



Independent Evaluation Office
of the International Monetary Fund

BACKGROUND PAPER



BP/22-01/05

The IMF's Engagement on Natural Disasters and Climate Change Issues Affecting Small Developing States

Domenico Lombardi and Cyrus Rustomjee

IEO Background Paper
Independent Evaluation Office
of the International Monetary Fund

The IMF's Engagement on Natural Disasters and Climate Change Issues
Affecting Small Developing States

Prepared by Domenico Lombardi* and Cyrus Rustomjee†

March 30, 2022

The views expressed in this Background Paper are those of the author and do not necessarily represent those of the IEO, the IMF, or IMF policy. Background Papers report analyses related to the work of the IEO and are published to elicit comments and to further debate.

*Consultant, Independent Evaluation Office of the IMF.

†Assistant Director, Independent Evaluation Office of the IMF.

Contents	Page
Abbreviations _____	v
Executive Summary _____	vi
I. Introduction _____	1
II. Context _____	2
III. Research Review _____	7
A. External Literature _____	7
B. IMF Research _____	9
IV. IMF Guidance on Managing Vulnerabilities to Natural Disasters and Climate Change _____	12
A. Specific Guidance on SDS Engagement _____	12
B. The Overall Surveillance Framework _____	16
C. The Lending Framework _____	18
V. IMF Surveillance _____	22
A. Review of Country Experience _____	22
B. Overall Assessment _____	30
VI. IMF Financial Support _____	30
A. Experience with Emergency Financing _____	31
B. Program Lending _____	37
VII. Disaster Resilience Strategies _____	41
VIII. Conclusions _____	44
 Boxes	
1. Climate Change Policy Assessments _____	15
2. Evolution of Access Policy in Emergency Financing _____	20
3. Managing Natural Disaster Vulnerability Through Disaster Resilience Strategies _____	42
 Figures	
1. Natural Disasters in SDS by Type, 2000–2020 _____	3
2. IMF Emergency Financing for SDS NDs > 10 percent of GDP (1979–2020) _____	35
 Tables	
1. Incidence of Natural Disasters, 1960–2020 _____	3
2. SDS and Non-SDS—Damage to GDP From Natural Disasters, 1960–2020 _____	4
3. Regional Distribution of Natural Disasters in SDS, 1950–2020 _____	5
4. Top 10 Natural Disasters Since 2000, by Share of Population Affected _____	6
5. Synopsis of IMF Policy Guidance on Natural Disasters and Climate Change in SDS _____	16

6. Emergency Financing Access Under the RFI and RCF, 2009–2020 _____	21
7. List of Countries Assessed _____	23
8. Surveillance Heat Map—Total Scores _____	25
9. SDS Emergency Financing and Fund-Supported Programs, 2000–June 2021 _____	31
10. IMF Financing for Natural Disasters in SDS: 1979–2020 _____	32
11. Emergency Financing for SDS: Scale of Damages and Fund Financing, 2011–2019 _____	33
12. Natural Disaster and Climate Change Components in IMF Programs _____	39
Annexes	
I. SDS' Vulnerability by Type of ND _____	48
II. Review of ND Emergency Financing Documents _____	49
III. Additional Tables _____	50
IV. Supplementary Figure _____	57
References _____	58

ABBREVIATIONS

AFR	African Department (IMF)
APD	Asia and Pacific Department (IMF)
BOP	Balance of Payments
CC	Climate Change
CCPA	Climate Change Policy Assessment
DSA	Debt Sustainability Assessment
DRS	Disaster Resilience Strategy
ECCU	Eastern Caribbean Currency Union
ECF	Extended Credit Facility
EF	Emergency Finance
EFF	Extended Fund Facility
ENDA	Emergency Natural Disaster Assistance
EPCA	Emergency Post-Conflict Assistance
EM-DAT	International Disaster Database
ESF	Emergency Shocks Facility
EUR	European Department (IMF)
GDP	Gross Domestic Product
GRA	General Resources Account
IPCC	International Panel of the UN on Climate Change
LIC	Low-Income Country
LND	Large Natural Disaster
MCD	Middle East and Central Asia Department (IMF)
ND	Natural Disaster
ND&CC	Natural Disaster and Climate Change
PCI	Policy Coordination Instrument
PFM	Public Financial Management
PRGF	Poverty Reduction and Growth Facility
PRGT	Poverty Reduction and Growth Trust
PSI	Policy Support Instrument
RAM	Risk Assessment Matrix
RCF	Rapid Credit Facility
RFI	Rapid Financing Instrument
SCF	Standby Credit Facility
SDS	Small Developing State
SGN	Staff Guidance Note
SPR	Strategy, Policy and Review Department (IMF)
UCT	Upper Credit Tranche
UN	United Nations
WEO	World Economic Outlook
WHD	Western Hemisphere Department (IMF)

EXECUTIVE SUMMARY

This paper reviews the Fund's core activities—in particular, including surveillance and lending, programs and emergency assistance—to appraise how well the Fund served Small Developing States (SDS) with regard to managing vulnerabilities from natural disasters and climate change (ND&CC), between 2010 to 2020.

SDS face significantly higher natural disaster (ND) risks than the rest of the IMF membership due to their geographical location and small size, which preclude diversification against location-specific shocks. Climate change has exacerbated the impact and frequency of NDs by affecting average climate conditions and their variability, resulting in more intense and frequent disasters and adding pressure on ecosystems. In recent decades, SDS have experienced a higher share of large NDs than bigger countries, with increasing frequency. In particular, SDS experienced a persistently higher share of the most severe disasters, with damage greater than 20 per cent of GDP and since 2000, 6 of the world's 10 largest disasters in terms of population affected occurred in SDS.

During the evaluation period, IMF research, analysis and policy advice paid increasing attention to the macroeconomics of NDs and recovery, the impact on growth, and the need for resilience-building and disaster preparedness. Building on a growing body of research, both outside and inside the Fund, the 2017 Staff Guidance Note emphasized the need to assess the macro criticality of ND&CC and encouraged use of new tools to integrate ND&CC effects in SDS' macroeconomic frameworks. In particular, Climate Change Policy Assessments (CCPAs) and country-owned disaster resilience strategies (DRS) have provided the basis for careful country-level assessment and policy advice on ND&CC issues. CCPAs provided for six SDS members helped strengthen surveillance of the impact of ND&CC, built a critical mass of knowledge facilitating policy analysis, offered a structured tool for collaborating with partners, and helped incorporate disaster preparedness and resilience building into the Fund's advice. DRS prepared for two SDS enabled development of a framework for building resilience and costing resources needs, although the financial follow-through was limited. However, treatment of ND&CC issues was uneven across SDS as surveillance in countries that lacked a CCPA or DRS typically did not incorporate the impact of ND&CC effects nearly as thoroughly.

While few SDS used the IMF's emergency facilities (EF) prior to the evaluation period, the number of uses increased substantially over 2010–2020, with a higher proportion of severe ND events supported by Fund's emergency ND facilities. Moreover, higher amounts drawn covered a larger share of ND damages. Increases in annual and cumulative access limits were important contributing factors. Still, many SDS did not utilize EF, some despite facing large NDs. Reasons included stigma, availability of alternative sources of financing, perceived high administrative burdens in drawing Fund EF, and SDS' small quotas, which can result in the Fund providing a relatively small share of high post-disaster financing needs.

Less attention was paid incorporating ND&CC issues into upper credit tranche programs to encourage longer-term ND&CC resilience building, notwithstanding the knowledge generated by the substantial research and policy analysis developed by the Fund to better understand and support SDS in surveillance work. Programs tended to become more explicit about the appraisal of ND&CC vulnerabilities in the latter part of the evaluation period, including in debt sustainability assessments. However, program conditions generally did not include specific and direct reference to ND&CC. Going forward, longer-term lending under the new Resilience and Sustainability Trust being developed as this paper was being completed should provide the opportunity to pay more systematic attention to ND risks and resilience needs in program design and conditionality.

In concluding, the Fund has effectively pioneered important work to provide analysis and policy advice related to the macro critical issues raised by ND&CC with a selected group of SDS with which it has collaboratively developed innovative products, including the CCPA, intensively. Notably it has set best practice standards, and it has worked with country officials to innovate on the ground. Looking forward, the challenge is to build on success with these “champions” by mainstreaming these approaches among SDS and in particular to applying those relevant tools and expertise more broadly, particularly in lending to support policies and financing to achieve greater resilience to ND&CC.

I. INTRODUCTION¹

1. The IMF membership includes 34 small developing states (SDS) with a population of less than 1.5 million, excluding advanced economies and fuel exporting countries. Of these, 27 are island states, 5 coastal, and 2 landlocked, while 15 are microstates with a population of fewer than 200,000 inhabitants (IEO, 2020a).
2. In recent years, the IMF has increasingly acknowledged specific features of SDS economies in its engagement with these members. One of the most important of these is that SDS experience significantly higher risks from natural disasters and climate change (ND&CC) than other countries. Given their location and small size, which precludes diversification to protect against location-specific shocks, SDS are impacted to a larger extent by natural disasters (NDs), particularly meteorological events such as tropical storms and hurricanes. They tend to be more vulnerable also to climate change (CC), as the latter exacerbates the impact and frequency of NDs and generates added pressure on ecosystems through, for instance, rising sea levels (IMF, 2016; UN, 2009; Nurse and others, 2014).
3. Against this backdrop, this paper contributes to the IEO's Evaluation of the IMF's Engagement in Small States by focusing on the Fund's role on ND&CC issues affecting SDS. The paper reviews how ND&CC were treated in the Fund's core activities—particularly including surveillance and lending, programs and emergency assistance—in the evaluation period 2010–2020 and how well IMF engagement on ND&CC served SDS.
4. This paper focuses on climate-related and geological NDs. Natural disasters are typically classified into five types: (i) meteorological events, which include storms and extreme temperature events; (ii) hydrological (floods and landslides); (iii) climatological (droughts and wildfires); (iv) geophysical (earthquakes and volcanoes); and (v) biological (epidemics and insect infestations). A common feature of the first four of these categories is that they result in heavy physical damage to infrastructure, while the frequency and impact of the first three are affected by CC. All subsequent references in the paper to natural disasters or “ND” therefore refer to meteorological, hydrological, geophysical and climatological NDs, or to “physical natural disasters” only, unless specifically indicated. A separate background paper (Maret, 2022) considers the IMF's engagement with SDS in responding to the COVID-19 pandemic.
5. This paper draws on data from the International Disaster Database (EM-DAT), produced by the Centre for Research on the Epidemiology of Disasters (CRED). CRED has documented the incidence and type of NDs that have occurred in all countries since 1950, with data becoming

¹ The authors thank Charles Collins and Miguel de Las Casas for very helpful comments on previous, preliminary drafts, Alisa Abrams and Yishu Chen for precious help with documents and data, respectively, and Arun Bhatnagar for excellent editing assistance. Any errors or omissions are the authors' sole responsibility.

more complete from 1960.^{2, 3} By end–2020, the CRED database did not include any NDs arising as a result of the COVID-19 pandemic. Consequently, all data in this paper related to the incidence, scale and frequency of NDs excludes any NDs due to the COVID-19 pandemic. Not all recorded events include complete information, for example, on the amount of damages incurred (USD million) as well as information on the number of people affected. Where relevant, the sections below utilize data based on this somewhat narrower dataset.

6. The analysis developed in the paper relies on IMF policy documents and other relevant material, including the six IMF and World Bank Climate Change Policy Assessments (CCPAs) and the two Disaster Resilience Strategies (DRS). Further evidence has been gathered through interviews with senior officials familiar with IMF advice and with key staff in charge of work on SDS and from country case studies from the SDS Evaluation. This paper also draws from the IEO's previous work, such as, for instance, an evaluation of Fund collaboration with the World Bank on macrostructural issues, including climate (IEO, 2020b); and an evaluation of the Fund's work on fragile countries—some of them SDS (IEO, 2018).

7. The paper is structured as follows. Section II provides context to this paper by documenting the vulnerability of SDS to ND&CC. Section III reviews the relevant academic literature as well as the Fund's own research. Building on that, Section IV summarizes the IMF's approach to assessing SDS vulnerabilities and the resulting policy guidance in regard to the overall surveillance framework and the framework for lending. Then, Sections V to VII assess IMF surveillance, programs and emergency assistance, and DRS, respectively. Finally, Section VIII concludes.

II. CONTEXT

8. Between 1960 and 2020, CRED recorded 13,359 NDs, excluding biological NDs, of which 481 (3.6 percent) occurred in 33 SDS.^{4, 5} (Table 1). NDs have become more frequent since the 1960s. For example, while 79 ND events were recorded for SDS members (non-SDS: 1,550) in the 1980s, the number grew to 120 NDs (non-SDS: 3,738 NDs) in the period 2000–2009. During the evaluation period 2010–2020, 124 ND events were recorded in SDS, representing 3.3 percent of all NDs during this period.

² EM-DAT distinguishes between two generic categories for disasters: natural and technological. It divides the ND category into the 5 abovementioned sub-group (viz.: meteorological, hydrological, geophysical, climatological and biological), which in turn cover 15 disaster types and more than 30 sub-types. For a disaster to be entered into the database at least one of the following criteria must be fulfilled: (i) Ten or more people reported killed; (ii) a hundred or more people reported affected; (iii) a state of emergency has been declared; or (iv) there has been a call for international assistance. See <https://www.emdat.be/>.

³ Since 1980, Munich Re has provided a similar source of data on ND events and climate change, although data is from 1980. See <https://www.munichre.com/>.

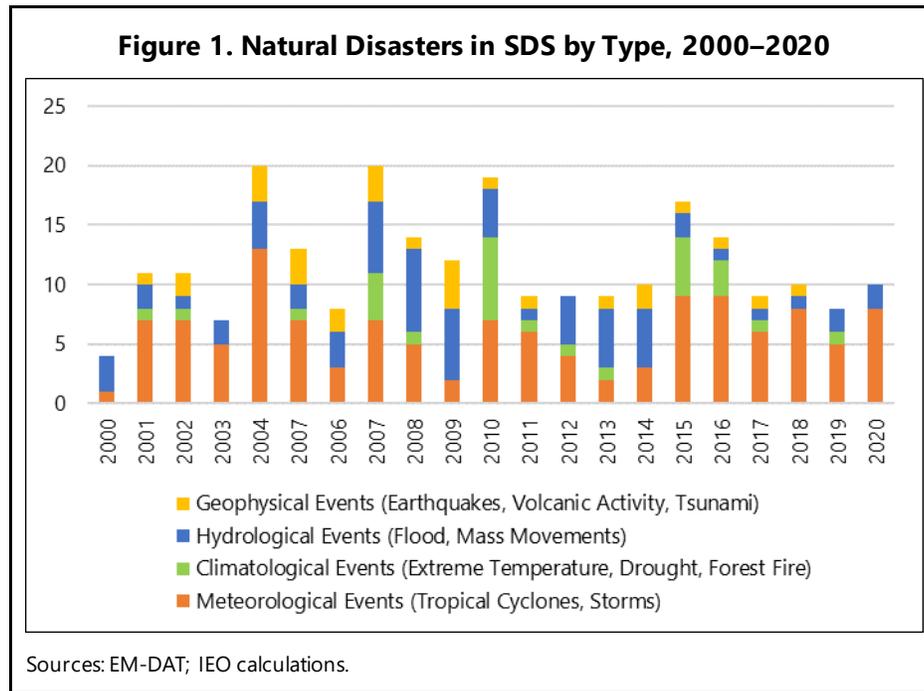
⁴ The EM-DAT database identifies all SDS as having experienced an ND, except Nauru.

⁵ Including biological disasters, there were 14,923 ND events between 1960–2020, of which 528 (3.5 percent) occurred in 33 SDS.

	1960–1969	1970–1979	1980–1989	1990–1999	2000–2009	2010–2020	Total
Non-SDS	538	806	1,550	2,489	3,738	3,757	12,878
SDS	27	41	79	90	120	124	481
Total	565	847	1,629	2,579	3,858	3,881	13,359

Source: International Disaster Database (EM-DAT).
Note: Excludes biological NDs.

9. The frequency of NDs in SDS has varied substantially year by year and by type (Figure 1). Meteorological events have been the most common type of ND event in SDS, representing 59 percent of all NDs over 1960–2020, comprising, almost exclusively, tropical storms. Other NDs have been hydrological events, almost exclusively floods (20 percent); climatological, (mainly droughts, 11 percent), and geophysical (mainly earthquakes, 10 percent). Approximately 80 percent of storms and floods occurred in SDS in APD and WHD, while SDS in APD have been most prone to geophysical events, with two-thirds of all earthquakes and volcanic events occurring in in APD. SDS in APD experienced 47 percent of all NDs. Other regions with a large share of ND events included WHD (34 percent) and AFR (14 percent). EUR and MCD accounted for 5 percent of NDs in SDS.



10. Adjusting for land area, NDs occur more frequently in SDS than in larger countries. SDS members experienced 528 NDs between 1960–2020, representing an average of 7.5 NDs a year for the group of 34 SDS. By comparison, a group of 8 countries, each with a land area similar to the total land area of all SDS combined, experienced 119 NDs over the same period, or 1.7 NDs

per year for this group.⁶ This high frequency in SDS reflects geographic location, as many SDS are located within the cyclone and hurricane belts close to the equator as well as zones prone to geophysical events.

Impact on GDP

11. In terms of GDP impact, SDS were much more vulnerable than non-SDS to almost all types of NDs (Annex I). Indeed, by this metric, SDS have experienced a high share of the most severe NDs that have occurred.⁷ Overall, 24 percent of NDs with damages between 5–10 percent of GDP occurred in SDS; 45 percent of those between 10–20 percent; 57 percent of those between 20–30 percent; and the same percentage of the most severe disasters with damages greater than 30 percent of GDP (Table 2).

	Damage/ GDP 0%–1% (Number)	Share (Percent) 3	Damage/ GDP 1%–5% (Number)	Share (Percent) 18	Damage/ GDP 5%–10% (Number)	Share (Percent) 24	Damage/ GDP 10%–20% (Number)	Share (percent) 45	Damage/ GDP 20%–30% (Number)	Share (percent) 57	Damage/ GDP 30%+ (Number)	Share (Percent) 57	IMF Member Share (Percent) 18
SDS	373	3	49	18	13	24	18	45	12	57	16	57	18
Non-SDS	12,572	97	222	82	41	76	22	55	9	43	12	43	82

Sources: EM-DAT; WEO; authors' elaboration.
Note: Damage/GDP indicates absolute number of episodes. ND share is in percent. Sample period: 1960–2020.

12. In 2017, the Executive Board agreed to establish a Large Natural Disaster (LND) window under the IMF's Rapid Financing Instrument (RFI) and the Rapid Credit Facility (RCF) with a 20 percent of damage-to-GDP as a threshold for eligibility to qualify for emergency financing under the LND Window of IMF's RFI and RCF LND window (see Section VI of this paper). SDS have experienced 28 ND events of this scale since 1960, including 5 events during the evaluation period,⁸ 7 between 2000–2009, and the remaining 16 between 1979–1999. Based on incidence of these adverse events over the past two decades, on average an LND could be expected to occur about once every two years among SDS members.

⁶ SDS have a combined land area of just over 577,000 km². Eight countries (Botswana, Central African Republic, France, Kenya, Madagascar, Somalia, Ukraine and Yemen) have land areas within +/-10 percent of this combined land area.

⁷ The analysis uses estimates of damages provided by EM-DAT. The World Bank also produces, in partnership with national authorities and international partners, periodic World Bank and Inter-Agency Post-Disaster Needs Assessments (PDNAs). During the evaluation period, 15 PDNAs were prepared for SDS⁷, including three for ND events for which the IMF approved ND emergency financing (Samoa (2012), St. Vincent and the Grenadines (2014) and Vanuatu (2015)). EM-DAT data has been supplemented in these cases by PDNA estimates.

⁸ The Bahamas (2019), Dominica (2017, 2015), Tonga (2020), and Vanuatu (2015).

13. SDS economies tend to be more vulnerable not just to NDs but also to CC. One-third of SDS, mainly low-lying island states, are highly vulnerable to CC, which exacerbates the impact and frequency of NDs, particularly in low-lying island states, as changing weather patterns have increased and rising sea levels heightened flooding risks (see Section III, IMF, 2016; UN, 2009; Nurse and others, 2014). As a result, the harmful effects of NDs, as well as their relative frequency, have risen compared to the previous decade. Moreover, smallness is associated with high building costs per capita, particularly in infrastructural outlays, thus reducing the ability to adapt to CC through infrastructures upgrades and redesign (Nurse and others, 2014).

14. Severe NDs affecting SDS are largely clustered in the Caribbean and Pacific member states (Table 3). Overall, between 1950–2020, 93 percent of NDs with damage of 5 percent or more of GDP that occurred in SDS affected these two regions. Since 2000, events of this scale of damage have been recorded only in these two regions, with 10 such events occurring during the evaluation period.

Table 3. Regional Distribution of Natural Disasters in SDS, 1950–2020

	1950–1999	2000–2009	2010–2020	Total Number	Total (In percent)
WHD	21	7	6	34	59
APD	13	3	4	20	34
AFR	4	0	0	4	7
EUR & MCD	0	0	0	0	0
Total	38	10	10	58	100

Sources: EM-DAT; WEO: Authors' calculations. Sample period: 1950–2020.

Note: Number of NDs with damage of 5 percent of GDP or greater.

Share of Population Affected

15. The destructive impact of NDs can be measured not only by the economic cost and scale of damage incurred, but also by the proportion of a country's population directly affected by the event. With populations concentrated in a small terrestrial area and with many SDS located in regions prone to hurricanes and weather-related shocks, when large NDs have hit, they have typically affected a larger share of the country's population than in non-SDS. Since 2000, 6 of the world's 10 largest disasters, ranked by population affected (including those deceased, injured, and left homeless), as a percentage of total population, have occurred in SDS, including 3 Pacific, 2 Caribbean and 1 African SDS. Impacts among their respective populations have been extraordinarily severe: in 4 cases, 90 percent or more of the population were affected (Table 4).

Table 4. Top 10 Natural Disasters Since 2000, by Share of Population Affected

Country	Year	Affected Population (In percent)	Type of Storm	SDS Y/N
St. Lucia	2010	100	Tropical cyclone	Y
Dominica	2017	100	Tropical cyclone	Y
Eswatini	2001	96	Drought	Y
Mauritania	2017	91	Drought	N
Micronesia, Fed. States of	2016	91	Drought	Y
Moldova	2000	89	Convective Storm	N
Cuba	2017	88	Tropical cyclone	N
Tonga	2018	84	Tropical cyclone	Y
Tonga	2022	82	Volcanic activity	Y
Korea, Dem. People's Rep.	2015	71	Drought	N

Sources: EM-DAT; WDI; WEO.

16. The impact on populations in SDS has not been confined to the most severe events. Since 2000, SDS experienced a total of 28 events affecting at least a fifth of their population, including SDS in APD (10), WHD (8), AFR (7) and EUR & MCD (3). Several SDS experienced more than one episode affecting 20 percent or more of their population.⁹ For Comoros, Dominica and Tuvalu, each major storm affected more than 40 percent of the country's population. The frequency of these events has also increased: of 30 events since 2000, 20 occurred during the evaluation period. In addition, when meteorological NDs, including tropical storms and extreme temperature changes, affecting at least a fifth of the population occurred, SDS were disproportionately hit by these events. Between 2000–2020, more SDS experienced these types of NDs than non-SDS, even though the group of SDS members is one sixth of the size of non-SDS. Non-SDS by contrast have been more heavily affected by climatological events including droughts and extreme temperature changes.¹⁰

⁹ SDS include Comoros (2005, 2019), Djibouti (2008, 2010, 2019), Dominica (2015, 2017), Eswatini (2000, 2001, 2007, 2016), Guyana (2005, 2015), Micronesia (2015, 2016), and Tuvalu (2015, 2020).

¹⁰ Geophysical events include earthquakes, tsunamis and volcanic activity; meteorological events include tropical cyclones and storms; hydrological events include floods and mass movements; climatological events include extreme temperatures, droughts and forest fires.

III. RESEARCH REVIEW¹¹

17. This section provides an overview of the literature on the economic impact of ND&CC on SDS and the contribution of IMF research.

A. External Literature

18. From its inception, the Intergovernmental Panel on Climate Change (IPCC) has emphasized that CC involves changes in both average climate conditions and climate variability and weather extremes.¹² Global mean surface temperatures have already risen by 1°C above pre-industrial levels—and are projected to rise further by 1.5°C by 2050. The rise in temperature results in a greater number of hot days bringing about increased frequency and intensity of droughts, while the rise in sea-level puts some areas at increased risk of floods.¹³ Moreover, these changes are consistent with a general intensification of the hydrological cycle, raising the frequency of extreme rainfall events, resulting in more numerous floods and landslides. In areas where tropical storms occur, changing environmental conditions provide more energy to fuel the storms, thereby making them more intense, rendering those areas even more vulnerable to NDs.

19. The IPCC has underscored that these threats are particularly great for small countries. Indeed, IPCC (2021) noted that every additional 0.5°C of global warming causes clearly discernible increases in the intensity and frequency of weather extremes, especially in the Pacific and Caribbean islands. At 2°C global warming and above, both the level of confidence and the magnitude of the change, in such extreme events rises compared to those at 1.5°C. Previous reports confirmed the particular impact for small countries where the majority of their population and infrastructures are located in coastal zones and/or where there are limited relocation opportunities.¹⁴ Furthermore, the projected rise in sea levels threatening low-lying coastal areas could make some small island states uninhabitable.

20. Despite these alarm bells, in the early 2000s economic research on the effects of NDs was still in its infancy. Some studies dealt with the effects of a single, recently occurring major ND. However, the longer-term, cumulative impact of a series of disasters on a given country received little attention, despite the fact that such recurrent shocks may have relevant cumulative effects. In turn, the limited literature available likely misled policymakers, who underestimated the nature and scale of the vulnerabilities their economies faced and failed to appreciate the potentially high economic and social returns of a disaster-resilience strategy.

¹¹ For a broader review of the literature on economic growth of SDS, please refer to Briguglio (2022).

¹² IPCC Reports are available from <https://www.ipcc.ch/>.

¹³ See, for instance, van Aalst (2006).

¹⁴ See, among others, Nurse and others (2014).

21. Against this backdrop, in 2000 the World Bank initiated a three-year study on the economic and financial consequences of NDs. The resulting report by Benson and Clay (2004) found that: disasters appear to have adverse short- and longer-term consequences for economic growth and development; smaller economies are more vulnerable; and adverse impacts can be mitigated. The report recommended that natural hazard risk management should be integrated into longer-term economic planning and appropriately reflected in the allocation of financial resources.¹⁵ A subsequent report (World Bank, 2013) underscored that identification and quantification of risks and the potential impact of hazards would enable governments to devise informed strategies for establishing development and adaptation priorities, sector plans, and budgets.

22. Subsequent studies brought out the greater impact of NDs on smaller economies. In particular, Noy (2007) found that developing countries face a much larger shock to their economies following a disaster of similar magnitude than developed countries; smaller economies also appear to be more vulnerable than larger ones to such events. Raddatz (2009) and Loayza and others (2009) provided econometric evidence on the impact of NDs on GDP in the short and long term. Raddatz indicated that NDs, especially climatic ones, have a significant negative impact on real GDP per capita. With the average incidence post-1990 of one climatic disaster every three years, these disasters would reduce per capita GDP by an overall 2 percent over a decade. Relying on a Solow-Swan model, Loayza and others (2009) took a disaggregated approach and found that different disasters affect growth in the various economic sectors differently; severe disasters were found to have a negative short-term impact on growth, with such impact being greater in developing countries. Small disasters, however, could have a positive effect in the short run, owing to a boost from reconstruction spending. Hochrainer (2009) also found a significant negative medium-term impact on growth for large shocks.

23. The World Bank (2010) emphasized economic growth and development based on sound policies and well-functioning institutions as the most effective method of adaptation to ND&CC. Jayaraman (2006) also underscored the importance of sound macroeconomic policies in SDS for building economic resilience to withstand the impact of weather-related shocks. All in all, as noted by Noy (2007), countries with stronger institutions are more effective at withstanding the initial disaster shock and preventing further spillovers into the macroeconomy.

24. Other studies underlined that CC is projected to affect SDS disproportionately, with economic costs projected at 15 percent of GDP or more by 2080. For Caribbean small states, a one-meter sea level rise by 2080 is projected to result in damages of about 8 percent of projected GDP (Simpson and others, 2010). For Pacific Island small states, a sea-level rise of between 1 meter and 1.7 meters is projected to result in an economic impact of between 3 percent and 15 percent of GDP due to losses in agricultural production, tourism, and fisheries,

¹⁵ See, also, UN (2010) and the references therein.

and to infrastructure damage (Asia Development Bank, 2013). All in all, SDS will face much larger economic costs from CC than their larger peers.

25. Subsequent contributions continued to emphasize the macroeconomic and fiscal implications of ND&CC (see, for instance, Alano and Lee, 2016; and Mallucci, 2020), adaptation and disaster reduction strategies, including the role of technology in assessing risks (Mycoo, 2018; and Khonje and Mitchell, 2019), and insurance models in catastrophe-prone Caribbean countries (Joyette, Nurse, and Pulwarty, 2014).

B. IMF Research

26. Building on the small, but growing body of external literature, IMF economists began to explore SDS vulnerabilities to ND&CC effects in the 2000s and stepped up this work in the last decade as the Fund started to pay greater attention to the threats of CC. Their research confirmed the finding that SDS are disproportionately affected by ND&CC effects, providing detailed estimates of their impact, and focused on aspects most relevant to the Fund's mandate: the macroeconomics of disasters and recovery, the impact on growth, and the need for resilience-building and disaster preparedness.¹⁶

27. In an early IMF working paper, Freeman, Keen, and Mani (2003) warned that the frequency and intensity of NDs are set to increase as a result of CC. Focusing on the Caribbean, Rasmussen (2004) showed that they are especially vulnerable. For a sample of Caribbean islands, Acevedo (2016) estimated the historical costs of hurricanes with no recorded information on damages, concluding that CC increases the probability of large NDs and raised average damages. Against this backdrop, managing ND risk would ideally involve use of insurance mechanisms, whose market is either underdeveloped or largely absent in many developing countries. As an alternative, countries can self-insure by generating public savings in good times to cover potential increases in expenditures required by future NDs. In this setting, modest investments in preventive measures could substantially mitigate the impact of natural hazards.

28. On the impact of NDs on growth, Acevedo (2014) found evidence of a short-run adverse impact in the Caribbean while the longer-term impact is found to be weak. However, Cabezon and others (2015) estimated negative short- as well as longer-term effects on growth in their sample of small Pacific islands. Looking at the same group, Lee, Zhang, and Nguyen (2018) found that severe NDs not only disrupt current economic activity but can also depress long-term growth, estimating that a severe ND tends to reduce GDP growth by an average of 1.8 percentage points in their sample. Focusing on disaster-prone countries (which largely overlaps with SDS), Cantelmo and others (2019a) found that large and persistent effects of

¹⁶ Following Briguglio and others (2009), resilience to ND&CC effects consists of policy-induced measures enabling countries to minimize or withstand the harmful effect of those shocks.

weather shocks cause a welfare loss equivalent to a permanent fall in consumption of 1.6 percent, relative to non-disaster-prone countries.

29. Cashin and Dyczewski (2006) focused on disaster management in the Caribbean. Despite the region's susceptibility to NDs, they found that risk mitigation activities have been limited in those countries. Moreover, given the severe, but rare, nature of catastrophic events, the actuarial base available for calculating probability distributions and the severity of future occurrence was limited. Thus, catastrophe insurance bears high premiums to compensate for the uncertainty factor, with premiums proportionally higher than the probability of the events against which they insure. Typically, countries affected by hazard events seek assistance from international financial institutions and bilateral donor agencies; these sources tend to disburse funds for emergency relief with no conditionality requiring disaster mitigation measures, serving essentially as reinsurers of last resort, while doing little to foster *ex ante* actions to mitigate disaster risk and/or enhancing post-disaster responses to reduce catastrophe consequences. Yet, as Acevedo (2014) noted, aid recipient countries cannot always count on the good will of their donors, as debt relief flows are exogenously determined and do not necessarily respond to the economic conditions of the receiving country. Cantelmo and others (2019b) analyzed the trade-off between financial protection and structural protection in St. Lucia in face of ND. They showed that while structural protection normally delivers a larger payoff because of its direct dampening effect on the cost of disasters, financial protection is superior when liquidity constraints limit the ability of the government to rebuild public capital promptly.

30. The importance of disaster preparedness and resilience was reiterated by Laframboise and Loko (2012). They underscored the need to integrate risk management systematically into macro frameworks by identifying and appraising risks so as to determine how much to self-insure and how much to spend on mitigating impact. In that regard, insurance penetration was seen as key to reducing the real costs of disasters without raising fiscal burdens. The authors highlighted the importance of improving transparency to bring about effective use of disaster assistance and to strengthen coordination *ex post* among multilateral institutions, donors, the authorities, and civil society organizations, particularly where administrative capacity is limited. Along similar lines, Lee, Zhang, and Nguyen (2018) proposed a method to incorporate the economic impact of NDs in macroeconomic projections and debt sustainability analysis. This is key to providing more accurate estimates on the necessary fiscal buffers for disaster response and to identifying policy priorities aimed at mitigating disaster risks. Marto, Papageorgiou, and Kluyev (2018) assessed the feasibility of *ex ante* policies, such as building adaptation infrastructure and fiscal buffers, and contrast these policies with the post-disaster support provided by donors. They concluded with useful policy prescriptions for the donor community aiming at helping governments build resilience and reduce the risk of debt distress. Their methodology was later widely used within the Fund for country applications. A more recent IMF working paper by Melina and Santoro (2021) also reiterated the importance of resilience building and showed that investment in resilience building *ex ante* is more cost-effective than reconstruction *ex post*.

31. Nishizawa, Roger, and Zhang (2019) focused on the fiscal implications of NDs. They found that, on average, a severe ND is likely to increase government expenditure cumulatively by 13.8–20.6 percent of GDP over a three-year period in their sample of small Pacific Island states. While the average magnitude is substantial, they observed that fiscal risks of NDs have yet to be taken systematically into account in fiscal planning and budgetary policies. In the absence of any significant self-insurance, those countries are highly dependent on foreign aid and budgetary reallocations to cope with NDs. Against this backdrop, the authors suggest a number of criteria to determine the appropriate size of fiscal buffers. In a similar vein, Haque and others (2016) focused on the manner in which the governments of the Pacific islands raise public revenues, implement macroeconomic policy, and ensure efficiency and effectiveness in spending programs. They went on to suggest improvements to weak public financial management (PFM) systems so as to build broader revenue bases; a better alignment of government spending programs to social and economic objectives; and increasing resilience to economic volatility and NDs.

32. IMF research efforts at the multilateral level started with a study in the 2008 World Economic Outlook (WEO) on the macroeconomic cost of CC, which analyzed policies to mitigate and adapt to CC (IMF, 2008). A chapter in the 2017 October WEO (IMF, 2017a) emphasized that the effects of CC are concentrated in countries with relatively hot climates, like many SDS. As a result, they have a particular need to boost resilience to global warming and extreme weather events, by improving their ability to smooth out evermore frequent shocks. The chapter simulated the impact policies may have in mitigating the consequences of weather shocks, arguing that, as private agents are unable to fully internalize the social benefits, governments may have to offer incentives so that adaptation is undertaken at socially optimal levels. The chapter estimates that every dollar spent on adaptation strategies over the next 20 years would reduce total weather damage by \$2, thus supporting the notion that improving resilience through public adaptation spending could reduce downturns resulting from weather-related events and accelerate recovery. In the same vein, in the 2020 April Regional Economic Outlook (REO) for Sub-Saharan Africa, a chapter examined policies and structural areas that could help the region adapt to CC by building resilience and improving coping mechanisms and reinforced previous IMF research.

Assessment

33. By the end of the evaluation period, IMF research managed to significantly build on what was only an emerging literature a decade earlier. The contributions were largely empirical, data-driven and policy-oriented, anchored in a cross-country, typically regional, perspective. While providing further evidence on the impact of ND&CC and the channels through which they affect SDS economies, IMF research investigated the differing roles that fiscal, debt, and other macroeconomic policies have in cushioning their impact. In the later years of the evaluation window, moreover, the research included general equilibrium modelling through which it assessed the cost and benefits of resilience-building policies and their impact on growth. However, IMF research rarely isolated the effect of weather and climate in a robust manner. Further research is needed to provide more effective disaster modelling and produce reliable

baseline for policy evaluation. Compared to the external research surveyed earlier, Fund research was instrumental in developing new techniques for country analysis of the macroeconomic consequences and policy responses to ND&CC. More broadly, it prompted the need for the institution to re-assess its policy guidance.

IV. IMF GUIDANCE ON MANAGING VULNERABILITIES TO NATURAL DISASTERS AND CLIMATE CHANGE

34. This section starts by laying out how the IMF developed specific guidance for work on ND&CC issues in small developing states. It then describes how this approach fits within the Fund's broader surveillance framework and lending architecture.

A. Specific Guidance on SDS Engagement

35. Starting in the early years of the evaluation period, the research efforts summarized in the previous section drew the Fund's institutional attention to the particular macroeconomic vulnerabilities that SDS face from ND&CC. Such efforts fed into a four-fold approach: (i) they first led to policy papers (i.e., IMF, 2013a; 2016) aiming at socializing the Board, Management, and staff on the vulnerability of SDS to ND&CC effects; (ii) building on that, the Fund then set out some internal guidance on policy advice that crystallized in a 2014 Guidance Note later updated in 2017 (IMF, 2014a; 2017b); (iii) next, the Fund aimed to adapt its lending instruments to reflect that vulnerability (IMF, 2019d); and (iv) towards the end of the evaluation period, the Fund introduced new diagnostic tools, such as CCPA and DRS, aimed at setting best practices and creating innovative templates for the Fund's work on CC and disaster resilience. Building on the findings of IMF research, the common thread driving the Fund's institutional efforts centered on the role that proactive public policy can have in mitigating ex ante the cost of ND&CC effects, as well as providing ex post financial support.

36. The 2013 policy paper (IMF, 2013) underlined the relevance of the work by the World Bank, the UN, and other multilateral institutions that recommended policy frameworks in the areas of preparedness, resilience-building, contingency planning, and risk reduction for addressing ND&CC. Regulatory improvements, for example in zoning rules and building codes, could reduce property damage and risk; infrastructure improvements, such as reinforced seawalls and bridges, could also mitigate damage caused by NDs. Importantly, risk reduction investment should take the place of an "after-the-fact" approach.

37. In 2014, the IMF sought to operationalize its policy advice on SDS in a Staff Guidance Note (SGN) (IMF, 2014a), later updated in 2017 (IMF, 2017b). It identified a number of priorities centered around the GROWTh compact (**G**rowth and job creation; **R**esilience to shocks; **O**verall competitiveness; **W**orkable fiscal and debt sustainability options; and, finally, **T**hin financial sectors); these were intended to guide staff dialogue with SDS authorities, while allowing for tailoring to specific features of their respective economies.

38. Specifically, the SGN called on staff to support SDS in their efforts to foster greater resilience to shocks and enhance sustainability. While the staff's engagement with authorities should exhibit an explicit focus on growth under the first pillar of the GROWTh compact, macroeconomic analysis should give prominence to potential macro-critical shocks, including those disaster related. Analysis of the economic impact of future NDs should consider the policy implications of adverse scenarios and evaluate risks around the baseline. In that context, fiscal rules should include provisions aiming at clarifying how fiscal targets should adjust in the event of external shocks. Particularly in disaster-prone countries, rules should aim at fiscal balances in normal years sufficient for building buffers and creating borrowing space. Then, the response to NDs or other shocks could be accommodated in an escape clause allowing for larger fiscal deficits. With regard to fiscal space, Fund staff should take into account the long-term implications of CC for public investment needs and how these could be financed. Along these lines, debt sustainability assessments (DSAs) would involve CC scenarios or stress tests calibrated to typical NDs, while disaster risk should feed into fiscal planning through a strong PFM system.

39. Ahead of the 2015 Climate Conference in Paris, the Managing Director issued a statement emphasizing the Fund's broader institutional view about SDS vulnerabilities to CC. Acknowledging that CC is set to have a significant economic impact on many countries, the Managing Director underscored that a large number of them are lower-income countries and small island states. As a result, she called for macroeconomic policies to be calibrated to accommodate more frequent weather shocks, for building policy space to respond to those shocks, and for infrastructures to be upgraded to enhance economic resilience (IMF, 2015a).

40. A subsequent Board paper looking specifically at SDS resilience to ND&CC (IMF, 2016) went further to recognize the macro-criticality of ND&CC for those countries whose economic performance is significantly affected. It emphasized the need for a holistic approach noting that "policies for managing ND&CC should be integrated into the Fund's toolkit on a sustained basis, applied routinely, and updated as new policy challenges emerge" (IMF, 2016; p.8). Recognizing the varied approaches from country to country, the Fund suggested drawing on good practices in a more consistent fashion, by integrating ND&CC into macro-frameworks, and risk analysis into the broader thrust of IMF work. Toward this end, it proposed the introduction of the CCPA, a focused assessment of a country's progress in developing CC adaptation and mitigation policies, as a way to help SDS access global climate funding. Finally, on lending, while the report reiterated its structured framework for the design, implementation and monitoring of resilience-building policies, it stopped short of formulating any operational implications.

41. In 2017, the updated SGN (IMF, 2017b) reinforced the case for the GROWTh compact, reiterating the importance of tailoring policy advice to SDS' specifics. In doing so, it took stock of various policy innovations that had been developed since the compact was introduced three years earlier (IMF, 2014a), including emphasis on the macro criticality of ND&CC for Fund analysis; the introduction of the CCPA tool earlier in the year; the focus on policy buffers against tail risks induced by NDs; general equilibrium modelling to assess policies before and after a

disaster (IMF, 2016); and, finally, the 2015 Guidance Note for Surveillance under Article IV Consultations (IMF, 2015b). On lending, the paper took stock of the new access policies for emergency financing¹⁷ and reiterated that conditionality in IMF-supported programs should be parsimonious and pay more attention to measures to strengthen growth performance, given the primary objective of restoring external viability. However, there was no elaboration on how such programs could directly support resilience-building and disaster strategies.

42. Building further on the 2017 SGN, a follow-on Board paper (IMF, 2019a) recommended that countries vulnerable to ND&CC prepare comprehensive DRS (see Section VII). Grounded on a clear diagnostic of those vulnerabilities, the DRS would provide a framework through which to think holistically about disaster strategies, both ex ante as well as ex post, and to coordinate the work of development partners and donors, including through estimates of funding needs. The implications were envisaged, in principle, to be relevant for all the Fund's core activities—surveillance, lending, and capacity building. Yet, the thrust of the paper—as well as the ensuing Board discussion—emphasized surveillance over lending, underscoring that strong signaling by the Fund through the DRS could have a powerful catalytic role. In discussing access to climate funds, it noted that the DRS, if endorsed by partners, could facilitate simplification of administrative requirements and criteria for qualification.

43. CCPAs were introduced in 2017 on a pilot basis as a collaborative IMF-World Bank effort, to assess macroeconomic and sectoral aspects of CC policies in countries particularly affected by CC, especially SDS (Box 1). So far, six pilot CCPAs have been completed, all for SDS, including for Seychelles (2017), Belize (2018), St. Lucia (2018), Grenada (2019), Micronesia (2019), and, most recently, Tonga (2020).

44. In 2021, the Fund reviewed its experience with the CCPA pilots to date. It found that CCPAs had been most helpful in identifying financial, policy, and institutional capacity gaps; detecting linkages between CC and the macro framework; and identifying the impact of CC risks and to some extent facilitating national planning. CCPAs had also fostered collaboration within the national administration on CC issues and had promoted engagement with international stakeholders. Staff noted that SDS members had strongly underscored the relevance of CCPAs, judging these as a high priority compared to other capacity development needs. In Grenada in particular, the CCPA had built the foundation for the subsequent, country-led DRS. At the same time, the review found that coverage could be improved, including in the areas of financing, adaptation, risk management and national processes; and that tying the modalities of delivery to the timing of Article IV missions had strained limited country resources and, in some cases, constrained early dissemination.

¹⁷ See Section VI.

Box 1. Climate Change Policy Assessments

Since their inception in 2017, six CCPAs have been prepared, all for SDS, including for three Caribbean SDS (Belize, 2018; St. Lucia, 2018; Grenada, 2019), two Pacific Island SDS (Micronesia, 2019; and Tonga, 2020); and one African SDS (Seychelles, 2017). CCPAs take stock of a country's plans from the perspective of its macroeconomic and fiscal implications by providing a holistic assessment of the relevant policy framework. In so doing, they aim to improve country prospects for attracting external finance and offer valuable policy input into their climate strategies.

While focusing on policies for adapting to CC and managing risks from adverse climate shocks, CCPAs also consider policies to mitigate a country's contribution to CC. Although the contribution of SDS to global greenhouse gas emissions is negligible, implementation of their mitigation commitments can lend credibility to small states' policy views, particularly in the international dialogue on the Paris process, and allow them to potentially leverage external finance, mobilize domestic revenues through carbon pricing, and reduce dependence on volatile international oil markets.

Although CCPAs have tended to be country-specific, there have been several common findings among the six assessments completed to date.

- In assessing countries' efforts to adapt to CC, CCPAs have tended to find that climate-informed building and land-use codes are generally outdated, that there is a need for promoting private and public disaster insurance from domestic and external sources, and that financing of adaptive projects falls significantly short.
- In considering risk management, CCPAs have generally found that despite progress in integrating CC into national plans, mainstreaming CC issues into ministries' plans and into the regular budget process is uneven, that there has generally been poor coordination among governmental and non-governmental agencies; and that while PFM systems are generally adequate, limited institutional capacity remains an overarching constraint.
- In their assessment of mitigation efforts, CCPAs have typically found that expansion of use of renewable energy sources should accelerate; fuel price subsidies should be removed while protecting the most vulnerable; and that a carbon tax should be introduced as well as "feebates" to reduce purchases of lower fuel-efficient vehicles vs. those with higher fuel efficiency.

In reviewing efforts to mobilize financing, CCPAs have generally noted that access to climate funds is constrained by sometimes heavy procedural requirements; that domestic banks do not generally fund infrastructure needs or risk reduction programs; property insurance coverage and penetration is low and falls short of expected damages; and that access to parametric insurance based on a triggered event is uneven and considered an expensive option.

Sources: IMF (2016; 2021a); CCPA reports.

45. Based on these findings, the 2021 review recommended continuation of CCPAs with SDS that were most vulnerable to CC and extension of the assessments to emerging and, possibly, some advanced economies. It also recommended a greater focus on the macro-fiscal implications of climate-change policies, while quantifying climate financing needs; and decided to extend and modify this program as the new Climate Macroeconomic Assessment Program, to be conducted solely by Fund staff.

46. Most recently, the Fund is exploring the possibility of channeling financial resources made available on a voluntary basis from the 2021 SDR allocation into a new Resilience and Sustainability Trust, which could be used inter-alia for providing long term, concessional resources for financing investment into CC resilience building.

B. The Overall Surveillance Framework

47. Starting from the beginning of the evaluation window, periodic reviews of IMF surveillance have emphasized the importance of tailoring advice to country circumstances, but initially did not pay much attention to the particular challenges of SDS arising from ND&CC effects (Table 5).

Table 5. Synopsis of IMF Policy Guidance on Natural Disasters and Climate Change in SDS

Year	Surveillance
2011	The Triennial Surveillance Review (IMF, 2011) did not mention ND&CC vulnerability. The DSA review (IMF, 2011) concluded that in SDS the impact of NDs can be included in the analysis, using historical evidence on the frequency and cost of those disasters.
2012	The 2012 Integrated Decision on Surveillance (IMF, 2012) acknowledged that, in bilateral surveillance, coverage should include focus on all relevant policies that can significantly influence present or prospective balance of payments (BOP) and affecting domestic and external stability.
2013	Policy paper on small states (IMF (2013) reviewed SDS macroeconomic features and performance and discusses how the Fund can better address their needs.
2014	The Triennial Surveillance Review (IMF, 2014) did not mention ND&CC vulnerability in SDS. The Guidance Note on SDS (IMF, 2014) set forth the GROWth compact aimed at shaping the dialogue with SDS authorities.
2015	The Guidance Note on Surveillance (IMF, 2015) acknowledged that surveillance in SDS should be tailored to their particular circumstances, including vulnerability to NDs. The MD stated that CC poses significant risks for macroeconomic performance (IMF, 2015b).
2016	Policy paper on SDS resilience to ND&CC. IMF (2016) introduced the notion of macro criticality of ND&CC stating that policies to manage the resulting vulnerabilities should be integrated into the Fund's toolkit on a sustained basis. In that setting, it proposes the introduction of CCPA.
2017	The IMF (2014) Guidance Note on SDS was updated (IMF, 2017).
2018	The Interim Surveillance Review (2018) referred to macro criticality, albeit without meaningful reference to ND&CC.
2019	The mid-point note for the Comprehensive Surveillance Review IMF (2019b) underscored that CC posed severe threats to sustained growth and economic and financial stability, recommending that bilateral and multilateral surveillance be strengthened accordingly.
2020	In the debt review for lower-income economies (IMF, 2020), Executive Directors reiterated the importance of developing scenarios that account for the impact of NDs, and underscored the importance of building resilience.
2021	The Comprehensive Surveillance Review (IMF, 2021c; 2021d) recognized CC as a "potentially existential threat with significant macroeconomic and financial implications." Climate change may generate tail-risk scenarios for some members, which need to be appraised. More ambitious adaptation and mitigation policies are required.

Source: Selected IMF Policy Documents, 2011–2021.

48. The two Triennial Surveillance Reviews (IMF, 2011a; 2014b) took place in the context of the post-Global Financial Crisis as countries continued to struggle toward recovery, while still heavily dependent on unconventional monetary policies. While the Triennial Reviews made no reference whatsoever to the macro-criticality of ND&CC, the 2012 Integrated Decision on Surveillance (IMF, 2012) did acknowledge that, in bilateral surveillance, coverage should include focus on all relevant policies that can significantly influence present or prospective BOP and affecting domestic and external stability.

49. From 2013, greater attention has been paid in the surveillance framework to the particular challenges of SDS as far as ND&CC effects are concerned. Following the 2014 SGN, the broader Guidance Note on Surveillance (IMF, 2015b) specified that surveillance in SDS should be tailored to their particular circumstances, including their vulnerability to NDs and initiatives to strengthen resilience. However, this did not translate into specific guidance relevant to ND&CC. For instance, staff was encouraged to utilize the Risk Assessment Matrix (RAM) as a structured framework for analyzing risks and their possible impact, yet NDs were not referred to as a risk despite their (increasing) frequency for part of the membership. In a similar fashion, the 2018 Interim Surveillance Review (IMF, 2018a) underscored the importance of integrating risk assessments and policy advice in macro-financial surveillance, yet there was no meaningful reference to ND&CC risks.

50. The IMF's DSA framework underscored the need to assess the impact of NDs from 2011. As laid out in IMF (2011b), given that risks do vary across countries, the analysis should consider the impact of contingent liabilities on public debt. The review found that up to that time the relevant stress tests were of little help, as they assumed an across-the-board shock of 10 percent of GDP for all countries, independent of country size or potential materialization of contingent liabilities. In SDS, though, the cost of NDs relative to the size of the economy are often disproportionately large, requiring the elaboration of alternative scenarios based on historical evidence surrounding NDs, such as related to their frequency and cost. Subsequent papers like the 2013 SGN (IMF, 2013c) emphasized the importance of adopting a tailored risk-based approach in assessing the impact of shocks on DSA. Towards the end of the evaluation window, the Guidance Note on The Bank-Fund Debt Sustainability Framework for Low-Income Countries (IMF, 2018c) explicitly recommended to incorporate into the baseline scenario the average annual expected impact of NDs for SDS at risk of ND&CC. Finally, the Board paper on public debt vulnerabilities (IMF, 2020c) has pointed to the relevance of climate-resilient borrowing.

51. More recently, there has been a more thorough attempt to integrate CC considerations into the surveillance framework. The 2021 Comprehensive Surveillance Review (IMF, 2021c; 2021d) recognized CC as a "potentially existential threat with significant macroeconomic and financial implications" (IMF, 2021c, p. 20) for which meaningful policy actions were required. More specifically, it clarified that CC may generate tail-risk scenarios for some members, which need to be appraised. In this context, the review underscored that more ambitious adaptation

and mitigation policies would be key. As follow-up, a new set of surveillance guidelines is now being prepared.

C. The Lending Framework

52. The IMF can provide financing to support SDS prone to ND&CC both after a disaster to help meet the costs of restoring the economy and in the context of a program aimed at building longer term resilience to possible shocks as part of a broader stabilization agenda

53. Post-disaster support can be provided in two ways. First, through emergency financing (EF), which is designed to provide rapid post disaster support without ex post conditionality up to quite low annual and cumulative access limits to countries that meet certain conditions. This financing may be provided when, among other things, the country is experiencing an urgent BOP need that, if not addressed, would result in immediate and severe economic disruption, often seen in the immediate aftermath of a disaster. However, access is subject to meeting a number of qualifications: inter alia, the country must make a statement on policies that it plans to pursue to address its BOP difficulties; and it must meet the usual capacity to repay the Fund and debt sustainability standards.

54. Countries that have exhausted cumulative EF access may still access IMF resources through a program with phasing and ex post upper-credit tranche (UCT) conditionality that provides assurances that adequate safeguards for IMF resources are in place. It is also possible to augment an existing UCT program to provide greater access to meet disaster needs after a disaster occurs, provided that necessary eligibility criteria are met. This can be done relatively quickly given that a program is in place.

55. The Fund has offered financing support to member countries facing exogenous shocks, including NDs, since 1962.¹⁸ However, between 1962–1995, there were no specific emergency instruments to finance countries' post disaster needs and where these occurred, the only path to finance these needs using Fund resources was to draw on a UCT program requiring ex post conditionality or through a first credit tranche drawing.¹⁹ In 1995, special facilities were introduced to provide emergency assistance to countries in the aftermath of conflict and NDs, specifically the Emergency Natural Disaster Assistance (ENDA) and Emergency Post-Conflict Assistance (EPCA) facilities. Both ENDA and EPCA provided access to General Resources Account (GRA) through one-off disbursements without ex post conditionality.

56. From 2005, after a decade in which these GRA-funded emergency instruments remained unchanged, the Fund's emergency facilities evolved quickly (Box 3). Financial support through

¹⁸ Financing has been provided for biological, geophysical, climatological, hydrological and meteorological NDs. Biological NDs include epidemics, such as Ebola and measles, as well as pandemics, such as the COVID-19 pandemic.

¹⁹ First credit tranche drawings provide for access up to 25 percent of quota without conditionality.

ENDA was provided on a concessional basis for low-income countries (LICs) from January 2005 onward. In November 2005, the Board approved the establishment of an Exogenous Shocks Facility (ESF) within the concessional Poverty Reduction and Growth Facility (PRGF), to provide EF to LICs that had no PRGF arrangement and were experiencing sudden and exogenous shocks. The PRGF Trust was renamed the PRGF-ESF Trust and provided assistance through two facilities: the PRGF and the ESF. In 2008, the ESF was modified into two components: the Rapid Access Component (RAC), consisting of a single disbursement, and a High-Access Component (HAC) providing multiple disbursements subject to reviews when more resources were needed. In 2010 the PRGF Trust replaced the PRGF-ESF Trust; and three new facilities were established: the Extended Credit Facility (ECF), Standby Credit Facility (SCF) and RCF. The ESF was superseded by the RCF and the SCF. The RCF also replaced subsidized use of ENDA/EPCA for LICs. The RFI was introduced in 2011 as a GRA-funded emergency financing instrument for a variety of exogenous shocks.

57. The emerging lending framework relevant for SDS has also evolved through repeated increases in access, as summarized in Box 2 and Table 6. In particular, an LND window was introduced allowing higher access after NDs with costs greater than 20 percent of GDP.

58. At present, the two current facilities for emergency financing are the GRA-funded RFI and the concessional RCF. These two instruments include no ex post conditionality consistent with the aim of addressing urgent BOP needs, while still requiring that a country meet a number of conditions for access (see Abrams, 2021). They provide access up to 50 percent of quotas annually, which is raised to 80 percent of quota for a LND, under both the RFI and the RCF. As part of the COVID-19 pandemic response, EF annual access limits (for exogenous shocks) were raised on a temporary basis to 100 percent of quota, and on a cumulative basis to 150 percent of quota (net of scheduled repayments and repurchases). The annual access limit increases lasted through end-2021, while the cumulative access limit increases were recently extended by the Executive Board through end-June 2023.

59. On the whole, in upgrading its toolkit for providing emergency financial support to countries affected by disasters, the Fund has followed a multipronged approach. Elements included: (i) increasing access to its assistance so as to better address the immediate needs of a disaster-hit country; (ii) (marginally) modifying design of facilities in an effort to make them more appealing to relevant members; (iii) discouraging facility and conditionality shopping, and ensure adequate safeguards for high access to IMF resources; (iv) encouraging the catalytic role of IMF financing to foster additional financing from other sources; and, finally, (v) preserving the sustainability of the Poverty Reduction and Growth Trust (PRGT) resources, where applicable. Some of these criteria potentially run in opposite directions. Meeting the large needs of a disaster-hit country with an emergency drawing may reduce incentives to apply for a program with upper-credit-tranche conditionality; hamper the Fund's catalytic role and reduce incentives to undertake policies to improve resilience to future shocks.

Box 2. Evolution of Access Policy in Emergency Financing

At the outset, the RCF provided two access windows—a “regular” window, with an initial annual access of 25 percent of quota and cumulative access of 75 percent; and an “exogenous shocks window” providing countries with access to emergency financing when faced with exogenous shocks include both economic (e.g., terms of trade) and non-economic shocks (e.g., NDs) that were sudden and not related to members’ policies, with initial annual access of 50 percent and cumulative access of 100 percent. Limits for annual and cumulative access to both windows increased in 2013 and 2015 (see Table 6).

A large natural disaster (“LND”) window was introduced in 2017 for both the RCF and RFI, with qualification hinging, among other things, on meeting a large-disaster damage threshold of 20 percent of the relevant country’s GDP. For countries experiencing LNDs, annual access for eligible countries under the RCF was lifted from 37.5 percent of quota to 60 percent of quota, while leaving cumulative limits unchanged at 75 percent so as to preserve incentives to seek UCT-quality arrangements. These limits were intended to preserve the sustainability of the Poverty Reduction and Growth Trust (PRGT) resources while encouraging countries to invest in resilience policies to counter the effects of smaller disasters. This latter aspect is also consistent with leaving the cumulative access unchanged: countries expecting to be hit by frequent NDs should have a stronger incentive in investing in resilience (IMF, 2017c). With the decision in 2017 to introduce the LND window, this became the third window for access to RCF resources.

Initially, when introduced in 2011, the RFI included a single “regular” window, with an annual access limit of 50 percent, double the limit provided by its predecessor ENDA, and a cumulative access cap of 100 percent (IMF, 2011c). This new facility would not be used for a number of years, however, perhaps due to the low level of access or to the availability of alternative buffers inside and outside the Fund (IMF, 2014d). Annual and cumulative access limits were raised in 2015 to 50 percent and 75 percent, respectively, in 2015. With the introduction of the LND window in 2017, countries experiencing an ND of at least 20 percent of GDP were able to qualify for enhanced annual access of 60 percent, with cumulative access kept at 75 percent.

The review of low-income facilities in 2019 further increased access, informed by the fact that climate-related NDs were increasing in both intensity and frequency, potentially adding to demand for emergency financial support, especially for SDS. In addition to a one-third generalized increase in access limits, the Fund also doubled the annual RCF access limit to 50 percent of quota and cumulative access up to 100 percent of their quotas. Moreover, annual access in the LND window was raised up to 80 percent of quota and cumulative access up to 133.3 percent. Access under the RFI was also raised by a similar amount to preserve the harmonization of access limits across the RFI and RCF (IMF, 2019a). Staff indicated that these revisions would have only a slight impact on PRGT finances, since the higher LND threshold would primarily serve SDS, and thus have a limited aggregate effect.

Most recently, in 2020, following the outbreak of the COVID-19 pandemic, access limits for the RFI and RCF were lifted again, albeit this time on a temporary basis. Specifically, annual and cumulative access were raised to 100 percent of quota and 150 percent of quota, respectively. In line with previous decisions, the new, temporary policy would not increase the risk of facility shopping: the annual limit would remain well below GRA- and PRGT-normal annual limits so as to preserve a link between larger access and UCT arrangements. Access limits under the LND window of the RCF/RFI were temporarily increased to 130 percent and 183.33 percent through end-December 2021, after which the annual access limit reverted to 80 percent and the cumulative access limit remained at 183.33 percent until end-June 2023.

Sources: ENDA, EPCA, RCF and RFI Emergency Financing Documents, 2005–2020.

Table 6. Emergency Financing Access Under the RFI and RCF, 2009–2020

Year	Access		Notes
	RFI	RCF	
2009		RCF introduced: 25 percent annual access and 75 percent cumulative access percent of quota under a "regular window." Fifty percent annual access and 100 percent cumulative access under an "exogenous shocks window."	Introduced the RCF as a unified instrument to provide rapid, emergency-driven concessional financing.
2011	RFI introduced: 50 percent (annual access) and 100 percent (cumulative access) of quota, respectively, under a "regular window."		Introduced the RFI as a unified instrument to provide rapid, emergency-driven GRA-funded financing.
2013		Annual access unchanged. Cumulative access under regular window increased from 75 percent to 100 percent. Cumulative access under exogenous shock window increased from 100 percent to 125 percent.	Following the entry into effect of the Fourteenth General Quota Review (in January 2016), annual access was reduced to 12.5 percent and annual access to 50 percent under the regular window. Under the shock window, annual access went down to 25 percent of quota and cumulative access to 62.5 percent of quota.
2015/16	Annual access raised from 50 percent to 75 percent and cumulative access from 100 percent to 150 percent of quota. In 2016, Following entry into effect of the 14 th General Quota Review, annual access halved to 37.5 percent and cumulative access halved to 75 percent.	Annual access and cumulative access under the regular window increased from 25 percent to 50 percent and 100 percent to 150 percent, respectively. Annual access and cumulative access under the exogenous shock window increased from 50 percent to 75 percent and 125 percent to 150 percent, respectively. Following entry into effect of the 14 th General Quota Review, annual access halved to 37.5 percent and cumulative access halved to 75 percent.	Access increases decided in the context of strengthening financial safety nets for developing countries.
2017	Annual access further increased to 60 percent for countries experiencing large NDs, cumulative access kept at 75 percent.	Annual access increased to 60 percent for countries experiencing large NDs; cumulative access kept at 75 percent.	Increase in annual access only applies to countries experiencing a natural disaster of at least 20 percent of GDP.
2019	Annual and cumulative access raised to 50 percent and 100 percent of quota, respectively. Under a newly introduced large natural disaster window, annual and cumulative access raised from 60 percent and 100 percent to 80 percent and 133.3 percent of quota, respectively.	Annual and cumulative access raised to 50 percent and 100 percent of quota, respectively. Under the large natural disaster window, annual access raised from 60 percent to 80 percent of quota. Cumulative access raised to 133.3 percent.	Increased access decided in the context of the 2018–2019 Review of Facilities for Low-Income Countries.
2020	Annual and cumulative access increased temporarily from 50 percent and 100 percent to 100 percent and 150 percent of quota, respectively.	Annual and cumulative access increased from 50 percent and 100 percent to 100 percent and 150 percent of quota, respectively, under the exogenous shock window.	Increased access decided on a temporary basis to help members cope with the pandemic. Temporary increase to end at end–2021.

Source: IMF Board papers.

60. Besides upgrading its emergency financing toolkit, the Fund also has amended its framework for PRGT arrangements. In particular, it raised the maximum duration of program support through concessional UCT arrangements in an effort to better tailor their design to vulnerable countries needing longer periods to put in place deep reforms (IMF, 2019d). The maximum length of the SCF was extended by a year to three years, while the maximum duration of the ECF increased from four to five years. Although the 2019 review underscored the relevance of country strategies to drive reform efforts, there was no mention of how lending facilities could be informed by, and provide more support to, country-owned climate-adaptation and disaster resilient strategies. That is to say, the appraisal of the facilities was not informed by how they could contribute to a country's climate strategy, despite the stream of work reviewed in Section III. In terms of conditionality, the Fund's arrangements did not focus on building resilience in vulnerable countries.

61. Indeed, conditionality in the few small state programs assessed by the 2019 Review of Conditionality (IMF, 2019c) focused on growth and competitiveness, PFM, revenue administration and state-owned enterprise reform, and the financial sector. (The case studies for this evaluation paint a consistent picture.) The 2019 review found that conditionality did not adequately focus on building resilience in the face of NDs, even when that was a program objective or a key program risk. The review concluded that, to better foster efforts to build resilience, tailoring in line with CCPAs would be required; this would support the building of buffers and the enhancement of disaster preparedness, institutions, and coordination of capacity building. A Fund-supported program based on resilience building could also facilitate CC financing from donors and institutions, access to which can involve complex procedural requirements.

V. IMF SURVEILLANCE

62. The section assesses to what extent IMF surveillance has been tailored to the macro critical dimensions of ND&CC in SDS economies. More specifically, it examines whether, and to what extent: (i) surveillance analyzed growth and potential shocks related to ND&CC; (ii) surveillance considered the effects of ND&CC; (iii) surveillance discussed disaster preparedness and resilience building; (iv) specific analytical tools (DSAs, CCPAs) contributed to relevant and well-tailored surveillance activities; (v) the Fund interacted with other partners; and finally (vi) surveillance was consistent with the relevant Guidance Notes.

A. Review of Country Experience

63. The assessment draws from a non-random sample of 11 countries (Table 7). Some are micro-states (Grenada, Micronesia, Seychelles, St. Lucia, and Tonga). Most are islands, others are coastal (Belize, Guyana), and one is landlocked (Bhutan). Some undertook a CCPA (Belize, Grenada, Micronesia, Seychelles, St. Lucia, and Tonga); others did not (Bhutan, Cabo Verde, Guyana, Maldives, Solomon Islands). One (Grenada) developed a DRS.²⁰ Discussions with the East

²⁰ Dominica is the other country that has developed a DRS. DRS are assessed in Section VII.

Caribbean Currency Union, of which two of these countries are members (Grenada and St. Lucia) are also included.

Country	Size		Income Level			Geography			Region/Department			Exposure* PRGT CCPA			
	Micro	>1mill	Quota %	Low-mid	Up-mid	High	Island	Coastal	Land-locked	APD	WHD	AFR	Rank		
Belize			0,006		1		1			1			18	1	1
Bhutan			0,004	1					1	1			51	1	
Cabo Verde			0,005	1			1				1		43	1	
Grenada	1		0,003		1		1			1			37	1	1
Guyana			0,038		1			1		1			14	1	
Maldives			0,004		1		1			1			8	1	
Micronesia			0,001	1			1			1			5	1	1
Seychelles	1		0,005			1	1				1		17	1	1
Solomon Islands			0,004	1			1			1			11		
St. Lucia	1		0,004		1		1				1		29		1
Tonga	1		0,003		1		1			1			7		1
Total	4		0,079	4	6	1	8	2	1	5	4	2		8	6

Source: IEO.
Note: *Ranking from the 2018 UN Exposure Index.

64. The evidence gathered has to be put in the broader context of the unique challenges faced by SDS. As staff interviewees consistently pointed out, SDS faced significant data constraints in terms of the underlying quality, quantity, timeliness, and frequency of availability of data for surveillance purposes. Lack of institutional capacity further added to the challenge, because it hinders the traction of surveillance advice as noted by an interviewee. Moreover, staff interviewees invariably underscored the difficulty of staffing SDS missions as staff were attracted by other, more career-enhancing opportunities within the Fund (Rustomjee, Chen, and Li, 2022). As a result, as one senior staff put it, in SDS “there is less institutional memory” in IMF staff working on SDS. Such difficulty, it was argued, compounds the challenge of finding economists with expertise—or an interest—in CC and, more broadly, is at odds with the objective of building and retaining knowledge. All in all, these multiple factors may, at least in part, account for some variation observed in the treatment of ND&CC effects.

Heatmap Exercise

65. In a simple heatmap exercise, country experience was assessed by identifying to what extent ND&CC issues were covered for each sampled country, over successive Article IV consultations, based on a simple binary scoring methodology.²¹ In particular, the indicators refer to whether the impact of ND&CC effects: (i) were featured as risks in the policy consultations;

²¹ For a recent application of this methodology, see, among others, Gallagher (2020).

(ii) were embedded in the DSA; (iii) were appraised in terms of growth prospects; (iv) were referenced in discussing the role of other partners and donors; and, finally, (v) whether ND&CC broadly informed the policy discussions with the authorities. For each of these variables, a simple yes or no approach was used with yes equal to one and no equal to zero. The results are summarized in Table 8 and in more detail in Annex Table AIII.2.

66. Overall, results of this exercise were mixed, mostly reflecting less attention to ND&CC issues in Article IV surveillance for countries that did not undertake a CCPA.

67. For the countries that undertook a CCPA, the impact of NDs and the effects of CC on surveillance were greatest in the year when the CCPA was finalized, with likely spillover effects on the years immediately before and after. The introduction of CCPAs with their capacity development diagnostics tools provided a galvanizing framework, as many interviewees noted. Consistent with IEO (2020b), CCPAs increased traction with authorities and improved coverage of climate issues in Article IV consultations. Internally to the Fund, CCPAs facilitated input from—and provided ownership to—other departments. Moreover, they signaled “buy in” from the top echelons of the IMF to CC issues, as one interviewee pointed out. For the country teams, CCPAs enabled the building of a critical mass of knowledge on the impact of ND&CC effects on which to leverage policy analysis. Externally, CCPAs offered a structured tool for engaging the World Bank and other international development agencies, resulting in effective collaboration in line with the findings of IEO (2020b). Moreover, CCPAs also contributed to improving the specificity of analysis of climate issues in surveillance. Fund interviewees for the IEO’s evaluation of Bank-Fund Collaboration, for example, noted that the analysis of climate issues in the Article IV surveillance the year prior to the CCPA had been tentative, whereas the following year the CCPA analysis was stronger, broader and more specific—including in particular the scope for disaster risk insurance based on input from the Bank (IEO, 2020b).

68. While the incidence of a CCPA clearly strengthened attention to ND&CC issues in surveillance, the choice of a country to benefit from a CCPA likely reflected an underlying strategic decision to deepen the focus on ND&CC in the countries concerned—a focus that surveillance activities benefitted from—and to provide an organizing framework for that. Accordingly, CCPAs and surveillance activities were both reflective of this strategic orientation, which is consistent with the feedback received from interviews.

69. Conversely, the heatmap exercise suggests that surveillance in many countries without a CCPA did not adequately incorporate the impact of ND&CC effects. For some of these non-CCPA countries, gaps and unevenness in the coverage of ND&CC tended to narrow over time, albeit to a partial extent. At the same time, as the case of the Solomon Islands attests, embedding ND&CC into surveillance work does not necessarily require a CCPA.

70. As shown in Table 8 (and in more detail in Annex Table AIII.2), non-CCPA country surveillance did not typically acknowledge risks from ND&CC. Along similar lines, assessment of such risks did not feed into growth (with the exception of Belize) and fiscal policy appraisals.

ND&CC were referred to sometimes when citing the work performed by other partners, though most often in the annexes to the Article IV reports. At times, the impact of ND&CC effects was broadly referenced in the non-CCPA country reports, yet not in a systematic way with meaningful elaboration. This was, for instance, the case of Guyana and Maldives: policy discussion broadly referenced ND&CC, yet that did not translate into a tailored DSA, related growth appraisal, or calibration of fiscal policy advice.

Table 8. Surveillance Heat Map—Total Scores

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bhutan		2			2		1		0		
Cabo Verde	0				0		0		2	2	
Guyana	2				2		1	2	2	2	
Maldives	0		1		2		1	3		2	
Solomon Islands		1		1			6	6	6	6	
Belize	3	2		2	3	1	2	4	6	6	
Grenada (1)					4		6		6	6	
Micronesia		5				5			6	6	
Seychelles	1			1		1		6		6	
Tonga	2	3	4	3	4	4	6	6			

Source: IEO.
Notes: (1) =2012 and 2014 Article IV Consultations were not published;
Total Score= 0, 1 2,3,4 5,6
Refer to main text for taxonomy criteria.

71. Nevertheless, the scoring approach does point to some increasing coverage over time, especially for the Solomon Islands and, to some extent, for Cabo Verde. The former goes from one to six in 2016 and remains so thereafter, while Cabo Verde witnesses an increase from zero to two in 2018 and 2019. Other non-CCPA countries offer no systematic evidence of improvement over time (Bhutan, Guyana, and Maldives).

Documentary Review

72. Evidence from the documentary review of coverage of members' Article IV reports broadly confirm the findings obtained from the heat map exercise. In particular, the focus on growth and potential shocks related to ND&CC effects was generally poor in the early years of the evaluation period, but increased over time, particularly in countries benefiting from a CCPA.

73. For example, in Cabo Verde's earlier Article IV consultations (2010, 2014, 2016), growth discussions made no reference to the risks of ND&CC on growth. Despite the Gray statement by the Executive Director for Cabo Verde pointing to the country's vulnerability to NDs, the 2016 consultations were built on a risk framework that emphasized the vulnerability stemming from a slowdown in the Eurozone and from the contingent liabilities associated with state-owned enterprises. Along similar lines, in Micronesia, the 2012 Article IV Report pointed to commodity price volatility and the risks that could propagate from the intensification of the Eurozone crisis, with NDs not included in RAM. CC—and the associated shore erosion of limited farmland—was acknowledged in the report as a source of long-term risk, but without elaboration.

74. Even when there was a reference in the documents, coverage of the impact of NDs or the effects of CC on growth was quite limited. In the 2010 consultations with Guyana, adverse weather conditions were referred to when commenting on the disappointing sugar production. Yet, the policy discussions did not take account of the impact of ND&CC effects in the macroeconomic framework by explicitly incorporating them into the growth appraisal. In 2014, the Article IV consultations followed a similar thrust. The 2017 consultations referred to adverse weather conditions that had affected rice and cotton output and generically recommended building resilience to ND&CC as a way to promote inclusive growth. In a similar vein, in Bhutan, surveillance reports pointed to the impact of NDs, though they were not incorporated into growth projections. Following the NDs caused by Cyclone Aila in May and earthquakes in September and December of 2009, the 2011 consultations recommended a prudent fiscal policy, through the introduction of a spending ceiling, and highlighted the need for escape clauses to address tail risks such as NDs.

75. In the early years of the evaluation period, consultations also did not incorporate ND shocks in their DSAs. As noted above, the 2011 guidance on preparing DSAs (IMF, 2011b) had highlighted the need for appraising contingent liabilities realistically, moving away from highly standardized stress-testing to enable for a more realistic costing of NDs, citing exactly the case of Hurricane Ivan that had inflicted on Grenada damages equal to twice the size of its GDP. However, this guidance was not followed with much depth. For instance, the 2014 consultations with Grenada acknowledged risks from NDs, yet the DSA did not account for their direct impact. In Bhutan, policy discussions in 2011 and 2014 noted operational risks for intergovernmental hydropower projects—including those stemming from NDs—when assessing debt sustainability, yet the DSA did not incorporate risks from an explicit ND shock. In Maldives, the 2014 Article IV recognized environmental challenges, yet the DSA focused on debt distress triggers like fiscal policy slippages and shocks to tourism exports or foreign direct investment. In the 2016 consultations, the thrust of the policy advice recommended that domestic policies should support adaptation and resilience building, yet there was no formal calibration of ND risk or CC effects in the macroeconomic framework or the DSA, which focused on exchange rate depreciation and export shocks.

76. In the earlier years of the evaluation period, surveillance documents hardly referred to CC, even when its effects were macro critical. In Belize, a country heavily challenged by CC, early consultations did not apparently feature this issue in the conversation held with the authorities. Article IV documents pointed to the entrance of Cuba in the tourism market as a downside risk, and social security liabilities as a source of long-term risk. As for Maldives, the 2012 Article IV documents referred to CC as a longer-term, key challenge for the country. Yet, apart from this reference, the policy discussions reported in surveillance documents did not touch on ways to incorporate that challenge into a consistent macro-fiscal framework, while the risk assessment focused on the prospects for a currency crisis or the decline in tourist arrivals. Subsequently, the 2016 policy documents acknowledged that the country could face the highest economic burden in South Asia from CC, yet there was no formal calibration of ND risk or CC effects into the macroeconomic framework.

77. As for disaster preparedness and resilience building, surveillance reports paid limited attention early in the evaluation period. For example, in the case of St. Lucia, the 2011 Article IV report, following Hurricane Tomas the year before, focused on the macroeconomic framework of reconstruction, yet lacked any reference to resilience and disaster preparedness. In the 2015 report, it was recommended to build up resilience to future weather events, although the recommendation was not meaningfully elaborated. Experience of other consultations offered a roughly similar picture. In the Maldives, the 2016 policy discussions noted that domestic policies should support adaptation and resilience building, yet there was no formal calibration of ND risk or CC effects into the macroeconomic framework.

78. Surveillance was quicker to recognize risks from extreme weather events after a disaster hit. In Grenada, after one of the strongest hurricanes in the region hit the country in 2004 (Hurricane Ivan), followed by another one in 2005 (Hurricane Emily), the 2014 consultations acknowledged risks from NDs, recognizing them as an impediment to growth and fiscal sustainability. More specifically, discussions pointed to potential, severe damage to infrastructures and disruption to tourism flows, with the cost of infrastructure rehabilitation putting further pressures on the already weak fiscal position. The longer-term implications arising from CC, however, were not elaborated upon. In another Caribbean country, St. Lucia, following Hurricane Tomas, which had devastated the country the year prior, the 2011 Article IV Consultations focused on the macroeconomic framework of reconstruction, although there was no discussion of longer-term CC effects. In the 2015 report, the impact of NDs on growth was assessed in the context of a multi-year fiscal adjustment plan that took into account the occurrence of NDs. The consultations recommended, moreover, the build-up of further resilience to future weather events through the appropriate selection and design of key infrastructure projects, but there was still no meaningful reference to longer-term challenges from CC.

79. Surveillance on the Solomon Islands also had provided early attention to ND&CC issues. The 2011 consultations referred to adverse weather shocks and CC effects, drawing from the country's national strategy to mainstream ND&CC risks into national development planning.

Along similar lines, the ensuing consultations in 2013 pointed to the need for significant investments to mitigate the risk of NDs and consequences of CC. Yet, as in 2011, they went no further.

80. The treatment of growth implications of vulnerability to ND&CC effects deepened considerably in the later years of the evaluation period, mostly in CCPA countries. In Tonga's 2017 report,²² just before its CCPA, the discussion on growth was set in the broader context of ND&CC. Growth prospects were assessed amidst the occurrence of extreme weather events and CC effects. The impact of a ND shock on growth and exports was costed in the macroeconomic framework. Policy discussions also pointed to how the authorities should prioritize investments aimed at improving inclusive growth potential. In other CCPA countries, namely, St. Lucia, Micronesia, Grenada, and Seychelles, consultations around the time the CCPA was undertaken offered a relevant appraisal of growth prospects in the context of their vulnerability to ND&CC effects, which was costed and incorporated into the macroeconomic framework.

81. In more recent years, the DSA included ND stress tests more systematically. This is particularly true among CCPA countries, but also in some non-CCPA countries. Among the latter, in the Solomon Islands the 2016 consultations recognized that the country continued to be subject to adverse weather-related events with the DSA incorporating the effects of those events as well as CC in both the baseline and alternative scenarios. In Maldives, the 2018 consultations acknowledged the country's exposure to NDs with related shocks incorporated into the DSA stress testing.

82. In the later part of the evaluation window, disaster preparedness and resilience building were incorporated more fully into the Fund's advice. Referencing the case of the Solomon Islands, the 2016 consultation discussion featured a strategic, well-structured plan put forward by staff, which rested on four pillars: a risk assessment costed into the budget and the medium-term fiscal framework; self-insurance through policy and financial buffers; reducing risk through "smart" infrastructure; and risk transfer mechanisms through insurance. In the following year, the development of a general equilibrium model enabled the analytical assessment of policy trade-offs, including resilience-based spending. Relatedly, staff recommended that a medium-term fiscal analysis, including an assessment of the expected fiscal costs from ND&CC adaptation, would help the appraisal of trade-offs between development spending and building buffers, such as, for instance, the benefits of investing in disaster risk reduction and contingency planning. Moving to the Caribbean, in Grenada, the 2016 consultations deepened the focus on the impact of NDs, as discussions with the authorities emphasized building resilience as key to boosting growth and sustainability. That was appraised, moreover, in the context of the inclusion, for the

²² The 2020 Article IV report for Tonga was published in February 2021. As it fell outside of the evaluation window, it was not included in the analysis. However, had it been included, it would have perfectly scored in the heatmap exercise and would have confirmed the finding that CCPAs, if available, have been fully mainstreamed into the surveillance dialogue with country authorities.

first time ever, of ND contingency clauses in debt restructuring agreements that the authorities had negotiated with creditors, with technical support from staff (Erce, 2021).

83. The treatment of disaster preparedness and resilience building was particularly deep in countries that benefitted from CCPA towards the end of the evaluation period. For example, in the 2018 Article IV report on Grenada, vulnerabilities to NDs were assessed in the context of strengthening the capacity to appraise risks from ND&CC and to determine investments required for ensuring greater resilience. Drawing from the CCPA finalized in the same year, the consultations culminated with the advice to work on a single operational document integrating the three pillars of resilience-building (structural, financial, and post-disaster resilience)—a Disaster Resilient Strategy. Along similar lines, in other CCPA countries, consultations underscored the need to intensify efforts to build resilience through investments in adaptation infrastructure, greater self-insurance, and optimized use of risk management instruments. In turn, raising resilience to natural hazards would provide relevant long-term gains to growth by strengthening the fiscal position and reduce macroeconomic volatility. In that setting, the advice culminated by recommending the development of a fully-fledged DSA.

84. Another good example of greater attention to ND&CC issues in recent years was the IMF surveillance of the ECCU, which effectively leveraged on its regional dimension to develop relevant policy advice on CC issues. In the 2019 report, using simulations that indicated potential role for regional risk sharing, staff suggested a regional stabilization fund (RSF) comprised of pooled resources to serve as a fiscal buffer in the face of NDs or other shocks. Cyclical asymmetries across countries implied that, with a pooled RSF, individual countries would see savings of close to one-half of the sum required for the same stabilization effect, as cross-country transfers would reduce the amount of assistance required regionally. Public expenditure procyclicality would also see a reduction with a RSF, while public investment would increase. Saving resources historically used to finance government consumption booms could, according to the simulations, increase public investment by 0.5–1.5 percent of GDP annually. This would, of course, bear a strong stabilization effect and boost employment, wages, private investment, and output.

85. In countries that benefitted from a CCPA, there was effective collaboration with the World Bank on CC issues (IEO, 2020b). However, elsewhere, especially in the earlier years of the evaluation window, consultation documents tended to refer to work by other partners as substitute for a substantive discussion of NDs and, particularly, CC in this area. For example, in Guyana the reports referred to the World Bank's work on CC and environmental resilience. In the same vein, the 2015 consultation with St. Lucia simply referred to the work of the Caribbean Development Bank and the World Bank Group in the annexes. In the same year, the consultations with Belize mentioned the work done on climate-resilience infrastructure and natural-disaster risk management with the support of the World Bank and the Inter-American Development Bank, still in the annex. The 2016 report acknowledged NDs as an adverse shock, yet there was no meaningful reference to CC effects, which were only mentioned in the appendices devoted to the

work of the World Bank and the Caribbean Development Bank with the country in question. Still, in the Maldives 2014 Article IV, staff recognized environmental challenges—including the detrimental impact of CC—but the policy response was mandated to other multilaterals.

B. Overall Assessment

86. The focus on growth and its shocks related to ND&CC effects in IMF surveillance was found to be highly uneven across countries and over time. CCPA countries generally scored better particularly in more recent years. In non-CCPA countries, consultations generally paid limited attention on weather-related shocks and CC issues, with the significant exception of the Solomon Islands, though gaps and unevenness tend to narrow, to some extent, over time.

87. The introduction of CCPAs provided a galvanizing framework, increased traction with authorities and improved coverage of climate issues in Article IV. For country teams, CCPAs enabled the building of a critical mass of knowledge on the impact of ND&CC effects, on which to leverage for performing policy analysis. In pilot-countries, DSAs featured ND shocks. For non-CCPA countries, however, DSAs were typically not tailored accordingly, with exceptions. CCPAs also offered a structured framework for engaging the World Bank and other partners, resulting in effective collaboration, in line with the findings of IEO (2020b). However, in the absence of a CCPA, the Fund often just referred to World Bank work on ND&CC issues, without seriously integrating results in the macroeconomic framework.

VI. IMF FINANCIAL SUPPORT

88. During the evaluation period, SDS received IMF financing both for post disaster support, to help meet the costs of restoring the economy after disasters struck and also in the context of Fund-supported programs. SDS drew on EF for support in the immediate aftermath of a non-biological ND on 9 occasions, 6 of which were funded from the PRGT and 3 by a blend of PRGT and GRA resources (Table 9). In addition, SDS entered into 19 programs, 12 of which were PRGT funded and 7 GRA funded. None of these 19 programs were entered into with the objective of financing ND recovery, although on two occasions (once for a program approved before the evaluation period) program access was augmented in response to an ND. Most recently, SDS made 16 drawings in 2020 to address the COVID-19 pandemic.

89. This section reviews Fund lending both through EF and IMF-supported programs. The first sub-section examines SDS experience with EF for NDs, focusing attention on physical NDs and not covering biological disasters, including the COVID-19 pandemic, except where specifically indicated. Building on evidence of SDS's proneness to frequent severe NDs in Section II and description of the evolution of access policy in EF in Section IV, it considers the frequency of use and extent to which EF was used to provide support in the context of the most severe NDs. The second sub-section evaluates SDS experience in utilizing UCT arrangements under the GRA or PRGT, looking into whether ND&CC vulnerabilities prompted an arrangement and informed program design, for example to build disaster resilience.

Table 9. SDS Emergency Financing and Fund-Supported Programs, 2000–June 2021

Period	Emergency Financing for Natural Disasters			Program Lending for Natural Disasters (Number of)			Program Lending (Other Purposes)			Emergency Financing for COVID-19 Pandemic		
	GRA	PRGT	GRA/PRGT Blend	GRA	PRGT	GRA/PRGT Blend	GRA	PRGT	GRA/PRGT Blend	GRA	PRGT	GRA/PRGT Blend
2000–2009	4	6	-	-	-	-	1	9	-	-	-	-
2010–2019	-	6	3	-	-	-	7	12	-	-	-	-
2020–June 2021	-	-	-	-	-	-	-	-	-	4	10	2

Sources: SPR program database; IEO calculations.

Note: (i) Excludes IMF financing for biological NDs; (ii) shaded areas denote EF and program covered in this paper; (iii) EF operations to support SDS during the COVID-19 pandemic are covered in a separate paper for this evaluation (Maret, 2022); and (iv) includes all programs ending during the specified date range.

90. Key evaluation questions include: (i) whether program support to SDS was relevant with respect to ND&CC-related vulnerabilities; (ii) whether conditions focused on, or related to, such vulnerabilities, whenever macro-relevant; (iii) whether program outcomes were consistent with program design in relation to the ND&CC component; (iv) whether lending and non-lending facilities were well-suited to meet ND&CC-related vulnerabilities; and (v) how the Fund interacted with other partners and whether such interactions were beneficial in terms of relevance and quality of the underlying activities.

A. Experience with Emergency Financing

91. SDS utilized IMF financing to address the impact of non-biological NDs on 21 occasions from 1979 to December 2020 (Table 10).²³ Between 1979 and 1998, five SDS used GRA resources to address the impacts of NDs. Three of these occasions involved Stand-By Arrangements with upper credit tranche conditionality and two comprised lower credit tranche (LCT) drawings.²⁴ Since 1998, SDS have only used EF to support post disaster needs, following introduction of these special facilities in 1995. Five drawings used the GRA-funded ENDA (all before the evaluation period) and eleven were financed under the PRGT, or a blend of PRGT and GRA measures. Among nine EF drawings during the evaluation period, six used PRGT resources and three used a blend of PRGT and GRA resources. Access levels ranged from 15–35 percent of quota in 2011–2012, to 50–100 percent of quota from 2013.

²³ As noted earlier, biological NDs, including epidemics such as the Ebola virus and measles, as well as pandemics such as the COVID-19 pandemic, are not evaluated in this section. Prior to the COVID-19 pandemic, no SDS member used Fund EF to support recovery from a biological ND, while four non-SDS utilized the RCF to address the outbreak of Ebola: The Gambia (2015); Guinea (2015); Liberia (2015); and the Democratic Republic of the Congo (2019).

²⁴ Dominica (1979), Solomon Islands (1986) and St. Kitts and Nevis (1998) all entered into Stand-By Arrangements with UCT drawings requiring ex post conditionality, while St. Lucia (1980) and St. Vincent and the Grenadines (1980) accessed resources without conditionality, through lower credit tranche drawings.

Table 10. IMF Financing for Natural Disasters in SDS: 1979–2020

Period	Country	Event Year	Type of Natural Disaster	Damages/GDP (%)	Program Financing		Emergency Financing		
					GRA	PRGT	GRA	PRGT	GRA/PRGT Blend
1979–1999	Dominica	1979	Storm	81	SBA				
	St. Lucia	1980	Storm	52	LCT				
	St. Vincent & the Grenadines	1980	Storm	20	LCT				
	Solomon Islands	1986	Storm	14	SBA				
	St. Kitts and Nevis	1998	Storm	109	SBA				
2000–2009	Grenada	2003	Storm	200			ENDA		
	Grenada	2004	Hurricane	148			ENDA		
	Maldives	2004	Earthquake	38			ENDA		
	Dominica	2008	Hurricane	na				ENDA	
	Samoa	2009	Tsunami	21				ESF	
	Belize	2009	Hurricane	na			ENDA		
	St. Kitts and Nevis	2009	Hurricane	na			ENDA		
2010–2020	St. Lucia	2010	Hurricane	na			RCF & ENDA		
	St. Vincent & the Grenadines	2011	Hurricane	11			RCF		
	St. Vincent & the Grenadines	2011	Flooding	4			RCF		
	Samoa	2012	Cyclone	30			RCF		
	Dominica	2012	Flooding	7			RCF		
	St. Vincent & the Grenadines	2013	Flooding	15					RCF-RFI
	Dominica	2015	Storm	96			RCF		
	Vanuatu	2015	Cyclone	60					RCF-RFI
	Comoros	2019	Storm	13					RCF-RFI

Sources: Finance Department; WEO; EMDAT.

92. Altogether, 11 SDS members have used EF in response to non-biological NDs since 2003, five prior to the evaluation period and six during the evaluation period. Several SDS, notably St. Vincent and the Grenadines and Dominica, have been repeat users.^{25, 26, 27} Among SDS, Caribbean members were by far the most frequent users, utilizing EF on 16 occasions, or 71 percent of all instances of use by SDS. Asian SDS accounted for a fifth of overall use.

93. Both prior to and during the evaluation period, most EF support was provided to address post disaster recovery from tropical storms. Damages from these events as a share of GDP ranged from 4 percent (St. Vincent and the Grenadines, 2011) to 96 percent (Dominica, 2015)

²⁵ St. Lucia, received disbursements under RCF, approved on 12 January 2011 as well as under an ENDA arrangement, approved on 14 January 2011, to address the impacts of Cyclone Tomas.

²⁶ Note that five SDS, including Comoros (2008), St. Vincent and the Grenadines (2009), Dominica (2009), St. Lucia (2009) and Maldives (2009), utilized the Exogenous Shocks Facility (ESF) for emergency financing to address the impact of the Global Financial Crisis (i.e., not to address the impact of an ND). Only one SDS (Samoa, 2009), used this facility to help address the impact of a physical ND.

²⁷ Comoros, Dominica (twice), Samoa, St. Lucia, St. Vincent and the Grenadines (on three occasions) and Vanuatu.

(Table 11). These NDs often affected very high shares of the population, for example, well over half in St. Lucia (2012) and Vanuatu (2015). Fund emergency financing support to these members averaged 5.8 percent of damages incurred, ranging from 2 percent (St. Vincent and the Grenadines, 2011) to 10 percent of immediate flood-related damages (Dominica, 2015).²⁸ As could be expected, higher access was associated with a higher share of financing of the disaster: on average, the Fund emergency financing amounted to 1.7 percent of GDP, the highest access enjoyed by Vanuatu was equivalent to 3.1 percent of GDP against damages standing at about 60 percent.²⁹

Table 11. Emergency Financing for SDS: Scale of Damages and Fund Financing, 2011–2019

SDS	Event	Arrangement and Approval		Damage and Affected Population		Fund Financing		
				Losses (Percent of GDP)	Share of Population Affected (In percent)	SDR (m)	Share of Quota (In percent)	Share of ND Damages
St. Lucia	Hurricane	1/12/2011	RCF/ENDA	34	100	5.4	35	2.4
St. Vincent & the Grenadines	Hurricane	2/28/2011	RCF	11	28	2.1	25	6.5
St. Vincent & the Grenadines	Flood	7/25/2011	RCF	4	16	1.2	15	7.8
Dominica	Flood	1/11/2012	RCF	7	NA	2.1	25	10.0
Samoa	Cyclone	5/15/2013	RCF	30	7	5.8	50	4.1
St. Vincent & the Grenadines	Flood	8/1/2014	RCF/RFI Blend	15	16	4.2	50	5.9
Vanuatu	Cyclone	6/5/2015	RCF/RFI Blend	60	69	17.0	100	5.3
Dominica	Storm	10/28/2015	RCF	96	40	6.2	75	1.8
Comoros	Storm	7/24/2019	RCF/RFI Blend	13	41	8.9	50	8.2

Sources: Post-Disaster National Assessments; IMF Board Documents; EM-DAT; WEO; WDI; authors' calculations.

94. The scale of SDS' use of EF for NDs has increased over time. In the three-decade period from 1979–1999, financing for the five ND emergency drawings approved for SDS averaged SDR 1.2 million. Between 2000–2009, the level of borrowing increased to an average of SDR 4.9 million per drawing, rising further to SDR 5.3 million during 2010–2019. By contrast, 14 EF drawings for COVID-19 pandemic support to SDS in 2020 averaged SDR 33.5 million.

95. Several factors accounted for the increases. In particular, the rise in percent of quota share of each EF drawing reflected an increase in maximum access limits on an annual and cumulative basis. Between 1979–2012, the share of quota drawn exceeded 25 percent of quota in only three of 16 arrangements, while from 2013, SDS drew at least 50 percent of quota in all EF

²⁸ Dominica, 2012: EBS 11/114.

²⁹ Prior to approval, Dominica's cumulative outstanding emergency lending amounted to 57 percent of quota compared to a limit of 150 percent. Staff considered access of 75 percent of quota under the RCF, equivalent to 1.61 percent of GDP, to be appropriate as total outstanding PRGT credit under emergency assistance instruments would increase to 132 percent of quota.

drawings. For emergency financing to help members finance their response to the COVID-19 pandemic, average access levels surged to 91 percent, reflecting the large temporary increases in annual and cumulative access limits for Fund emergency facilities in response to the pandemic.

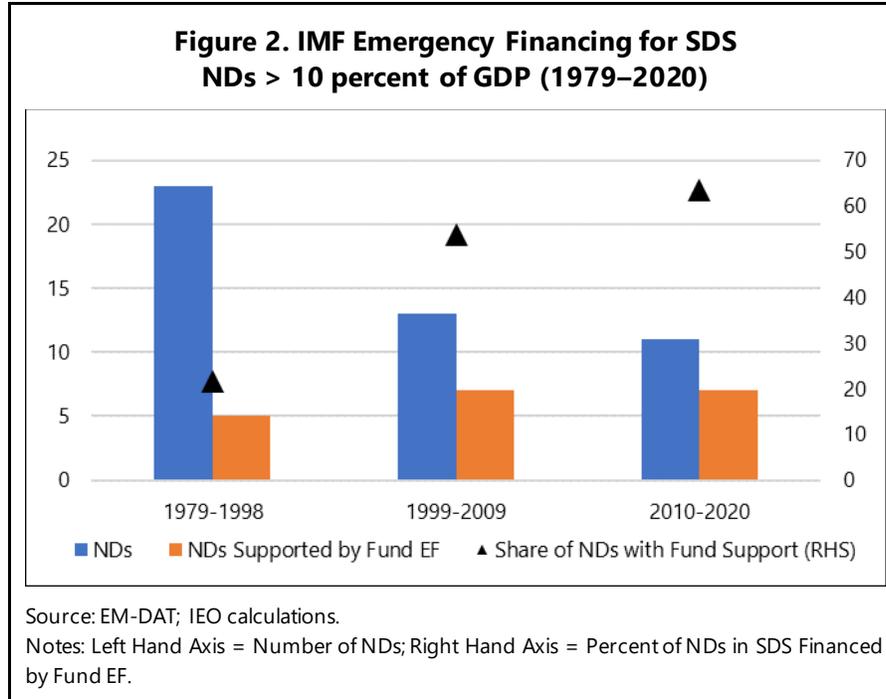
96. IMF emergency facilities allow for repeat use under specific conditions.³⁰ The evaluation reviewed the experience of the nine SDS that borrowed under the Fund's emergency financing instruments, to assess whether SDS chose to approach the Fund for repeat use of these instruments, on occasions when subsequent NDs hit (Annex Table AIII.3). Collectively, these 9 SDS experienced a combined total of 14 further NDs within three years of the initial EF disbursement. Of these events, 11 NDs incurred damages of between zero percent and 2 percent of GDP. In none of these instances did authorities opt to request repeat use. Authorities may have considered the bureaucratic effort in applying for repeat use not to have been worthwhile.

97. The three remaining NDs were much more severe. Among these, St. Vincent and the Grenadines requested an additional RCF disbursement in 2011, six months after its first emergency operation, following a second ND event; and a further RCF/RFI disbursement in 2014, to help support recovery from a third large ND, very shortly after the 2011 RCF was disbursed. In the case of Dominica, the country was unable to make repeat requests because its cumulative access limit under the RCF had already been reached.

98. Cross-referencing the instances of Fund financing to SDS with the list of countries experiencing severe NDs with estimated damages greater than 10 percent of GDP shows that the share of severe ND events supported by Fund financing has grown over time (Figure 2 and Annex Table AIII.6). IMF financing was used to support only around 22 percent (5 of 23) NDs affecting SDS with damages greater than 10 percent of GDP between 1979–1998. The new emergency facilities introduced from 1995 to support members' post-disaster recovery enabled the Fund EF to support around 40 percent of SDS experiencing severe NDs. Between 2010–2020, EF was provided in 7 of 11 NDs incurring damages greater than 10 percent of GDP.

99. During the evaluation period, there were a further seven EF drawings after 11 ND events incurring damage greater than 10 percent of GDP. The four cases without an EF drawing all occurring in 2016–2019, included Dominica which experienced a hurricane with damages of 226 percent of GDP, but was unable to utilize emergency financing as the cumulative access limit for drawdowns under the RCF had been reached. The other three cases were Antigua and Barbuda, the Bahamas, and Fiji.

³⁰ Repeat use is permitted if a member has received an RCF/RFI disbursement with the preceding three-year period, provided that an additional RCF/RFI disbursement may only be approved in case of an urgent BOP need qualifying for the exogenous shock or ND window or an established track record of adequate macroeconomic policies over a period of six months immediately prior to the request.



100. While the proportion of countries affected by severe NDs supported by Fund emergency financing has increased, the fact that a considerable number of SDS did not approach the Fund for emergency financing, despite experiencing large ND shocks still seems puzzling. Interviews with country authorities shed some light on this issue. They highlighted that when NDs occur, they could be catastrophic, incur large damages to economic and social infrastructure, necessitate diversion of policy makers' attention to emergency relief efforts, and set back countries economic development efforts. They welcomed the responsiveness of the Fund and some highlighted that the Fund was often particularly prompt in responding, through missions and subsequent preparation of board documentation for member's emergency financing requests. However, they suggested various reasons why countries may not have approached the Fund for EF support, including a sense of stigma in approaching the Fund from previous negative experience with Fund-supported programs; a lack of knowledge and familiarity with the Fund's EF toolkit; the availability of substantially greater quick-disbursing and more concessional alternative sources of non-Fund EF; and perceptions that the amount of resources available could be too small to be worth the bureaucratic effort of applying for.

Review of ND Emergency Financing Documents

101. Documents presented for requests for these SDS EF drawings were reviewed to assess the quality, coverage and relevance to SDS, of staff analysis and policy assessments in these documents. The assessment scored ND EF request documents according to several criteria, including criteria included in assessments of all financing requests ("standard criteria") and some additional criteria identified in external literature, Fund research and policy papers as well as Board members as factors that have particular relevance and consequence to the effectiveness of

Fund engagement with SDS members and which constitute important components of a sound qualitative and quantitative assessment of the appropriateness of emergency lending to SDS when hit by NDs (“SDS-specific criteria”). Arrangements were subsequently scored and grouped among those with high, moderate and low scores. Further details are included in Annex II.

102. Results of this exercise show that the content, depth and quality of analysis of analytical and policy issues covered in documents requesting EF for SDS strengthened considerably over the evaluation period. Coverage of standard criteria improved steadily. Between 2011–2014, program documents for financial requests for St. Lucia (2011), St. Vincent and the Grenadines (February 2011, July 2011) and Dominica (2012) reflected reasonable efforts by staff to address members’ prospects for recovery from the ND event, discuss post-ND financing gaps and apply Fund assessment tools including the DSA. However little attention was paid to longer-term potential need for subsequent UCT Fund arrangements.³¹ Coverage in subsequent requests for approval strengthened, notably in documents for Vanuatu (2015), Dominica (2015) and Comoros (2019). All these request documents provided enhanced analysis of SDS’ short-term and longer-term prospects for recovery, including analysis of risks, rehabilitation and recovery plans; further detail on estimated financing gaps and how these could be addressed. Request documents for Vanuatu (2015), Dominica (2015) and Comoros (2019) also provided more granular detail on the application of the Fund’s surveillance tools, including DSAs and RAM; and on SDS’ capacity to repay the Fund. However, throughout the period, attention was limited, on prospects and challenges for SDS in considering the need for longer-term UCT-level program engagement.

Assessment

103. Three features of SDS’ use of Fund emergency facilities stand out. First, the number of uses has increased substantially. Few SDS approached the Fund for financing related to severe NDs prior to 1995, largely due to the absence of special facilities to provide finance for NDs with no ex-post conditionality. But following the establishment of such facilities in 1995 and subsequent reforms to these facilities, a much higher proportion of severe ND events were supported using the Fund’s emergency ND facilities, including during the evaluation period.

104. Second, amounts drawn have increased, covering a higher share of ND damages. An important factor contributing to this has been increases in both annual and cumulative access limits for the Funds’ EF facilities.

105. Third, notwithstanding improvements in the design of EF instruments, and increases in annual and cumulative access limits, a considerable number of all SDS have not thus far utilized emergency financing, some of these despite facing LNDs. Interviews with country authorities

³¹ Coverage in Dominica’s 2012 Request for Approval was an exception: staff noted that repeated use of the RCF and narrowing of space for any future emergency IMF financing underscored the need to address the underlying structural vulnerabilities and build buffers to strengthen the country’s resilience and ability to respond to such shocks in the future.

suggest a number of reasons, including stigma, alternative sources of financing, and that access limits may not be high enough to persuade SDS members to incur the costs of using IMF emergency financing, notwithstanding the absence of ex post conditionality.

B. Program Lending

106. During the evaluation period 2010–2020, in addition to the 9 EF drawings to deal with physical NDs assessed in the preceding sub-section and 14 EF drawings to help address the COVID-19 pandemic in 2020, SDS also borrowed under 19 Fund arrangements, including 7 using GRA resources and 12 using PRGT resources (Annex Figure AIV.1 and Annex Table AIII.1).³² SDS members also benefitted from non-financial instruments, including the Policy Coordination Instrument (PCI) and Policy Support Instrument (PSI) on four occasions.³³

107. None of these 19 programs and 4 non-financial instruments were initiated as a direct response to the impact of an ND. When severe NDs occurred, SDS tended to approach the Fund for emergency financing rather than program support.³⁴ On two occasions during the evaluation period, existing programs were augmented to provide post-disaster financing support to SDS hit by NDs. Djibouti's 2012 ECF arrangement was augmented to finance recovery from drought and Dominica's 2009 ECF arrangement was augmented in [2010] to finance post-hurricane recovery.³⁵ In addition, the 2012 ECF for the Solomon Islands was adapted to help address the impact of an ND that occurred subsequent to commencement of the program, although access was not increased.

108. A detailed desk review of a sample of 11 of these programs, including 8 IMF-supported programs and 3 non-financial instruments, considered the extent to which these programs made reference to building resilience to ND&CC in developing frameworks for macroeconomic stability and addressing structural constraints to growth.

109. This review found that little reference was made to ND&CC issues in program design in the first half of the evaluation period. For instance, while growth was a constant concern in the 2009–2013 Extended Fund Facility (EFF) with Seychelles, there was no meaningful reference to policies to address CC effects. The arrangement fulfilled its aim of fostering macroeconomic

³² Includes five programs approved prior to 2010 with drawings in 2010 or after.

³³ Non-financial instruments were used for Cabo Verde (PSI, 2006 with the instrument covering the period to 2010; and PSI, 2010); Cabo Verde (PCI, 2019), and Seychelles (PCI, 2017).

³⁴ All total, during the evaluation period, 18 SDS chose not to request Fund financing for any purpose, including in response to NDs. These SDS experienced 59 ND events, mostly with damages-to-GDP of between 0–2 percent, although also including two events with damages of up to 5 percent of GDP and two more exceeding 10 percent (Annex Table AIII.5).

³⁵ For the 19 Fund-supported programs for SDS approved during the evaluation period, a cross-referencing of incidence of ND events during the program period shows that NDs occurred during the respective program in only three instances, in each case for an ND of less than 2 percent of damages-to-GDP (Annex Table AIII.4).

stability and laid the ground for solid growth, by achieving a substantial reduction in the debt burden, promoting a build-up in international reserves, and improving fiscal capacity. It is only towards the end of the arrangement that NDs were appraised as a risk, for which the authorities were advised to continue to build policy buffers and explore options for ND insurance. Similarly, in 2014 Grenada requested an ECF that recognized the specific features of a small economy and noted that NDs threatened conditions for high-quality growth. In a similar vein, when the Solomon Islands requested a precautionary SCF in 2011, program documents noted at the outset that CC vulnerabilities could have a negative impact on economic prospects, particularly by affecting incomes and food security in rural areas through increased water salinity, especially in the outer islands. But there were no specific elements in either of these programs related to CC. This observation is consistent with the thrust of the interviews held with senior staff who underscored the limited expertise of their teams on CC especially in the earlier years of the evaluation window.

110. While disaster resilience policies were not incorporated into initial program design, there were occasions on which programs were adjusted flexibly ex post to respond to the incidence of an ND. Indeed, this flexibility in the toolkit was emphasized by senior staff interviewed as providing a framework to address vulnerabilities stemming from ND&CC. As a case in point, when the 2012 ECF for the Solomon Islands was approved, the Board documents emphasized the need to improve the economy's resilience by implementing prudent policies that would rebuild and protect policy buffers, alongside structural reforms to strengthen key public institutions. Following unprecedented floods in Solomon Islands' capital two years later, the program framework was rapidly adapted, taking advantage of the fiscal space (re-)built in previous years to help fund reconstruction and much-needed capital projects, even though access was not augmented. Building on that, the arrangement saw an opportunity to accelerate strategies aimed at climate adaptation and mitigation, including infrastructure improvements within a realistic medium-term fiscal framework. Subsequently, the ECF incorporated the country's vulnerability to ND&CC into the DSA, assessing how they would impact fiscal and external sustainability.

111. In the second half of the evaluation period, Fund-supported programs paid somewhat more attention to incorporate ND&CC-related vulnerabilities, albeit with some unevenness. Program documents became more explicit in relating risks, objectives, and the overall design to those vulnerabilities. Nevertheless, conditionality was not formulated with specific reference to ND&CC. The recent 2019 PCI with Cabo Verde illustrates this point. The eighteen-month non-financial arrangement sought to enhance macroeconomic stability, with program documents noting potential weather-related shocks that could be mitigated through prudent policies. In a similar vein, the ensuing review pointed to fiscal and growth-enhancing reforms, while acknowledging the need to build resilience to weather-related shocks. However, there was no meaningful further elaboration on specific policy implications.

112. As noted by the IMF (2019a) review, the introduction of the CCPA offered the potential for tailoring conditions in Fund arrangements to ND&CC vulnerability. This was emphasized in

interviews held with senior staff who pointed to CCPA as providing a critical mass of knowledge to draw from to better inform program design. However, this potential has yet to be realized. Of the six SDS who received a CCPA, three (Belize, Micronesia, and Tonga) have not subsequently used IMF programs. Even in the three cases that used IMF financing (Grenada, St. Lucia, and Seychelles) the extent to which their respective arrangements have leveraged on the CCPA was limited. For instance, in 2017 Seychelles embarked on a PCI that underlined the need to build resilience. Within that framework, staff drew from the CCPA to reiterate the benefits of a gradual introduction of a carbon tax as part of a comprehensive tax reform aimed at creating further fiscal space to accommodate climate-resilient investment and advised the authorities on their CC mitigation and adaptation investment projects. However, program conditionality was not directly related to ND&CC effects.

113. Table 12 uses a heatmap to summarize findings of the desk review of the evolution of treatment of vulnerabilities stemming from ND&CC. More specifically, the indicators capture whether the impact of ND&CC effects: (i) were featured as risks in the documents about the arrangement; (ii) were explicitly embedded in the DSA; and (iii) whether ND&CC broadly informed fiscal program design. Each of these variables was assessed on a simple binary scale, with “yes” equal to one and “no” equal to zero. The scoring exercise confirms the broad improvements in terms of greater awareness of ND&CC in program work over time. This is particularly the case of those CCPA countries (Grenada and Seychelles), but also non-CCPA ones, like the Solomon Islands.

Country	Facility	Date of Approval	Expiration Date	CCPA (year)	ND&CC risk assessed	ND&CC incorporated in fiscal policies	ND&CC DSA	NC & CC incorporated in broader assessment	Total Score
Maldives*	SBA	12/4/2009	12/3/2012						-
Seychelles	EFF	12/23/2009	12/22/2013	2017	1	1	0	0	2
Grenada	ECF	4/18/2010	4/17/2013	2019	1	0	0	1	2
Solomon Islands	SCF	6/2/2010	12/1/2011		0	0	0	1	1
Cabo Verde	PSI	11/22/2010	2/21/2012		0	0	0	0	0
Solomon Islands	SCF	12/6/2011	12/5/2012		1	0	0	1	2
Solomon Islands	ECF	12/7/2012	3/31/2016		1	1	1	1	4
Seychelles	EFF	6/4/2014	6/3/2017	2017	0	0	0	0	0
Grenada	ECF	6/26/2014	5/26/2017	2019	1	1	1	1	4
Seychelles	PCI	12/13/2017	12/12/2020	2017	1	1	0	1	3
Cabo Verde	PCI	7/15/2019	1/15/2021		1	1	0	1	3

Source: Program documents 2009–2020; authors' calculations.
 Note: CCPA year is in blue for facilities approved in the same year or later; 1=Yes, 0=No. Refer to main text for taxonomy criteria.
 (*)=program documents confidential.

114. When providing program support, the Fund typically interacted with multilateral lenders and donors to catalyze donor assistance and to coordinate capacity development support. For example, in the Solomon Islands, the 2012 program played a role in triggering donor assistance for dealing with reconstruction needs of the hurricane, beyond disaster-triggered reconstruction needs, while later reviews constructively outlined areas of future engagement for the Fund and development partners.

115. The level of interaction with other lenders and donors became more relevant as the Fund built knowledge on ND&CC issues. Early in the evaluation period, following up one of the greatest hurricanes ever recorded in the North American basin, Grenada's 2014 ECF did note NDs as a risk but recommended working with the World Bank in the long term to build resilience to CC. However, more recently in Seychelles, at the time the CCPA was conducted, the 2017 PCI included in its framework a World Bank-sponsored project of the Blue Economy. More broadly, the PCI supported increased value addition in the aquaculture, industrial, semi-industrial, and artisanal fishing and processing sectors, so as to diversify the sources of growth in the medium term.

Assessment

116. During the evaluation period, while SDS utilized EF on nine occasions in response to ND events, no SDS chose to request a Fund arrangement in response to the ND. On three occasions, existing programs were augmented after NDs occurred or the macroeconomic framework was adapted to provide resources to fund reconstruction costs. This experience suggests that SDS have generally not found an IMF-supported program as an attractive option for meeting post-disaster reconstruction needs.

117. Program support to SDS during the evaluation period more generally aimed to provide a framework for pursuing and maintaining macroeconomic stability, addressing structural constraints to lifting growth potential, and managing fiscal risks. While objectives and design of arrangements were broadly consistent with addressing vulnerabilities to ND&CC, they were generally not integrated into the program's macroeconomic framework or conditionality, particularly in the first half of the evaluation period. Over time, program documents tended to become more explicit about the appraisal of ND&CC-related vulnerabilities, as confirmed by a greater effort in terms of relating risks, objectives, and program design, particularly in countries that had benefitted from CCPAs. Even then, however, program conditionality was not formulated with specific reference to ND&CC.

118. This evidence points to unexploited potential of program design in responding to ND&CC-related vulnerabilities.

VII. DISASTER RESILIENCE STRATEGIES

119. Building on the Fund's increasing attention to ND&CC issues, in 2019, a Board paper (IMF, 2019a) developed an organizing framework for supporting resilience building in disaster-vulnerable countries. Emphasizing benefits of taking early actions to enhance resilience and against the backdrop of substantial underinvestment, the Fund recommended that vulnerable countries build disaster resilience through a three-pillar strategy aimed at structural, financial, and post-disaster resilience (Box 3). Disaster resilience strategies (DRS) are intended to serve a three-fold purpose: (i) domestically, bringing greater strategic and operational consistency to ongoing initiatives and projects across the three conceptually-distinct pillars, by providing a unifying standard; (ii) promoting greater harmonization in the disaster-resilience-based interventions from multilateral lenders and donors, leveraging on a clearly-articulated country-owned strategy; and, finally, (iii) highlighting innovative products and best practices in disaster resilience and incorporating them across countries.

120. In launching this new framework, the Fund recognized that such strategies could inform its surveillance work by reflecting disaster costs and returns from resilient investment into the macroeconomic framework. Accordingly, assessing the macro-fiscal implications from resilience-building strategies could contribute to reassure official creditors and market participants that a strategy is viable. For the Fund, called on to provide input into their formulation, DRS provide an organizing framework for generating further knowledge on the macroeconomic impact of ND&CC effects, focusing on the shorter-term implications of climate adaption.

121. A review of the two DRS completed so far—those of Grenada (2020) and Dominica (2020)—suggests that they were helpful in terms of costing a climate-resilience strategy by providing a holistic and internally-consistent framework for appraising the various, interrelated components. The DRS process for these countries also triggered the underlying administrative process within their respective governments; they built upon—and brought consistency among—a wide array of domestic sectoral strategies, plans, and projects already launched by setting a common, unifying standard under which to appraise, amend, and then implement them. They also drew from—and successfully built upon—initiatives sponsored by multilateral institutions and development partners.

122. Specifically, the two DRS drew from a number of national strategic documents, with a significant linkage with Fund and Bank work. In the case of Dominica, the DRS drew from surveillance and for Grenada from its CCPA. This is particularly evident in the macroeconomic framework that provided a macro-fiscal translation of the DRS's overall goals and analytical work to assess the risk management strategy.

Box 3. Managing Natural Disaster Vulnerability Through Disaster Resilience Strategies

Recognizing the macro-criticality of climate-related disasters, the Fund has developed the Disaster Resilience Strategy (DRS) framework as an organizing framework to provide advice and assess financing needs associated with managing vulnerabilities related to NDs. The goal is to develop a country-owned resilience-focused document drawing on national processes, strategies, plans, as well as CCPA (if available). Serving as an umbrella strategy, DRSs help integrate macro and micro reforms for building resilience and prioritizing policies and actions.

The DRS centers on three pillars. The first pillar is **structural resilience** consisting of ‘hard’ investment in infrastructure as well as “soft” investment such as, for instance, building codes and zoning rules. Typically, such investment is insufficiently prioritized. Especially for its hard component, costs are upfront while benefits accrue over a longer time horizon. The latter mostly consist of increasing returns from private investment, employment and output while reducing expected losses from NDs. As the scale of high-return resilience building projects may be much larger than can realistically be financed through fiscal policy adjustment and prudent commercial borrowing, supporting investment in resilience can produce net savings for donors—savings that Fund economists estimate to the tune of 10 to 14 percent of the recipient’s GDP under appropriate assumptions (see Wei and Saad, 2020).

Even then, the impact of disasters can be contained but not eliminated. Accordingly, vulnerable countries still need to manage the financial costs of NDs through the **financial resilience** pillar. The latter relies on a multi-instrument strategy aimed at securing ex ante financing through self-insurance, risk transfer, contingent financing and external assistance for large and rare disasters. In terms of contingent financing, the World Bank and a number of regional development banks have developed contingent arrangements conditional on a sound policy framework. Still, SDS face underinsurance on account of underdeveloped private markets as well as costly products, including those offered by the official sector. Accordingly, diversifying risk further and developing additional risk transfer products may reduce disaster costs and expand coverage of (parametric) insurance.

Finally, the third pillar centers on **post-disaster resilience**. When a disaster strikes, the country in question should be able to rely on a detailed emergency response plan clarifying institutional arrangements and responsibilities so as to rapidly mobilize and deploy financial and physical resources to mitigate the disruption caused by the natural disaster.

Focusing on disaster resilience through a more holistic approach is intended to facilitate greater coordination among domestic stakeholders, lenders and donors. In that setting, the Fund sees scope for developing the macro-fiscal aspects of disaster resilience by integrating fiscal and debt sustainability into a medium-term macroeconomic framework that would incorporate required investments and advice on financing strategies. As envisaged, IMF endorsement of the macroeconomic framework would boost the willingness of official partners and market participants to provide support as well as financing. For instance, climate funds could ease administrative requirements to provide financing. As for lending, the approach leverages on the intrinsic flexibility of the Fund’s lending framework with conditionality focusing on resilience-building measures. Capacity building would be offered to facilitate achievements of DRS goals.

So far, Dominica and Grenada have developed DRS that were discussed by the Board in 2021. These strategies were developed by country authorities, with IMF support. They benefited from comments provided by key partners, including the World Bank.

Source: IMF (2019b; 2021b).

123. In Dominica, the macro-fiscal framework significantly built upon the Fund's work in the context of both country-based and regional surveillance.³⁶ A DSGE model employed for regional surveillance was calibrated to its economy to lay down the analytical foundations and assess the costs and benefits, over time, on real and fiscal returns from resilient investment. The conclusion was that benefits would outweigh cost in the longer term with the high cost of resilient investment worsening the fiscal balance in the shorter term. As fiscal consolidation alone would be unable to sustain the execution of the DRS, substantial additional support on concessional terms would, thus, be needed.

124. Still in the case of Dominica, drawing from the 2018 IMF ECCU regional consultation report, the DRS simulated the impact of ND shocks to assess the response of output and government revenues and expenditures, so as to assess the adequacy of its layered framework. In line with the approach suggested in the 2018 report, regional options were considered to insure against extreme disasters on more competitive terms. Even so, however, the risk-layering framework would entail an annual fiscal cost of more than 2 percent of GDP, which would need to be adequately funded. Like Dominica's, Grenada's risk management assessment also drew from regional surveillance.

125. The DRS also drew from both analytical work by the World Bank as well as innovative lending products being developed by the Bank. Along these lines, Grenada's DRS generated momentum in optimizing the risk-layered financing framework, as the World Bank's CAT-DDO³⁷—the first for the Latin America and Caribbean Region by IDA, the concessional arm—was approved just weeks before the DRS. The Disaster Risk Financing Strategy and other aspects of disaster risk management were already being pursued with support from the World Bank.

126. Finally, DRS were instrumental in incorporating or underscoring some best practices from other countries. For instance, in Grenada (2020), the adoption of the Antigua and Barbuda declaration on school safety was highlighted to increase, among other things, awareness on resilience within the school community. In a similar vein, its DRS also underscored the experience of Dominica, which had created a specialized agency to coordinate reconstruction efforts, leading to their fast-track implementation.

127. While the DRS benefitted from a compelling analysis of the macroeconomics of resilience, drawing from Fund surveillance and underlying research, what was left unclear was how the partners—including the IMF, which had proactively supported the drafting of such documents—would follow up on the intended aims of the DRS. For instance, Grenada's DRS acknowledged that public infrastructure investments to meet development needs competed with

³⁶ As there were no consultations for Dominica in the year 2020, the reverse link from the DRS to surveillance could not be assessed.

³⁷ The Development Policy Loan with Catastrophe Deferred Drawdown Option (Cat DDO) is a contingent credit line providing immediate liquidity to a country hit by an ND. More details are available at: <https://web.worldbank.org/archive/website01265/WEB/IMAGES/CATDDOPR.PDF>.

resilience building. At a broader level, while the required financing envelope was carefully assessed with the DRS providing a platform for identifying financing and its composition, how to fill the identified gap remains unclear—not just in terms of partners’ support but also as to how the Fund could leverage on its catalytic role to mobilize the required funding. In Dominica, a similar exercise appraised at approximately five times the country’s GDP the overall resource envelope needed to finance the transition towards a fully resilient economy. It also made clear that the country would be unable to finance the cost of building resilience without international support of the scale 2-3 times above previous levels.

128. Modest steps were taken, following completion of the DRS, including an IMF-organized event during the Spring Meetings with SDS prime ministers and representatives of the donor and insurance communities meeting to discuss financing access and a Caribbean Forum in Barbados to discuss DRS. However, consistent with their nature and purpose, DRS would have greater leverage if the appraisal of the size and composition of financing fostered greater follow through, including with the Fund, once a country’s DRS is fully endorsed. However, the discussion of this aspect in the country documents to date have been tilted towards a possible easing of administrative requirements to facilitate access, rather than raising additional resources. To fully achieve the objectives laid down in the 2019 concept paper, partners—starting from the IMF itself—will need to pay further attention to how to operationalize the mobilization of needed financing support, following their endorsement. This would render the DRS truly forward-looking, consistent with their strategic nature.

VIII. CONCLUSIONS

129. Attention to ND&CC issues in IMF work on SDS has grown in depth and consistency over time. This conclusion is borne out in the areas of research, surveillance and programs. However, attention has been somewhat uneven, particularly in the use of Fund financing, suggesting potential for further strengthening the IMF’s support to SDS on those issues.

130. Building on initial work by academia, the World Bank, and the UNCCP, IMF economists focused their research contributions on aspects most relevant to the Fund’s own mandate, generating country-based evidence, appraising country policy experience, and developing new standards and templates for country work. Consistent with the Fund’s expertise and mandate, Fund economists focused on the macroeconomics of disasters and recovery, the impact on growth and the need for resilience-building and disaster preparedness, underscoring the importance of a proactive policy stance.

131. The relevance of IMF research contributions was two-fold. In the first place, they highlighted the need for the Fund’s own policy guidance to change. Indeed, the research efforts built considerable momentum, internally triggering increasing emphasis on ND&CC in work on SDS, including with the initial 2014 Staff Guidance Note on the Fund’s Engagement with SDS, the assessment of the macro criticality of ND&CC, potentially far-reaching new tools such as the

CCPA and, a bit later, the DRS. Secondly, the research efforts brought about the refinement of relevant analytical and diagnostic tools such as the DSA, for ND&CC impacts.

132. Surveillance work on ND&CC issues was informed by broad policy guidance, establishing best practices, and upgrading internal templates, which benefitted from research as well as the review of country experience. Attention in the early years of the evaluation period to ND&CC issues was quite sporadic. However, it deepened considerably after the 2014 SGN and, especially, following the introduction of the CCPA. Particularly in countries receiving a CCPA, analysis of ND&CC effects was built into the frameworks for assessing macroeconomic policies; DSAs for these countries systematically included stress testing accounting for the impact of NDs; and growth projections and fiscal policy advice were calibrated to reflect ND&CC concerns. Consistent with that, policy discussions featured relevant treatment of disaster preparedness and resilience building, elaborating on measures to boost resilience against, and to manage the risk of ND&CC effects. In sum, CCPAs have emerged as a galvanizing framework, internally, for building a critical mass of knowledge, organizing efforts and innovating on the delivery of surveillance; and, externally, for engaging with partners and country authorities on macro critical issues. In two cases, the broader DRS framework has provided the basis for further developing a three-part policy framework for building resilience and costing resource needs, although the financial follow-through was not operationalized.

133. In countries that did not benefit from a CCPA and DRS, evidence reviewed in this paper suggests that coverage of the impact of ND&CC effects improved over time but lacked the specificity and depth of the CCPA/DRS cases. A notable exception is the Solomon Islands, whose consultations consistently addressed ND&CC issues, particularly in the latter part of the evaluation window after the 2012 ECF was augmented to address the consequences of a tsunami. This experience suggests a need to build the Fund's capacity to extend more in-depth ND&CC work to its SDS members.

134. Turning to lending, the Fund framework for providing financing for NDs has evolved incrementally mainly through repeated increases in access to its emergency facilities. As a result, its capacity to provide not only fast, but also larger, disbursements in the aftermath of a disaster have increased through time, especially in the later years of the evaluation window, and this has been reflected in increasing use of emergency drawings by countries inflicted by LNDs. However, such access is still quite limited as a share of quota, implying that the Fund can only provide for a relatively small share of post-disaster financing needs. Use of Fund-supported programs could offer higher access, but in practice, countries chose not to use such programs with ex post conditionality as a source of financial support in the wake of an ND, although program access was augmented on two occasions. Indeed, some countries experiencing large NDs chose not to request IMF financing at all, although they still counted on positive IMF assessments to support access to financing from other sources.

135. This experience raises the question of whether access limits under the Fund's emergency financing for dealing with LNDs could be raised further above the current normal annual access limit of 80 percent for a LND to 100 percent as provided (temporarily) for COVID-19 pandemic support or even further. The Fund's approach taken in setting access to emergency financing has been cautious, seeking to ensure appropriate safeguards and setting access limits at levels that did not raise doubts about capacity to repay, which meant that resources available from IMF emergency financing without ex post conditionality remained quite low relative to the scale of the ND shock. Even the special window for LNDs has access capped at 80 percent of quota. Consideration might be given to allowing for increased access to EF above current limits for countries judged as having suitably robust macroeconomic policy frameworks and governance safeguards.

136. Turning to program financing, until very recently, there has been little effort towards adapting the lending toolkit and program design to operationally support disaster resilience-building policies. Most IMF programs to SDS during the evaluation period were directed at addressing short-term policy adjustment needs, with little attention to encouraging longer-term ND&CC resilience building. This approach did not fully leverage the knowledge generated by the substantial research and policy analysis, developed by the Fund to better understand and support SDS, in surveillance work.

137. That said, over time, programs tended to become more explicit about the appraisal of those ND&CC vulnerabilities, as confirmed by a greater effort in terms of relating risks, objectives, and the overall design of those arrangements to them. But even then, program conditions generally did not include specific and direct reference to ND&CC. This seems to be a missed opportunity. Going forward, Fund arrangements with SDS prone to NDs should pay more systematic attention to ND risks and resilience needs in program design and conditionality.

138. A key outstanding issue is the role of the Fund in mobilizing financing to meet the long-term investment needs to build resilience to ND&CC, as analyzed in CCPA and DRS exercises. Neither of these tools has brought a direct connection to access to Fund lending. While the DRS in particular provides an in-depth analysis of the size and composition of the funding envelope required to fund the transition towards a disaster-resilient economy, the Fund has not explored the full implications for its lending activities.

139. The envisaged Resilience and Sustainability Trust, now under discussion, provides an important opportunity to scale up resources to support SDS' ND&CC-related challenges by offering resources at a below market rate for longer repayment periods than available on resources from the GRA and PRGT. Such access—which would be provided in the context of a program with UCT conditionality—would provide more resources on better terms more aligned with the longer-term needs of resilience building.

140. In concluding, the Fund has been effective in pioneering work related to the macro-criticality of ND&CC with a selected group of SDS with which it has collaboratively developed innovative products (i.e., CCPA and its pilot cases), set best practice standards (i.e., DRS of Dominica and Grenada), and innovated on the ground (Solomon Islands). Looking forward, the challenge is to build on success with these 'champions' by mainstreaming these approaches horizontally to the broader group of SDS and vertically to the full spectrum of the Fund's own core activities, including providing greater access to lending to meet SDS needs related to ND&CC issues.

ANNEX I. SDS' VULNERABILITY BY TYPE OF ND

A review of all NDs recorded by CRED between 1950–2020 shows that SDS tended to be more greatly affected than non-SDS members by the impacts of almost all types of NDs. The review compared the number of times a particular type of ND hit SDS during the period 1950–2020 to the experience of non-SDS. The analysis found that while all types of ND events were much more likely to occur in a given non-SDS than an SDS, when these events occurred, their impact as a share of GDP and in terms of share of population affected tended to be greater than the impacts of these events in non-SDS. On average, about 25 storms hit each non-SDS during the 70-year period from 1950–2020, compared to on average 17 storms that hit a given SDS. However, the impact on GDP and on the share of population affected was far greater among SDS members. (Table AI.1).

Types of Disaster	Disaster sub-category	Non SDS			SDS		
		Frequency Per Non-SDS	Average Damages/GDP	Average Affected/Pop	Frequency Per SDS	Average Damages/GDP	Average Affected/Pop
Climatological	Drought	4.3	1,0	13,0	1,4	1,9	35,9
Climatological	Wildfire	2.8	1,1	0,3	0,2	14,9	0,3
Geophysical	Earthquake	7.6	1,6	0,8	0,9	9,5	1,9
Geophysical	Volcanic Activity	1.3	0,7	0,3	0,5	...	6,6
Meteorological	Storm	24.9	1,4	1,5	8,3	17,2	13,8
Meteorological	Extreme Temperature	3.8	0,5	1,5	0,1	0,5	0,7
Hydrological	Flood	33.4	0,5	1,1	2,7	2,6	6,5
Hydrological	Landslide	4.7	0,1
Biological	Epidemic & Other	9.8	0,6	0,2	1.3	...	1,0
Total		93,3	1,0	1,8	15,3	13,5	11,5

Sources: EM-DAT, WDI, WEO: EM-DAT; WDI; WEO. Sample period: 1950–2020.

ANNEX II. REVIEW OF ND EMERGENCY FINANCING DOCUMENTS

The evaluation reviewed documents presented for 10 SDS requests for ND EF to assess the quality, coverage and relevance to SDS of staff analysis and policy assessments in these documents. The assessment scored ND EF request documents according to several criteria, including (i) standard criteria included in assessments of all financing requests and (ii) SDS-specific criteria, identified in external literature, Fund research and policy papers as well as Board members as factors that have particular relevance and consequence to the effectiveness of Fund engagement with SDS members and which constitute important components of a sound qualitative and quantitative assessment of the appropriateness of emergency lending to SDS when hit by NDs.

Standard criteria included coverage of: (i) Prospects for recovery from NDs, including discussion of risks, assessment of members' rehabilitation and recovery plans, short and longer-term challenges to recovery; and realism of these assessments; (ii) Financing gaps, including quality and depth of analysis and discussion, how remaining financing gaps would be addressed; and discussion of non-traditional sources of financing, including reference to ND risk insurance; (iii) Surveillance toolkit, including effective application of the DSA, RAM and other surveillance tools; (iv) Capacity to repay the Fund and assessment of adequacy of Fund safeguards; (v) Longer-term program engagement, including assessment of appropriateness, implications and challenges related to UCT program engagement."

SDS-specific criteria included coverage of: (i) Longer-term resilience building challenges, including depth of analysis and/or discussion of challenges to resilience building, members' longer-term vulnerability to shocks, including recognition, diagnosis and options to address; and sector-specific impacts of NDs in SDS and consequences for sectoral recovery; (ii) SDS-related institutional capacity constraints, including public administrative constraints and limitations due to large fixed costs of government administration in SDS; (iii) Recognition of the macro-criticality of NDs and CC and reflection of staff guidance and policies that help SDS members address this challenge; (iv) Engagement and collaboration with development partners in the aftermath of NDs, including evidence of practical engagement, sharing of information, initiatives to collaborate and share information; (v) SDS policy guidance: reflection of and depth of coverage of SDS-related policy guidance.

Arrangements were subsequently scored and grouped among those with high, moderate and low scores. Scores were assigned as follows: Extensive coverage, analysis and tables (4); granular discussion, some analysis and tables (3); One or more paragraphs of discussion or reference, minimal or no analysis (2); Moderate discussion or reference, little or no detailed analysis (1); Little or no discussion or reference; no analysis (0).

ANNEX III. ADDITIONAL TABLES

Table AIII.1. IMF Program Financing for SDS, 2010–2020

Country	PRGT-eligible (Y/N)	Lending/Non-lending Arrangement	Account	Facility	COVID-19 Emer. Fin.	Precautionary (Y/N)	Date of Approval	Expiration Date	Length (Months)	Quota at approval	Total Amount Approved (SDR m)	Total Amount Approved (% of quota)	Actual Avg. Annual Access (% of quota)
Cabo Verde	Y	NL		PSI			7/31/2006	7/31/2010	48	9.6			
Cabo Verde	Y	NL		PSI			11/22/2010	2/21/2012	15	9.6			
Cabo Verde	Y	NL		PCI			7/15/2019	1/15/2021	18	23.7			
Grenada	Y		PRGF	PRGF			4/17/2006	4/16/2010	48	11.7	16.38	140	35
Grenada	Y		PRGT	ECF			4/18/2010	4/17/2013	36	11.7	8.78	75	25
Grenada	Y		PRGT	ECF			6/26/2014	5/26/2017	35	11.7	14.04	120	41
Maldives	Y		PRGF	ESF-HAC			12/4/2009	12/3/2011	24	8.2	8.20	100	50
Maldives	Y		GRA	SBA			12/4/2009	12/3/2012	36	8.2	49.20	600	200
Maldives	Y		PRGT	RCF	Y		4/22/2020			21.2	21.20	100	
Seychelles	N		GRA	EFF			12/23/2009	12/22/2013	48	9	26.4	300	75
Seychelles	N		GRA	EFF			6/4/2014	6/3/2017	36	11	11.4	105	35
Seychelles	N	NL		PCI			12/13/2017	12/12/2020	36	22.9			
Solomon Islands	Y		PRGT	SCF			6/2/2010	12/1/2011	18	10.4	12.48	120	80
Solomon Islands	Y		PRGT	SCF		Y	12/6/2011	12/5/2012	12	10.4	5.20	50	50
Solomon Islands	Y		PRGT	ECF			12/7/2012	3/31/2016	40	10.4	1.04	10	3
St. Lucia	Y		PRGT	ESF-RAC			7/27/2009			15.3	6.9	45	45
St. Lucia	Y		GRA	ENDA			1/12/2011			15.3	1.5	10	10

Source: IEO.

Table AIII.2. Surveillance Heat Map

Country		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bhutan	CCPA											
	Risks		0			0		0		0		
	DSA		0			0		0		0		
	Calibration of Fiscal Policies		0			0		0		0		
	Impact on Growth		0			0		0		0		
	Reference to other partners		1			1		1		0		
	Broad reference		1			1		0		0		
	Total score		2			2		1		0		
Cabo Verde	CCPA											
	Risks	0				0		0		0	0	
	DSA	0				0		0		0	0	1
	Calibration of Fiscal Policies	0				0		0		0	0	
	Impact on Growth	0				0		0		0	0	
	Reference to other partners	0				0		0		1	0	
	Broad reference	0				0		0		1	1	
	Total score	0				0		0		2	2	
Guyana	CCPA											
	Risks	0				0		0	0	0	0	
	DSA	0				0		0	0	0	0	
	Calibration of Fiscal Policies	0				0		0	0	0	0	
	Impact on Growth	0				0		0	0	0	0	
	Reference to other partners	1				1		1	1	1	1	
	Broad reference	1				1		0	1	1	1	
	Total score	2				2		1	2	2	2	
Maldives	CCPA											
	Risks	0	0			0		0	1		0	
	DSA	0	0			0		0	0		1	
	Calibration of Fiscal Policies	0	0			0		0	0		0	
	Impact on Growth	0	0			0		0	0		0	
	Reference to other partners	0	0			1		0	1		0	
	Broad reference	0	1			1		1	1		1	
	Total score	0	1			2		1	3		2	
Solomon Islands	CCPA											
	Risks		0	0				1	1	1	1	
	DSA		0	0				1	1	1	1	
	Calibration of Fiscal Policies		0	0				1	1	1	1	
	Impact on Growth		0	0				1	1	1	1	
	Reference to other partners		0	0				1	1	1	1	
	Broad reference		1	1				1	1	1	1	
	Total score		1	1				6	6	6	6	
Belize	CCPA									yes		
	Risks	1				1	0	0	1	1	1	
	DSA						0	0	0	1	1	
	Calibration of Fiscal Policies						0	0	0	1	1	
	Impact on Growth						1	1	1	1	1	
	Reference to other partners	1	1		1	1	0	1	1	1	1	
	Broad reference	1	1		1	1	0	0	1	1	1	
	Total score	3	2		2	3	1	2	4	6	6	

Table AIII.2. Surveillance Heat Map (concluded)

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Grenada (1)											
CCPA										yes	
Risks					1		1		1	1	
DSA					0		1		1	1	
Calibration of Fiscal Policies					0		1		1	1	
Impact on Growth					1		1		1	1	
Reference to other partners					1		1		1	1	
Broad reference					1		1		1	1	
Total score					4		6		6	6	
Micronesia											
CCPA										yes	
Risks			1			1				1	
DSA			0			0				1	
Calibration of Fiscal Policies			0			0				1	
Impact on Growth			0			0				1	
Reference to other partners			0			0				1	
Broad reference			0			0				1	
Total score			1			1				6	
St Lucia (2)											
CCPA									yes		
Risks		1				1			1	1	
DSA		1				0			1	1	
Calibration of Fiscal Policies		1				1			1	1	
Impact on Growth		1				1			1	1	
Reference to other partners		1				1			1	1	
Broad reference		0				1			1	1	
Total score		5				5			6	6	
Seychelles											
CCPA								yes			
Risks	0		1		0			1		1	
DSA	0		0		0			1		1	
Calibration of Fiscal Policies	0		0		0			1		1	
Impact on Growth	0		0		0			1		1	
Reference to other partners	1		0		0			1		1	
Broad reference	0		0		1			1		1	
Total score	1		1		1			6		6	
Tonga											yes
CCPA											yes
Risks	0	1	1	1	1	1	1	1			
DSA	0	0	0	0	0	0	1	1			
Calibration of Fiscal Policies	0	0	1	1	1	1	1	1			
Impact on Growth	0	0	0	0	1	1	1	1			
Reference to other partners	1	1	1	1	1	1	1	1			
Broad reference	1	1	1	0	0	0	1	1			
Total score	2	3	4	3	4	4	6	6			

Source: Article IV Surveillance Reports (2010–2019)

Note: (1) = 2012 and 2014 Article IV Consultations were not published; (2) = 2012 Consultations not published.

Total Score= 0, 1 2,3,4 5,6

NB: Refer to main text for taxonomy criteria.

Table AIII.3. SDS: Emergency Financing Operations (2010–2020)

SDS	Type	Facility	Disbursement	Share of Quota Disbursed (In percent)	Remaining Share of Quota ¹	Losses (In percent of GDP)	Share of Population Affected (In percent)	Motivation for Repeat Use: Number of Other ND Events 2010–2020 within 3 years of first approval (Damages as percent of GDP)					
								1-2	2-5	5-10	>10	Total	
Comoros	PRGT/GRA	RCF/RFI	7/24/2019	35	45	13	41	0					0
Dominica	PRGT	RCF	1/12/2011	25	75	7	N/A	0					0
Dominica	PRGT	RCF	10/28/2015	75	0	96	40					1	1
Samoa	PRGT	RCF	5/14/2013	50	50	30	7	1					1
St. Lucia	PRGT	RCF/END	1/12/2011	35	65	34	100	4					4
St. Vincent and the Grenadines	PRGT	RCF	2/28/2011	25	75	11	28	1	1				2
St. Vincent and the Grenadines	PRGT	RCF	7/25/2011	15	60	4	16	1				1	2
St. Vincent and the Grenadines	PRGT/GRA	RCF/RFI	8/1/2014	50	50	15	16	2					2
Vanuatu	PRGT/GRA	RCF/RFI	6/5/2015	100	0	69	24	2					2
Total								11	1	0	2		14

Sources: Emergency Financing Documents, EM-DAT, WEO, WDI.

Note: Availability of remaining quota share subject to (a) Repeated Use policy (where members received RCF/RFI disbursements in within the preceding three years, an additional disbursement may only be approved in case of an urgent BOP need qualifying for the exogenous shock or natural disaster window, or an established track record of adequate macroeconomic policies over a period of at least six months immediately prior to the request; and (b) Subject to annual and cumulative access limits.

¹ Remaining quota specified as lower bound of annual access and cumulative access, available if a repeated use application were to be made.

Table AIII.4. SDS: Program Arrangements, 2010–2020

SDS	Type	Arrangement	Program Start Date	Program End Date	Caused by ND in Program Year ²	Motive for Program: Number of ND Events occurring in program range (T=0, t-1, t-2): Damages/GDP (In percent)				Motive for Argumentation – ND Events occurring in Program period: Damages/GDP (In percent)				Other ND Events 2010–2020, Outside Program period: Damages/GDP (In percent)				Total
						1–2	2–5	5–10	>10	1–2	2–5	5–10	>10	1–2	2–5	5–10	>10	
						Antigua and Barbuda	GRA	SBA	6/7/2010	6/6/2013	N	1						
Barbados	GRA	EFF	10/1/2018	9/30/2022	N	1							2					2
Comoros ¹	PRGT	ECF	9/20/2012	12/31/2013	N	1				1 (2014)			6					6
Djibouti	PRGT	ECF	9/17/2008	5/31/2012	N	1				1 (2010)			4					4
Grenada	PRGT	ECF	4/17/2006	4/16/2010	N													0
Grenada	PRGT	ECF	4/18/2010	4/17/2013	N													0
Grenada	PRGT	ECF	6/24/2014	6/25/2017	N								3					3
Maldives	GRA	SBA	12/4/2009	12/3/2011	N								4					4
São Tomé and Príncipe	PRGT	ECF	3/2/2009	3/1/2012	N													0
São Tomé and Príncipe	PRGT	ECF	7/20/2012	7/19/2015	N													0
São Tomé and Príncipe	PRGT	ECF	7/13/2015	7/12/2018	N													0
São Tomé and Príncipe	PRGT	ECF	10/2/2019	2/1/2023	N													0
Seychelles	GRA	EFF	12/23/2009	12/22/2013	N					1 (2013)			1					1
Seychelles	GRA	EFF	6/4/2014	6/3/2017	N					1 (2014)			1					1
Solomon Islands	PRGT	SCF	6/2/2010	12/1/2011	N	5												0
Solomon Islands	PRGT	SCF	12/6/2011	12/5/2012	N	1												0
Solomon Islands	PRGT	ECF	12/7/2012	12/6/2018	N	9												0
St. Kitts and Nevis	GRA	SBA	7/2/2011	7/26/2014	N											1		1
Suriname	GRA	SBA	5/27/2016	4/6/2017	N													0
Total						19	0	0	0	4	0	0	0	21	1	0	1	23

Sources: SDS program documents; EM-DAT; WEO.

¹ Comoros also had an emergency financing operation during the evaluation period, although this commenced in 2019, well after the end of the 2013 ECF arrangement. Prior to the 2019.

² A review of program documents identified whether a program was entered to finance the aftermath of an ND. Results are included as a Yes/No.

Table AIII.5. SDS with No Programme Arrangements or Emergency Financing Operations, 2010–2020

Country	ND Events 2010–2020: Damages/GDP (In percent)				Total
	0–2	2–5	5–10	>10	
Bahamas	5		1 (2016)	1 (2019)	7
Belize	5				5
Bhutan					0
Cabo Verde	2				2
Eswatini	3				3
Fiji	12			1 (2016)	13
Guyana	2				2
Kiribati	1				1
Marshall Islands	2				2
Mauritius	3				3
Micronesia	4				4
Montenegro	2				2
Nauru					
Palau	2				2
Timor-Leste	2				2
Tonga	6		1 (2014)		7
Trinidad & Tobago	2				2
Tuvalu	2				2
Total	55	0	2	2	59

Sources: EMDAT; WEO; Staff Reports; and author's calculations.

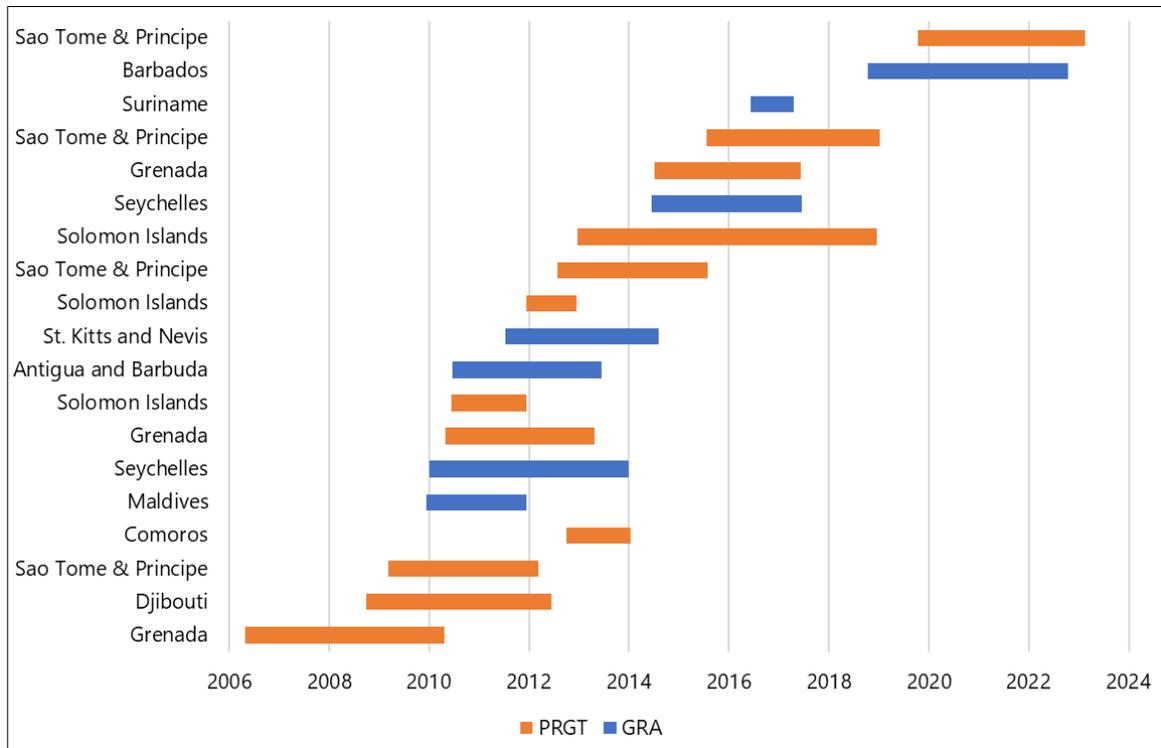
**Table AIII.6. IMF EF Financing for NDs Greater than 10 Percent of GDP,
1999–2020**

Country	Event Year	Damages/GDP (In percent)	Financing	Type of Lending
St. Kitts and Nevis	1999	11	N	-
Belize	2000	33	N	-
Belize	2001	29	N	-
Tonga	2001	28	N	-
Grenada	2003	200	Y	ENDA
Grenada	2004	148	Y	ENDA
Maldives	2004	38	Y	ENDA
Bahamas, The	2004	11	N	-
Guyana	2005	27	N	-
Dominica	2008	NA	Y	ENDA
Samoa	2009	21	Y	ESF
Belize	2009	NA	Y	ENDA
St. Kitts and Nevis	2009	NA	Y	ENDA
St. Lucia	2010	NA	Y	RCF and ENDA
St. Vincent and the Grenadines	2011	11	Y	RCF
Samoa	2012	30	Y	RCF
St. Vincent and the Grenadines	2013	15	Y	Blend
Dominica	2015	96	Y	RCF
Vanuatu	2015	60	Y	Blend
Fiji	2016	12	N	-
Dominica	2017	226	N	-
Antigua and Barbuda	2017	17	N	-
Bahamas, The	2019	25	N	-
Comoros	2019	13	Y	Blend

Sources: EMDAT; WEO; Staff Reports; and author's calculations.

ANNEX IV. SUPPLEMENTARY FIGURE

Figure AIV.1. Timeline of SDS Programs (2010–2020)



Sources: Finance Department; IEO calculations.

REFERENCES

- Abrams, Alisa, 2021, "The IMF Framework for Engagement with Small Developing States," IEO Background Paper No. BP/22-01/10 (Washington: International Monetary Fund).
- Acevedo, S., 2014, "Debt, Growth and Natural Disasters: A Caribbean Trilogy," IMF Working Paper No. 14/125 (Washington: International Monetary Fund).
- _____, 2016, "Gone with the Wind: Estimating Hurricane and Climate Change Costs in the Caribbean," Working Paper No. 16/199 (Washington: International Monetary Fund).
- Alano, E., and L. Minsoo, 2016, "Natural Disaster Shocks and Macroeconomic Growth in Asia: Evidence for Typhoons and Droughts," Economics Working Paper Series No. 503, Manila: Asian Development Bank.
- Asia Development Bank, 2013, "The Economics of Climate Change in the Pacific," Manila: Asia Development Bank.
- Benson C., and E. J. Clay, 2004, "Understanding the Economic and Financial Impacts of Natural Disasters," Disaster Risk Management Series No. 4 (Washington: The World Bank Group).
- Blankenspoor, B., and others, 2010, "Economics of Adaptation to Extreme Weather Events in Developing Countries," CGD Working Paper No. 199, Center for Global Development, Washington, DC.
- Briguglio, L., 2022, "Economic Growth of Small Developing States—A Literature Review," IEO Background Paper No. BP/22-01/12 (Washington: International Monetary Fund).
- Briguglio, L., and others, 2009, "Economic vulnerability and resilience: Concepts and measurements," *Oxford Development Studies*, 37(3), 229-247.
- Cabazon, E., and others, 2015, "Enhancing Macroeconomic Resilience to Natural Disasters and Climate Change in the Small States of the Pacific," IMF Working Paper No. 15/125 (Washington: International Monetary Fund).
- Cantelmo, A., and others, 2019a, "Macroeconomic Outcomes in Disaster-Prone Countries," IMF Working Paper No. 19/217 (Washington: International Monetary Fund).
- Cantelmo, A., and others, 2019b, "Policy Trade-Offs in Building Resilience to Natural Disasters: The Case of Saint Lucia," IMF Working Paper No. 19/54 (Washington: International Monetary Fund).
- Melina, G., and others, 2021, "Enhancing Resilience to Climate Change in the Maldives," IMF Working Paper No. 2021/096 (Washington: International Monetary Fund).

- Cashin, P., and P. Dyczewski, 2006, "Government Responses to Natural Disasters in the Caribbean," in *The Caribbean—From Vulnerability to Sustained Growth*, Sahay R., Robinson, D. O., and P. Cashin (editors), (Washington: International Monetary Fund).
- Clarke, D., 2016, "Disaster Risk Finance as a Tool for Development—A Summary of Findings from the Disaster Risk Finance Impact Analytics Project" (Washington: The World Bank Group).
- Dominica, 2020, "Disaster Resilience Strategy," Government of Grenada, unpublished.
- Diallo, Y., 2020, "Growth Impulse Responses to Natural Disasters and Climate Change: Evidence from Small States," Draft of the Independent Evaluation Office, unpublished (Washington: International Monetary Fund).
- Erce, A., 2021, "Market Debt Operations and Growth in IMF-Supported Programs," IEO Background Paper No. BP/21-01/06 for IEO Evaluation of *Growth and Adjustment in IMF-Supported Programs* (Washington: International Monetary Fund).
- Federated States of Micronesia, 2019, "Climate Change Policy Assessment," IMF Country Report No. 19/292 (Washington: International Monetary Fund).
- Freeman, P. K., M. Keen, and M. Mani, 2003, "Dealing with Increased Risk of Natural Disasters: Challenges and Options," IMF Working Paper No. 03/197 (Washington: International Monetary Fund).
- Grenada, 2020, "Disaster Resilience Strategy," Government of Grenada, unpublished.
- Haque, T., R. and others, 2016, "Planning Public Financial Management Reforms in Pacific Island Countries" in *Resilience and Growth in the Small States of the Pacific*, Khor, H., Kronenberg, R., & P. Tumbarello, (editors) (Washington: International Monetary Fund).
- Hochrainer, S., 2009, "Assessing the Macroeconomic Impacts of Natural Disasters – Are there Any?" World Bank Policy Research, Working Paper No. 4968 (Washington: The World Bank).
- Independent Evaluation Office of the IMF (IEO), 2018, *The IMF and Fragile States* (Washington: International Monetary Fund).
- _____, 2020a, "IMF Engagement in Small States," Issues Paper (Washington: International Monetary Fund).
- _____, 2020b, "IMF Collaboration with the World Bank on Macro-Structural Issues," Draft Issues Paper (Washington: International Monetary Fund).
- International Monetary Fund (IMF), 2008, "World Economic Outlook, Climate Change and the Global Economy," World Economic Outlook, October (Washington).

International Monetary Fund (IMF), 2020, "Regional Economic Outlook, Adapting to Climate Change in Sub-Saharan Africa," Regional Economic Outlook, April (Washington).

_____, 2011a, "Triennial Surveillance Review" (Washington).

_____, 2011b, "Modernizing the Framework for Fiscal Policy and Public Debt Sustainability Analysis" (Washington).

_____, 2011c, "The Fund's Financing Role: Reform Proposals on Liquidity and Emergency Assistance" (Washington).

_____, 2011d, "Report of the Task Force on the Fund's Technical Assistance Strategy" (Washington).

_____, 2012, "Modernizing the Legal Framework for Surveillance—An Integrated Surveillance Decision" (Washington).

_____, 2013a, "Macroeconomic Engagement in Small States" (Washington).

_____, 2013b, "The Fund's Capacity Development Strategy—Better Policies Through Stronger Institutions" (Washington).

_____, 2013c, "Staff Guidance Note for Public Debt Sustainability Analysis in Market-Access Countries" (Washington).

_____, 2014a, "Staff Guidance Note on the Fund's Engagement with Small Developing States" (Washington).

_____, 2014b, "Triennial Surveillance Review" (Washington).

_____, 2014c, "2014 Revised Operational Guidance to IMF Staff on the 2002 Conditionality Guidelines" (Washington).

_____, 2014d, "Review of Flexible Credit Line, the Precautionary and Liquidity Line, and the Rapid Financing Instrument" (Washington).

_____, 2014e, "IMF Policies and Practices on Capacity Development" (Washington).

_____, 2014f, "Review of the Financial Sector Assessment Program: Further Adaptation to the Post Crisis Era" (Washington).

_____, 2015a, "The Managing Director's Statement on the Role of the Fund in Addressing Climate Change" (Washington).

_____, 2015b, Guidance Note for Surveillance under Article IV Consultation (Washington).

- _____, 2016, "Small States' Resilience to Natural Disasters and Climate Change—Role for the IMF" (Washington).
- _____, 2017a, "The Effects of Weather Shocks on Economic Activity: How Can Low-Income Countries Cope?" *World Economic Outlook*, October (Washington).
- _____, 2017b, "Staff Guidance Note on the Fund's Engagement with Small Developing States" (Washington).
- _____, 2017c, "Large Natural Disasters—Enhancing the Financial Safety Net for Developing Countries" (Washington).
- _____, 2018a, "2018 Interim Surveillance Review" (Washington).
- _____, 2018b, "2018 Review of the Fund's Capacity Development Strategy—Overview Paper" (Washington).
- _____, 2018c, "Guidance Note on The Bank-Fund Debt Sustainability Framework for Low-Income Countries" (Washington).
- _____, 2019a, "Building Resilience in Developing Countries Vulnerable to Large Natural Disasters" (Washington).
- _____, 2019b, "Comprehensive Surveillance Review – Midpoint Note" (Washington).
- _____, 2019c, "2018 Review of Program Design and Conditionality" (Washington).
- _____, 2019d, "2018–19 Review of Facilities for Low-Income Countries—Reform Proposals; Review of the Financing of the Fund's Concessional Assistance and Debt Relief to Low-Income Member Countries" (Washington).
- _____, 2020a, "The Evolution of Public Debt Vulnerabilities in Lower Income Countries," Press Release No. 20/33, February 5 (Washington).
- _____, 2020b, "Comprehensive Surveillance Review – COVID-19 Update" (Washington).
- _____, 2020c, "Enhancing the Emergency Financing Toolkit—Responding to the Covid-19 Pandemic" (Washington).
- _____, 2020d, "Grenada—Request for Disbursement Under the Rapid Credit Facility" (Washington).
- _____, 2020e, "The Evolution of Public Debt Vulnerabilities in Lower Income Economies" (Washington).

- _____, 2021a, "Review of the Climate Change Policy Assessment Pilots—Update, Document presented by FAD and SPR to an Informal Board Meeting," May 26 (Washington).
- _____, 2021b, "Building Resilience to Natural Disasters: Pilot Strategies for Dominica and Grenada," IMF Country Report 21/182 (Washington).
- _____, 2021c, "Comprehensive Surveillance Review—Overview Paper," IMF Policy Paper (Washington).
- _____, 2021c, "Comprehensive Surveillance Review—Background Paper on Integrating Climate Change into Article IV Consultations," IMF Policy Paper (Washington).
- IPCC, 2021, "Climate Change 2021—The Physical Science Basis," IPCC AR6 WGI, New York.
- Jayaraman, T. K., 2006, "Macroeconomic Reform and Resilience Building in Small States," in L. Briguglio, G. Cordina, E.J. Kisanga (Eds.), *Building the economic resilience of small states* (pp. 33-58), Blata I-Bajda: Formatek Ltd.
- Joyette, A., and others, 2015, "Disaster Risk Insurance and Catastrophe Models in Risk-Prone Small Caribbean islands," *Disasters*, 9-3, 467-492, London, UK.
- Khonje, W.H., and T. Mitchell 2019, "Strengthening Disaster Resilience in Small States," London: Commonwealth Secretariat.
- Laframboise, N., and B. Loko, 2012, "Natural Disasters: Mitigating Impact, Managing Risks," IMF Working Paper No. 12/245 (Washington: International Monetary Fund).
- Lee D., H. Zhang, and Chau Nguyen, 2018, "The Economic Impact of Natural Disasters in Pacific Island Countries: Adaptation and Preparedness," IMF Working Paper No. 18/108 (Washington: International Monetary Fund).
- Loayza, N., and others, 2009, "Natural Disasters and Growth—Going Beyond the Averages." World Bank Policy Research Working Paper 4980, The (Washington: The World Bank).
- Lombardi, D., 2009, "The Role of the IMF in Low-Income Countries: An Institutional Approach," in Finance, Development, and the IMF, James M. Boughton and Domenico Lombardi (editors), Oxford University Press: Oxford, UK.
- Mallucci, E., 2020, "Natural Disasters, Climate Change, and Sovereign Risk", International Finance Discussion Papers No. 1291, Washington: Board of Governors of the Federal Reserve System.
- Marto, R., C. Papageorgiou, and V. Klyuev, 2017, "Building Resilience to Natural Disasters: An Application to Small Developing States," IMF Working Paper No. 17/223 (Washington: International Monetary Fund).

- _____, 2018, "Building Resilience to Natural Disasters: An Application to Small Developing States," *Journal of Development Economics*, 135, 574-586.
- Mycoo, M., 2018, "Beyond 1.5 °C: Vulnerabilities and Adaptation Strategies for Caribbean Small Island Developing States," *Regional Environmental Change*, 18, 2341–2353.
- Nishizawa, H., S. Roger, and Huan Zhang, 2019, Fiscal Buffers for Natural Disasters in Pacific Island Countries, IMF Working Paper 19/152, Washington: International Monetary Fund.
- Noy, I., 2007, "The Macroeconomic Consequences of Disasters," Working Paper 07-7, Department of Economics, University of Hawaii at Manoa.
- Nurse, L.A., and others, 2014, "Small islands," in "Climate Change 2014: Impacts, Adaptation, and Vulnerability," Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1613-1654.
- Raddatz, C., 2009, "The Wrath of God: Macroeconomic Costs of Natural Disasters," Policy Research Working Paper 5039, Washington: World Bank Group.
- Rasmussen, T. N., 2004, "Macroeconomic Implications of Natural Disasters in the Caribbean," IMF Working Paper 04/224 (Washington: International Monetary Fund).
- Rustomjee, C., 2016, "Vulnerability and Debt in Small States," CIGI Policy Brief, No. 83, Centre for International Governance Innovation: Waterloo, Ontario.
- Rustomjee, C., Y. Chen, and J. Li, 2022, "IMF Engagement with Small Developing States: Human Resource Issues," IEO Background Paper No. BP/22-01/11 (Washington: International Monetary Fund).
- Simpson, M., and others, 2010, "Quantification and Magnitude of Losses and Damages Resulting from the Impacts of Climate Change: Modeling the Transformational Impacts and Costs of Sea Level Rise in the Caribbean," United Nations Development Programme: Geneva.
- United Nations (UN), 2010, "Natural Hazards, Unnatural Disasters: The Economics of Effective Prevention," United Nations and The World Bank Group: Washington, DC.
- _____, 2021, "Nationally determined contributions under the Paris Agreement—Synthesis report by the Secretariat," FCCC/PA/CMA/2021/8, (United Nations: New York).

Van Aalst, 2006, "The Impacts of Climate Change on the Risk of Natural Disasters," *Disasters*, 30(1): 5–18, Blackwell Publishing: Oxford, UK:

Wei and Saad, 2020, "Building Resilience to Natural Disaster in Vulnerable States: Savings from Ex Ante Interventions," in *How Strong Infrastructure Governance Can End Waste in Public Investment*, G. Schwartz, M. Fouad, T.S. Hansen, and G. Verdier (editors) (Washington: International Monetary Fund).

World Bank, 2010, "The Costs to Developing Countries of Adapting to Climate Change: New Methods and Estimates—The Global Report of the Economics of Adaptation to Climate Change Study" (Washington).

_____, 2013, "Understanding Risk in an Evolving World—Emerging Best Practices in Natural Disaster Risk Assessment" (Washington).