRO's work to deepen its expertise on climate also helps it guide its members' economic transformations. For instance, the 2022 Annual Consultation Report on Malaysia provided the authorities with advice on furthering disaster preparedness and implementing policies that incentivise the shift to low-carbon domestic activities.

The EFSD is working on enhancing its country monitoring work through various activities. It plans to (i) introduce climate modules into its debt sustainability models within a year after the IMF publishes an official update to the methodology; (ii) incorporate the average impact of climate shocks in long-term baseline projections; and (iii) introduce natural disaster stress tests to capture shocks associated with one-off climate events over the medium-term.

The ESM is deepening its analyses on the implications of climate change for financial stability and integrating this work into its country monitoring framework. The ESM looks at macrofinancial risks when monitoring the financial stability of the euro area and its members. As climate change-related risks might affect financial stability in the region, the euro area RFA is reviewing its tools to better assess the impacts of climate risks, understand how they could impair countries' financing capabilities, and identify potential amplifiers and mitigants to such risks. The ESM strategy on climate-related issues aims at integrating climate risk into the ESM's

³³ This section is based on information collected up to end-2022.

macrofinancial analysis and early warning activities by, among other things, (i) assessing country-specific exposure to climate risk, including with regard to liquidity, and resulting ESM exposure; (ii) integrating climate risks into the monitoring of fiscal sustainability; (iii) identifying potential macro-market linkages in the context of its financial markets monitoring; and (iv) assessing financial sector risks, taking into account possible implications for the ESM's function as the common backstop for the Single Resolution Fund, the latter of which plays a central role in the EU for resolving failing banks. These and other activities will benefit from efforts to identify and draw on relevant external data and analytical sources that could support ESM analysis as well as enhanced collaborations with external bodies on climate risk to, as appropriate, exchange knowledge and best practices.

FLAR is currently analysing how to address the topic of climate change internally by looking at, as a reference, the IMF and other peer international financial institutions. Even though FLAR does not have a regular framework for surveillance and consultation, it conducts informal and non-regular exchanges of views and dialogue with the IMF regarding topics of common interest. The impact of climate change on FLAR's region is one of them.

The AMF is carrying out research and developing guidelines for members in the field of climate risk and financial stability. In this context, it is doing a comprehensive assessment on the role of ESG factors in investment decisions of Arab pension funds to help deepen their integration and more closely link the decisions to the sustainable development goals in the region. In addition, in 2020 the AMF issued general guidelines for central banks on how to deal with the implications of natural disasters and climate change on banking systems and financial stability and continues working on additional guidelines and regional principles on related issues.

Lending toolkit and policies

While no RFA has revised existing lending frameworks in response to climate change, some are reflecting on possible future steps to be better prepared as a regional safety net. In the context of lending, RFAs can support members by, among other actions, providing emergency financing or buffers in the face of climate shocks, incorporating climate-related elements in programme design, and supporting green investment, depending on the RFAs' mandates.

Due to its dual mandate of macroeconomic stabilisation and long-term development, the EFSD can address adverse effects from climate change through its existing toolkit.³⁴ Financial loans have been used flexibly in the past to assist countries confronted with short-term shocks, which may include adverse economic impacts of natural disasters. For instance, in 2010, the EFSD extended a financial loan to Tajikistan following a landslide to avoid that the catastrophe would escalate into a budget crisis. Through its infrastructure investment loans and social grants, the EFSD helps countries modernise critical public infrastructure, including sectors that have direct links with the climate agenda. For example, the EFSD is supporting key clean energy generation projects in recipient states, such as recovery of hydropower plants. Such projects contribute to transitioning away from fossil fuels, respond to energy output challenges, and ensure that citizens receive affordable utilities on a permanent basis. Considering that the EFSD region is exposed significantly to natural disasters and drawing from the experience with the pandemic response, the Eurasian RFA is considering further tailoring its toolkit to introduce a special financing instrument that may better support rapid financial needs. The EFSD is also starting to think about how to incorporate climate and ESG issues into

³⁴ For information on the EFSD's dual mandate, see Ulatov et al. (2019).

its conditionality setting. As a first step, it will consider enhancing financial and banking sector reporting standards and practices, and data availability.

The EU MFA is used to promote more sustainable and inclusive growth. Managed by the European Commission, MFA provides financial support through loans or grants to EU partner countries experiencing a balance of payments crisis, conditional on economic and structural adjustments. This gives the EU leverage to encourage important structural reforms intended to put the recipient country's economy on a sustainable growth path. As is increasingly becoming clear, climate challenges are of macro-critical nature. The associated policy conditionality of MFA can thus help encourage changes to the regulatory framework or the design of labour markets/social safety nets facilitating the necessary transition. While the EU has other programmes that may deal with these issues more directly, MFA's policy leverage gives it a complementary role.

The ESM is carrying out a review of its instruments in the evolving economic and policy landscape, including with regards to climate change. The review follows a mandate given by ESM governors at their annual meeting in June 2022 and is expected to be concluded by Q1 2024. The ESM aims to assess the adequacy of the current instruments, and whether they are fit for purpose or possible optimisations should be considered. The review will explore how ESM instruments can help address climate risk, among other considerations.

In the cases of AMRO/CMIM and FLAR, climate change issues have yet to be discussed in relation to the RFAs' future lending programmes. The existing credit lines could incorporate aspects arising from climate-related shocks to the extent that they have a macroeconomic impact on the balance of payments of FLAR's and AMRO's/CMIM's member economies, while the investment needs are being addressed by multilateral development banks active in their respective regions.

Capacity building initiatives

The RFAs are taking steps to address members' climate-related capacity development needs and build up their own capabilities. Macrofinancial risks due to extreme climatic trends and supporting the financial sector's social responsibility are relatively new topics that interact with policy areas outside the area of expertise of regional safety nets, and to some extent their shareholders. As such, the RFAs and their members may have gaps in their capacities. RFAs are trying to close this gap by engaging with other institutions and experts and disseminating information across their membership through various channels.

FLAR has been promoting a dialogue on climate change and social responsibility with world-class experts and regional authorities. It prepared an event on the sustainable investment of international reserves and ESG ratings targeted at regional central banks' mid-career staff. Chile, FLAR's newest member country, has been a pioneer in the region in issuing green bonds while Uruguay is working on green bonds linked to environmental performance indicators regardless of the subsequent destination of the funds. In addition, as part of FLAR's efforts to scale up its support to members in addressing climate challenges, FLAR joined the NGFS as an observer and participates in workstreams on scenario design and analysis, net-zero for central banks, nature-related risks, and capacity building and training task force.

AMRO is leveraging on its partners to explore possible ways of building up its own in-house capacity. In June 2022, it held a discussion with Asia Research & Engagement, an organisation that undertook a climate risk survey of leading Asian banks and found that they are significantly behind the curve in aligning practices with national and global climate goals. In addition, AMRO has joined the NGFS' capacity building and training task force and will be advising on, and helping to deliver, climate risk-related training programmes and courses in

the region.³⁵ AMRO is also establishing a partnership with the Public and Third Sector Academy for Sustainable Finance, and with the World Bank, to develop climate risk and sustainable finance training programmes and capacity to deliver technical assistance to its members. Furthermore, AMRO is collaborating on climate risk issues with the OECD and jointly hosted a session on the role of central banks and finance ministries in greening the economy in Southeast Asia as part of the OECD's Forum on Green Finance and Investment in October 2022. A joint AMRO–OECD climate-risk conference that looks at how the ASEAN+3 financial sector has been progressing on climate change mitigation is being planned. AMRO remains open to receiving requests from its members for technical assistance and training on climate risk-related issues and is willing to work with ASEAN countries to build consensus towards a regional climate risk taxonomy, including the possibility of broadening coverage to include China, Japan, and Korea.

The ESM is taking several steps geared toward enhancing its own climate capacity. The euro area rescue fund, like FLAR and AMRO, has become an observer in the NGFS. As a major issuer and investor, the ESM will be able to contribute to the development and promotion of best practices aimed at greening the financial system. Showing its commitment to ESG initiatives, the ESM is participating as an observer in the European Commission Platform on Sustainable Finance, which assists the European Commission in further developing the EU taxonomy. The institution is also looking to leverage the knowledge of other partners such as the IMF to enhance its analysis on how climate-related risks affect economic developments and financial stability in the euro area. In this context, in cooperation with the A Dynamic Economic and Monetary Union, it organised a seminar in Q4 2022 on long-term challenges to fiscal sustainability, including from climate change, and the methodological implications for debt sustainability analysis frameworks.

The EFSD is working to strengthen its internal expertise on climate issues in addition to supporting members. In this context, it is recruiting environmental and social specialists to cover the infrastructure investment agenda and considers addressing climate change topics through the provision of tailored trainings and/or technical assistance, a new instrument launched by the RFA in 2022.

The AMF is expanding its training programmes to cover issues related to climate risk to support members and help build a sustainable financial sector across the Arab region. As part of its capacity building activities, it has created several dedicated training sessions on climate-related financial risks, green finance, and investment policies that meet ESG standards. Furthermore, the AMF in cooperation with Arab governments and a number of regional and international partners, is fostering regular dialogues among policymakers through high-level workshops, meetings, and peer-to-peer learning programmes, including on the circular carbon economy, among other topics.

Internal policies and operations

The rising awareness of climate change challenges and ESG reflections has encouraged some RFAs to lead by example and revise internal policies and processes. The reviews follow best practices and aim to, among other goals, support social and environmental responsibility through various activities.

The ESM has identified ESG and climate change as one of its strategic priorities, on the back

³⁵ AMRO has also joined the Workstreams on Scenario Design and Analysis, and Monetary Policy.

of several actions in recent years that demonstrated its commitment to sustainability. For instance, the ESM has been investing in green and sustainable bonds since 2014 and in 2020, it became a signatory of the UN-backed Principles for Responsible Investment that is recognised as the leading global network for investors committed to integrating ESG considerations into their investment practices and ownership policies. As such, the ESM has made ESG considerations an essential aspect of its investments by regularly reporting on its activities and applying responsible principles to the management of its assets, in particular its €80.5 billion of paid-in capital. Investors are increasingly interested in possible ESG-related characteristics of ESM bonds, so the ESM developed a social bond framework compliant with the International Capital Market Association social bond principles. The ESM is also an active member in the association's Social Bond Working Group, contributing to the work of the subgroups on Climate Transition Finance and Survey and Promotion. Putting words into action, the ESM is committed to using resources sustainably in its daily operations and, since 2019, it has published a yearly Carbon Footprint Report providing a comprehensive account of the carbon emissions arising from ESM's operations. To guide, coordinate, and promote ESG workstreams within the institution at management level, the ESM has created a strategic steering group.

Other RFAs are similarly developing best practices for integrating climate aspects in their internal operations. FLAR's assets and liability committee decided to apply guidelines for observation and exclusion of companies of the Norwegian Pensions Fund to its portfolio and those managed by external portfolio managers. The purpose of observing the guidelines is to avoid that it is invested in companies that cause or contribute to serious violations of fundamental ethical norms, as defined by the Norway's funds Guidelines. As these companies may be subject to more tail risks, the expectation is that their exclusion may lead to lower risks in the investment portfolio. The EFSD is developing its Environmental and Social Policy for sovereign infrastructure loans that aims at enhancing potential positive environmental and social effects in planning and implementing investment projects, while ensuring that these contribute to sustainable development. A theoretical environmental impact assessment of EFSD's planned investment activities should contribute to promoting a more efficient use of natural resources and protecting the environment in recipient countries. The European Commission, in turn, supports environmental sustainability and ESG initiatives for EU support programmes to increase sustainable investments. One prominent example is the InvestEU Programme which offers risk-sharing to financial institutions when financing investments in the EU. Project promoters and financial institutions have to both make sure that investments do not harm the environment and report on the climate and environmental impact of their investments. The AMF is investing in the green bond market in the region and globally, and has defined a framework for identifying, monitoring, and reporting the sustainability and ESG profile of its internal investments using a positive screening approach.

5. Conclusions and considerations

Climate change, and the process of decarbonisation necessary to stabilise global temperatures, will confront countries with major macroeconomic and financial policy challenges in decades to come. Policymakers will need to balance climate investment needs, ensure policy space to tackle future shocks, and continue delivering on other developmental priorities, as appropriate. Like the Covid-19 pandemic, the climate crisis crosses geographic and economic borders and will require multilateral cooperation and a strong international response as countries adapt and build resilience to climate impacts. The just transition to a greener economy will also require the creation of opportunities for displaced workers and that affected households are protected.

Despite heterogeneous exposures to climate-related risks, no RFA region will be spared. The total number of climate-related disasters in RFA regions has more than quadrupled between 1980 and 2021, with ASEAN+3 recording the highest number of extreme-weather catastrophes. The disasters are already causing major economic damages in RFA regions, in addition to human and social ones. Composite indices that capture global climate change risk patterns demonstrate that all RFA regions are vulnerable to climate change. ASEAN+3 economies appear most exposed to climate-driven hazards as do several countries in the AMF and FLAR regions, while the euro area displays relatively less exposure. Transition risks, for their part, are more apparent in the case of several fossil fuel exporting countries in the AMF region. There is strong intra-regional variation with regards to physical and transition risks, reflecting the heterogeneity observed at the country level in terms of geographic conditions, economic sectors of importance, and level of development.

The RFAs have started, in varying degrees, internalising climate considerations into their operations, to be better prepared to assist members in their fight against climate change. The efforts by RFAs focus on developing internal expertise and analytical tools, incorporating climate change and sustainability aspects in existing policies and frameworks, exploring possible toolkit enhancements, and disseminating climate-related information across their memberships. In addition, they have stepped up their engagement with key stakeholders with expertise on climate issues, exploiting comparative advantages. The RFAs have benefitted in this context from a wealth of initiatives on macrofinancial climate-related issues that have been launched in recent years at the global and regional levels. Among other examples, several RFAs have become observers in the NGFS and co-organised events with other institutions.

Consideration 1: RFAs should continue leveraging on multilateral cooperation to address climate change

The RFAs should intensify their collaboration with the IMF to create synergies. The regional funds could draw lessons from the IMF's work on climate risk analysis, contributing to having more consistent methodologies and tools, to the extent feasible and useful. Informal workshops amongst the RFAs and the IMF focused on selected topics of common interest could be held to disseminate knowledge within the IMF–RFA network. The inter-institutional dialogue could open ways to finding complementarities when supporting members. For instance, the IMF could leverage on the RFAs' close relationship with member authorities to advance best practices on, among other items, the design of climate strategies. Finally, it would be worthwhile to explore if and how RFAs could contribute to the successful implementation of the RST, including by helping mobilise additional official and private climate finance.

The RFAs should also seek to deepen their engagement with stakeholders beyond the Global Financial Safety Net. The climate risk scenario analyses by the Financial Stability Board and the NGFS are key inputs for the RFAs' analysis on climate change impacts in their own regions

under possible futures. The work of these groups on improving the climate data infrastructure is equally relevant for RFAs given that consistent, comparable, and reliable data is of paramount importance when conducting risk analysis. The RFAs should moreover stay abreast of policy discussions at the Financial Stability Board and G20 that may result in common approaches on climate issues across jurisdictions. In addition, the RFAs could work with MDBs to help countries achieve climate objectives and ensure a more sustainable, low-carbon economy. MDBs can contribute to RFAs' members greater macroeconomic stability in various ways. For instance, MDBs are leaders in helping low- and middle-income countries make necessary structural adjustments through investment projects, while mobilising additional private capital to that end, and can be important sources of countercyclical lending following a climate-related shock.

Consideration 2: RFAs could review their lending toolboxes to help in addressing climate-related risks

Significant financial resources globally will need to be mobilised including, where appropriate, from the Global Financial Safety Net, to successfully tackle climate change. In the coming years, governments need to invest in climate adaptation and mitigation and build fiscal space to accommodate possible future climate-related shocks. The latter is particularly relevant given that insurance coverage related to weather disasters is often limited, including in most countries of interest in this study, and will likely only offer partial financial respite.

The RFAs could assess whether they can play a role, within the remit of their mandates, in closing financing gaps or helping mobilise resources beyond what may be feasible for the RFAs already. This could require amending lending toolkits and policies in a way that it would allow the RFAs to respond more directly to the acute needs of their membership. Possible ideas for reflection include, enhancing emergency instruments to provide quick financing in response to an economic shock caused by a climatic disaster, evaluating options to support the mobilisation of affordable climate financing needed for longer-term macro-critical objectives, helping to address insurance gaps for extreme climate events through the provision of precautionary credit lines, acting as a regional sovereign backstop for the banking sector, and integrating climate policies in programme design to incentivise reforms aligned with the Paris Agreement objectives.

Consideration 3: RFAs could become important regional centres of information for their members on macrofinancial aspects of climate change

Lastly, to the extent feasible and respecting the competences of other stakeholders in their regions, the RFAs could look for ways to disseminate knowledge across their membership. Countries will not necessarily have all the answers or technical capabilities to address climate-related policy challenges. The RFAs could support them by facilitating a flow of information covering, for example, the latest research on how to manage physical and transition risks, emerging trends in green finance, and environmental taxonomies. The sharing of information should be tailored to the needs of countries in their region and could take many forms, from organising conferences and workshops and providing technical assistance to members that may request it, to developing digital platforms that collect insights on climate change as the RFAs' own expertise in this field grows.

The steps taken by the RFAs so far to enhance their readiness in view of the climate crisis are but the start of what will likely be a multi-year process. The RFAs should strive to have a candid dialogue with shareholders to better understand how they could best support them

and assess their openness for possible future reforms. There will be scope for peer-learning, as the institutions of the global and regional layers of the Global Financial Safety Net continue to gradually build up their capacities. The regular dialogues amongst the RFAs and with the IMF will remain an important platform to share insights with each other that, as was the case during the Covid-19 pandemic, will underscore once more the value of the IMF–RFA network.

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Online databases and data sources

Emergency Events Database (EM-DAT) (as of August 2022): <https://public.emdat.be/>

IMF World Economic Outlook Database (April 2022): <https://www.imf.org/en/Publications/WEO/weo-database/2022/April>

IMF Climate Change Indicators Dashboard (as of August 2022): <https://climatedata.imf.org/>

OECD Carbon dioxide emissions embodied in international trade (2021): https://stats.oecd.org/Index.aspx?DataSetCode=IO_GHG_2021

World Bank Global Financial Development Database (November 2021): <https://www.worldbank.org/en/publication/gfdr/data/global-financial-development-database>

Annex

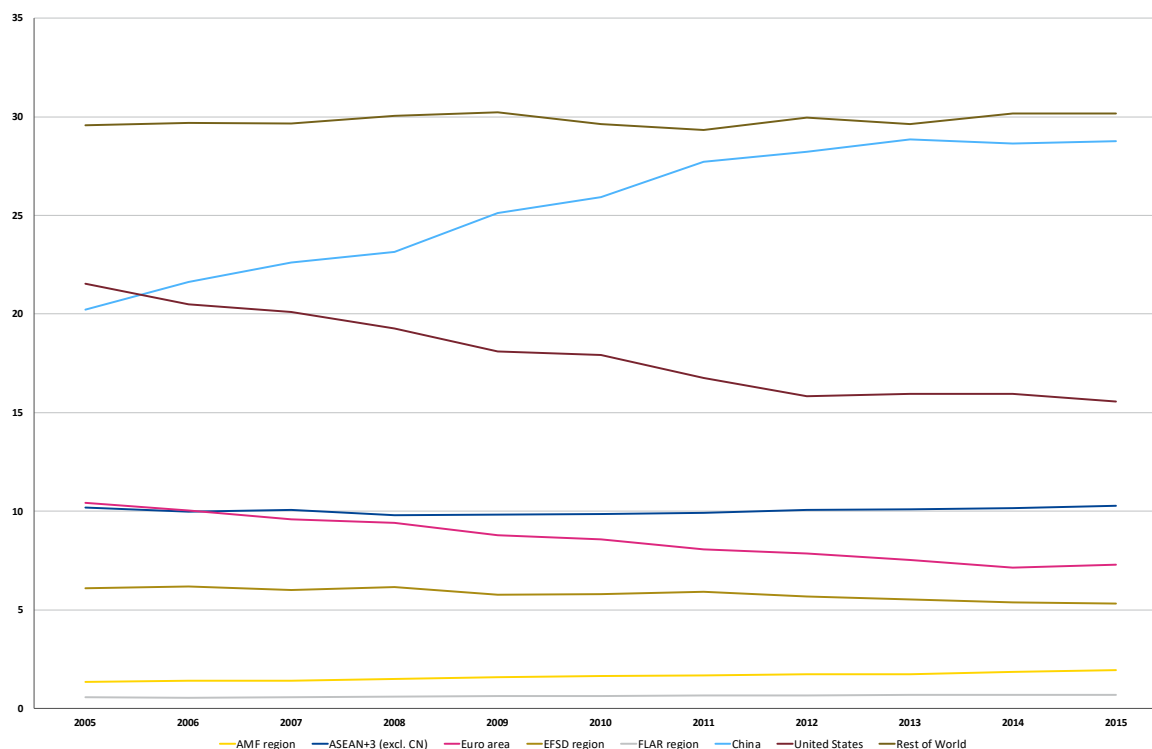
Table A.1
Region labels and country coverage

Region label	RFA	RFA members/countries
AMF region	AMF	Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, UAE, Yemen
ASEAN+3	AMRO/CMIM	Brunei Darussalam; Cambodia; Indonesia; Lao PDR; Malaysia; Myanmar; Philippines; Singapore; Thailand; Vietnam; China; Hong Kong, China; Japan; Korea
Euro area	ESM	Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, Spain
EFSD region	EFSD	Armenia, Belarus, Kazakhstan, Kyrgyz Republic, Russia, Tajikistan
MFA beneficiaries	MFA	2020 Covid-19 MFA package beneficiary countries: Albania, Bosnia and Herzegovina, Georgia, Jordan, Kosovo, Moldova, Montenegro, North Macedonia, Tunisia, Ukraine
FLAR region	FLAR	Bolivia, Chile, Colombia, Ecuador, Peru, Venezuela, Costa Rica, Uruguay, Paraguay

Note: The regional labels and corresponding country coverage follow the definitions applied in the previous joint RFA staff project (Schiliuk et al., 2021). Chile became a member of FLAR in 2022 and has therefore been added to the group of countries part of the FLAR region in the current study.

Source: Authors' elaboration

Figure A.1
Carbon dioxide emissions embodied in global production
 (in % of global emissions)



Sources: OECD Trade in embodied carbon dioxide database, authors' calculations

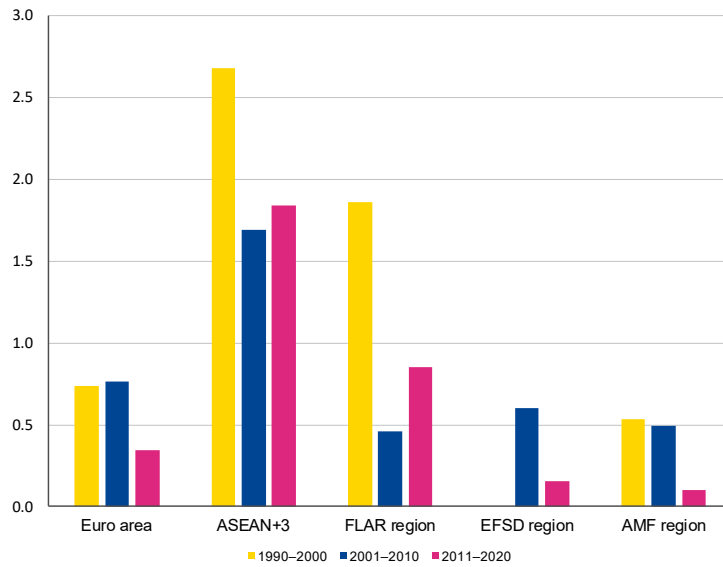
Table A.2
Largest two climate-related disasters per RFA region by total damages to GDP, 2000–2021

Year	Disaster type	Country	Region	Damages to GDP (in %)
2005	Storm	Latvia	Euro area	1.9
2002	Flood	Austria	Euro area	1.1
2021	Drought	Somalia	AMF region	13.4
2007	Storm	Oman	AMF region	9.3
2008	Storm	Myanmar	ASEAN+3	15.7
2011	Flood	Thailand	ASEAN+3	10.8
2007	Drought	Moldova	MFA beneficiaries	9.2
2000	Drought	Georgia	MFA beneficiaries	6.4
2008	Extreme temperature	Tajikistan	EFSD region	16.4
2000	Drought	Tajikistan	EFSD region	5.8
2007	Flood	Bolivia	FLAR region	3.8
2008	Flood	Ecuador	FLAR region	1.6

Notes: The ratio compares unadjusted economic damages to nominal GDP in the year the reported natural disaster started. Only events for which data on damages was available are considered. Some disasters take longer than 12 months. The costs beyond the first year are not considered when calculating the ratio.

Sources: EM-DAT, IMF WEO April 2022, authors' calculations

Figure A.2
Total damages to GDP from climate-related disasters
 (in % of region GDP)

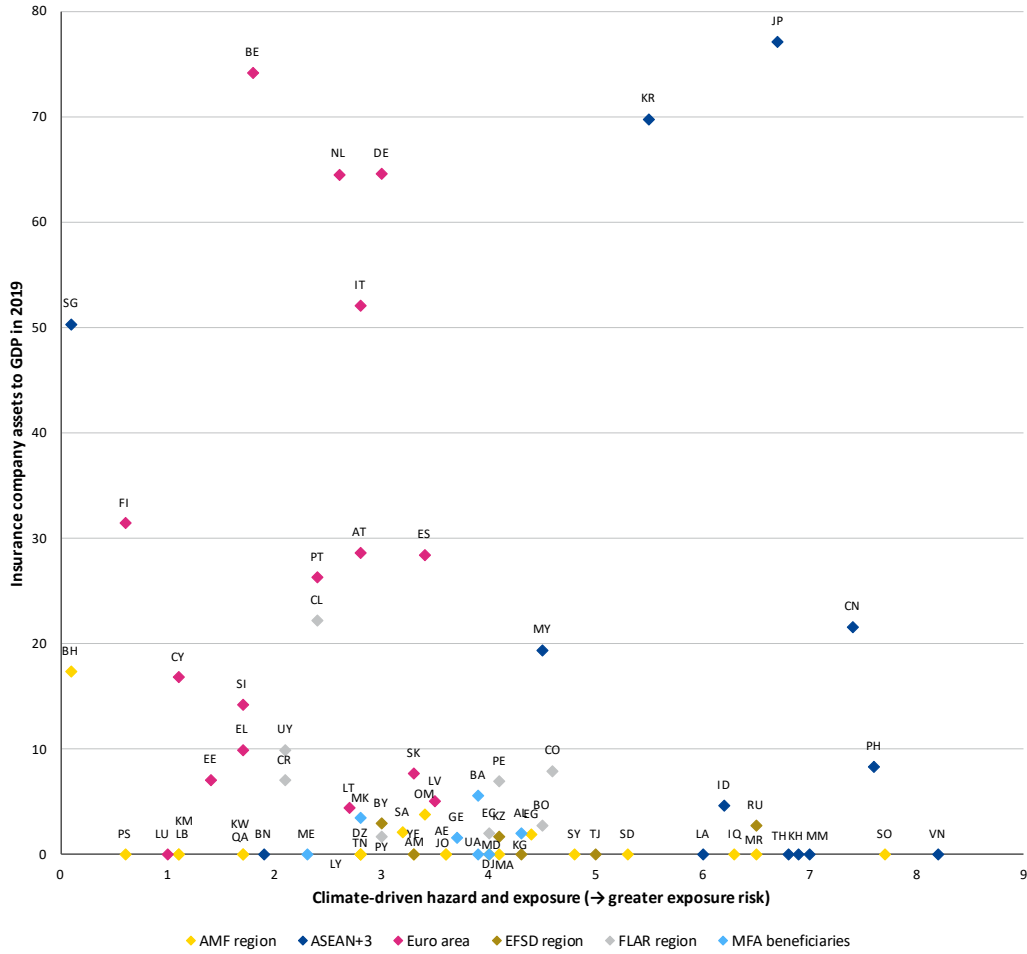


Notes: The ratio compares the total unadjusted economic damages to the region's nominal GDP in each decade. Only events that correspond to the six types of climate-related disasters reported in Figure 2 are considered.
 Sources: EM-DAT calculations, IMF WEO April 2022, authors' calculations

Figure A.3

Size of the insurance sector and exposure to climate driven hazards

(y-axis in % of GDP; left axis as index, x-axis as index of physical risk exposures, scale 0-10)



Sources: EM-DAT, Global Financial Development Database, authors' calculations

Acronyms

AMF	Arab Monetary Fund
AMRO	ASEAN+3 Macroeconomic Research Office
ASEAN+3	Association of Southeast Asian Nations + China, Japan, and Korea
CMIM	Chiang Mai Initiative Multilateralisation
EBRD	European Bank for Reconstruction and Development
ECB	European Central Bank
EFSD	Eurasian Fund for Stabilization and Development
EM-DAT	Emergency Events Database
ESG	Environmental, social, and governance
ESM	European Stability Mechanism
EU	European Union
FLAR	Latin American Reserve Fund
GDP	Gross domestic product
G7	Group of Seven
G20	Group of Twenty
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
MDB	Multilateral development bank
MFA	Macro-financial assistance (EU)
NGFS	Network of Central Banks and Supervisors for Greening the Financial System
OECD	Organisation for Economic Co-operation and Development
RFA	Regional financing arrangement
RST	Resilience and Sustainability Trust
USD	United States dollar