3 SURVEILLANCE

ARTICLE IV CONSULTATIONS

Implementation

Leading up to and following the adoption of the Strategy, coverage of climate-related issues in Article IV consultations increased in response to members' demand. After moderate increases in 2019 and 2020, the percentage of Article IV reports that included material coverage of climate-related issues jumped in 2021 and 2022, reaching almost 80 percent, before declining slightly over the next two years (Figure 4).[1] According to country authorities and staff, this increase in coverage was largely due to demand from member countries, management, and the Executive Board. In addition, interviews with staff revealed that strong internal incentives and perceived pressure to cover climate-related issues boosted coverage, with most of it being passing mentions.[2] In 2025, however, material coverage of climate-related issues dropped to under 50 percent of Article IV reports, as staff incentives were affected by the de-prioritization of climate change in some capitals, the curtailed institutional signaling, and management's streamlining exercise.[3]

In line with the Strategy and the IMF's expertise, coverage of climate-related issues was mainly linked to fiscal policies among the traditional core areas. The Strategy, for example, lists fiscal management and public debt sustainability first among the major challenges triggered by climate change due in part to the economic costs associated with spillovers. The general guidance of the Strategy was further developed in the 2022 Guidance Note for Surveillance under Article IV Consultations (hereafter the 2022 Guidance Note) (IMF 2022d) (Box 2). Subsequently, the percentage of Article IV reports that included material coverage of climate-related issues linked to fiscal policies and structural policies increased significantly.[4]

This chapter draws on the evaluation background paper by Volz and Wojnilower (2026).

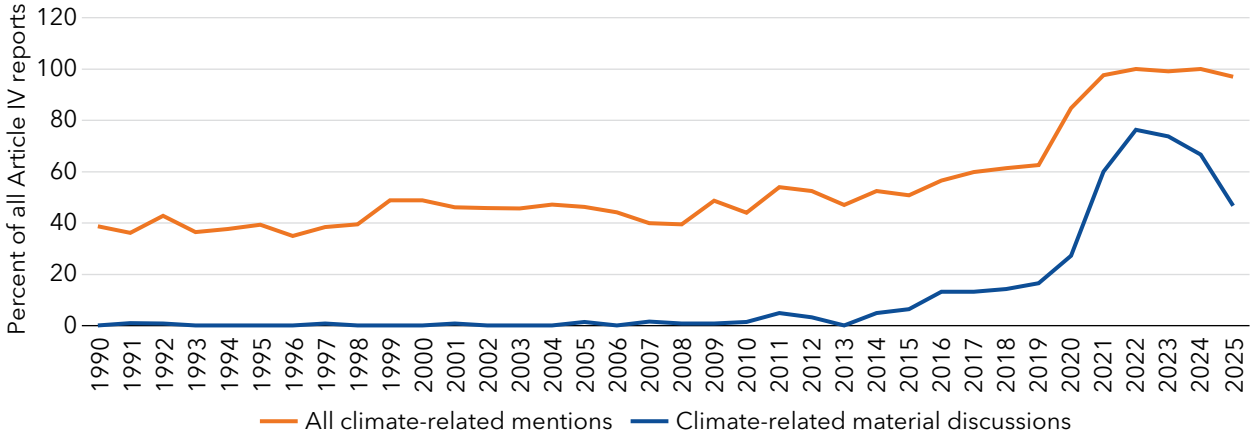
[1] "Material coverage" is defined as including at least five moderate or substantive climate-related discussions. Using large language models (LLMs), climate-related excerpts are classified into passing mentions; moderate discussions (i.e., excerpts that report on a country's targets, policies, and outcomes but do not contain any Fund staff analyses or recommendations); and substantive discussions (i.e., excerpts that contain Fund staff analyses or recommendations).

[2] Figure 4 also shows that nearly all Article IV staff reports since 2021 included climate-related excerpts, with passing mentions accounting for more than half of total climate-related excerpts during that period.

[3] In terms of Article IV consultations, the exercise called for narrower and less frequent coverage of macrocritical structural issues and policies including climate (IMF 2025d).

[4] The percentage of reports that covered climate-related issues linked to financial sector policies only rose slightly in recent years. Meanwhile, practically no reports covered climate-related issues linked to either exchange rate or monetary policies, which is largely attributable to limited availability of relevant methodologies and data in current academic literature.

FIGURE 4. COVERAGE OF CLIMATE-RELATED ISSUES IN ARTICLE IV REPORTS



Sources: Article IV reports; IEO staff calculations.

Note: The relatively high level of coverage prior to 2015 largely reflects discussions of natural disasters. Further details are provided in footnote 1 and the Online Statistical and Methodological Appendix.

These percentages peaked in 2024, at approximately 53 and 32 percent respectively, then declined substantially in 2025 to 28 and 19 percent, respectively. Seemingly reflecting this elevated status of climate-related issues within the Fund, nearly 80 percent of the reports in a desk review also included climate-related issues in their staff appraisal. Consistent with these findings, about 90 percent of country authorities and staff believe that climate-related issues have been integrated within the Fund's traditional core policy areas, at least to a slight extent.

The coverage of adaptation, domestic mitigation, and transition issues has been tailored across country groups. Adaptation issues were substantively and extensively covered in emerging market and middle-income economies (EMMIEs), as well as low-income countries (LICs), especially in those countries most vulnerable to climate change. Text analysis reveals that material coverage of adaptation issues was included in 46 percent of LICs' Article IV reports, while the corresponding figure was 33 percent for EMMIEs and 8 percent for advanced economies (AEs). Thus, adaptation issues have been covered in approximately 36 Article IV reports per year since 2021, exceeding the Augmentation steady-state target of 15 staff reports. Consistent with the 2022 Guidance Note, material coverage of domestic mitigation issues—i.e., policies to achieve domestic emissions targets—were included in about 40 percent of Article IV reports for AEs, in 25 percent for EMMIEs, and in 10 percent for LICs. Coverage of domestic mitigation was widespread in staff reports of the 20 largest emitters, for whom additional coverage of global efforts is strongly encouraged, although it was typically shallow.[5] Coverage of mitigation issues generally favored carbon pricing over other types of domestic mitigation policies (Box 3). Issues related to the global transition to a low-carbon economy received comparatively less coverage than adaptation or domestic mitigation, although they were more prominent among EMMIEs and in Western Hemisphere Department (WHD) countries, which seems consistent with assessments of macrocriticality.

[5] A desk review showed that at least once within the past three years, the Article IV reports for several of the largest emitters included a comparison of their emissions target(s) with peers and a discussion of their participation in global mitigation initiatives. Text analysis, however, revealed that less than 1 percent of Article IV reports since 2021 included material coverage of global mitigation efforts.

BOX 2. THE 2022 GUIDANCE NOTE: CLARIFYING MACROCRITICALITY

The 2022 Guidance Note, along with its subsequent internal updates, provides directions on the coverage of climate change and operationalizes other aspects that were left to the discretion of management and staff in the Strategy. Building on the Integrated Surveillance Decision (ISD), the 2014 Triennial Surveillance Review, and the 2015 Guidance Note for Surveillance under Article IV Consultations, it attempts to clarify the use of macrocriticality—e.g., what, when, and how—to determine coverage of adaptation, transition management, and global mitigation.

Macrocriticality assessment. Under the current frameworks, an assessment of macrocriticality is undertaken at the country level. The Strategy identified 60 climate vulnerable countries for which adaptation seemingly was macrocritical and stated that "transition management is a macrocritical policy challenge for almost every IMF member." Thus, the Fund has not taken the view that all climate-related issues are macrocritical for every member. Accordingly, the 2022 Guidance Note suggests that discussions of climate-related policy challenges in Article IV consultations include an "assessment of macrocriticality." The 2022 Guidance Note also states that "since NDCs and other domestic mitigation targets are fast-evolving targets, staff needs to reassess macrocriticality constantly." When a climate-related issue is deemed macrocritical for a given country, the 2022 Guidance Note clarifies that the provision of policy advice should be conditioned on the Fund having expertise on the issue. The 2022 Guidance Note, however, is not a checklist and does not establish formal requirements for Article IVs. Fund staff therefore "are expected to use judgment with respect to coverage in order to tailor surveillance to country circumstances" (IMF 2022d).

Adaptation. Coverage should begin with an assessment of macrocriticality, i.e., the extent to which spillovers from climate change may significantly affect the real, fiscal, external, or financial sectors. This could include a description of the risks and transmission channels and then proceed to a brief stocktaking of the authorities' policies to strengthen adaptation as well as an analysis of their (expected) impact and financing needs.

Transition management. Coverage once again should begin with an assessment of macrocriticality, which can be understood in two ways. In the first, primarily for countries that rely heavily on the production and export of fossil fuels, macrocriticality refers to the extent to which spillovers from other countries' policies to address climate change may significantly affect the real, fiscal, external, or financial sectors. Coverage should include a description of the risks from a permanent decline in fossil fuel demand and transmission channels through which those sectors would be impacted, and a brief stocktaking of the authorities' policies to diversify their economic and financial exposure as well as an analysis of their (expected) impact and financing needs. In the second, macrocriticality refers to the extent to which reaching a country's Nationally Determined Contributions (NDCs), i.e., domestic mitigation, will require policy changes that may significantly affect the real, fiscal, external, or financial sectors. Coverage therefore should include an assessment of the gap between the country's business-as-usual emissions path and its target(s), and a brief stocktaking of the authorities' policies to reduce emissions as well as an analysis of the country's (expected) impact and financing needs.

Global mitigation: While no country individually can make a sufficient contribution to global mitigation efforts to stop climate change, spillovers from insufficient mitigation efforts by large emitters may significantly affect the International Monetary System. While the 2021 Comprehensive Surveillance Review (CSR) determined that insufficient policies by individual large emitters could not have such an impact, coverage for the 20 largest emitters was strongly encouraged and expected, rather than required, independent of the macrocriticality and multilateral surveillance criterion (IMF 2021d).[1] For these countries, coverage should begin with the aspects outlined under achieving domestic emissions targets then include a comparison of their emissions target(s) with peers and a discussion of their participation in global mitigation initiatives.

Source: IMF (2022d).

[1] The 2021 CSR background paper on Integrating Climate Change into Article IV Consultations (IMF 2021c) provided a list of the 20 largest emitters at that time: Argentina, Australia, Brazil, Canada, China, the European Union (as well as France, Germany, Italy, and Poland on their own), India, Indonesia, Iran, Japan, Korea, Mexico, Russia, Saudi Arabia, South Africa, Thailand, Turkey, Ukraine, the United Kingdom, and the United States. Thus, there are 23 countries, along with the European Union, for which global mitigation coverage is expected currently. This list will be updated in the 2026 CSR and is expected to be updated every three to five years from then on. The IEO (2024) has noted the lack of clarity about what it means for coverage to be "strongly encouraged" and "expected," which opens questions regarding the expectation of coverage of global mitigation for the 20 largest emitters as well as its depth and frequency.

BOX 3. THE IMF'S ADVICE ON CARBON PRICING

Based on research since as early as 2008, the Fund's prevailing perspective is that climate change is an externality problem for which the standard economic prescription is charging a price for greenhouse gas (GHG) emissions equal to the present value of its social costs through a carbon tax, an emissions trading system (ETS), or a hybrid approach (IMF 2008a; 2008b). More specifically, the Fund has focused on increasing prices for CO_2 emissions because they represent the largest share of GHG emissions. Overall, the Fund's research suggests that carbon taxes on CO_2 emissions can be the most efficient and effective policy for mitigating climate change because they can (i) encourage efficient energy usage; (ii) incentivize investment in green energy; (iii) generate fiscal revenues; and (iv) administratively be least costly to implement.

While the international community largely agrees that carbon pricing can be a powerful instrument to reduce emissions, diverse stakeholders criticize the Fund's stance. The main critique seemingly is that the Fund has embedded carbon pricing in its surveillance and lending as a necessary component of each members' policy mix for domestic mitigation. Critics see this as problematic, in part, because carbon pricing can be regressive and its efficiency and effectiveness "depends heavily on how it is designed and how revenues are used" (Kentikelenis and Stubbs 2025). Moreover, they believe the Fund's excessive optimism regarding the actual implementation of carbon pricing schemes hinders a just transition by undermining support for sectoral policies and placing too much of the burden on low emitters. Other critics oppose carbon pricing on energy-security grounds or highlight the need for sustained and affordable long-term financing and technological transfer to allow investment in alternative energy resources.

The IMF, to its credit, has raised these issues in its research and reports. For example, Fund research shows that "country circumstances matter for the household incidence of carbon pricing" and the outcomes can range from moderately regressive to moderately progressive (IMF 2019). The Fund also has reiterated consistently that carbon pricing's efficiency and effectiveness depend on its implementation. More specifically, the Fund notes that using revenues to reduce broader taxes, fund public investments, or reduce fiscal deficits can produce efficiency gains that minimize the cost of reducing emissions. The Fund also recognizes that "if carbon pricing revenues are not used to increase economic efficiency [e.g., lump-sum dividends], pricing can be substantially less cost effective in a broad sense than regulatory combinations or similar policies" (IMF 2019). Moreover, the Fund has acknowledged that "the key priority for emerging market and developing economies is growth and development" and that "low-income developing countries should prioritize reducing energy intensity and adapting to climate change, given limited access to financing and modest contributions to global emissions" (IMF 2023a).

The differing perspectives of the IMF and its critics reflect different views regarding how to address "a fundamental trilemma for policymakers between achieving (1) climate goals, (2) fiscal sustainability, and (3) political feasibility" (IMF 2023a). From the Fund's perspective, fiscal interventions need to respect government budget constraints, and thus, given current fiscal space and the estimated cost of different domestic mitigation policies, members only can achieve their climate goals if carbon pricing is a prominent component of the policy mix. From the critics' perspective, achieving climate goals appears to take precedence; thus, given the potential of global resource mobilization and transfers, members should employ a policy mix that better reflects political constraints and addresses distributional concerns. Ultimately, these differences raise some important questions for the Fund, including (i) to what extent the Fund should adapt its policy advice based on the expected political feasibility of domestic mitigation measures and (ii) to what extent the Fund should incorporate in its assessments of individual members' fiscal space the potential for global resource mobilization and transfers.

Source: IEO.

Climate-related content generally has been adequate, although gaps exist. Coverage has focused largely on providing a stocktaking of countries' climate-related policies, analyzing their expected impact, offering strategies to improve their implementation, and giving advice on alternative policies, often supported by annexes and SIPs. However, there were gaps in the staff reports analyzed by the IEO:

- **The assessment of macrocriticality.** In terms of adaptation, domestic mitigation, and transition issues, nearly every report described at least one risk and one transmission channel, where relevant. Many reports, however, did not link those risks to their Risk Assessment Matrix (RAM) or assigned them a risk level inconsistent with their presentation in the main text (i.e., lower risk).[6] In terms of domestic mitigation, many reports implied, but did not quantify, a gap between the country's current emissions path and their emissions targets; possibly due to lack of clarity regarding those targets, insufficient expertise, and/or political economy considerations.[7] These cases raise questions about how the current framework's guidance, in terms of the analysis and justification of macrocriticality, is being met (Box 2). Both country authorities and staff concurred that macrocriticality was a useful, flexible principle that enabled staff to cover a range of structural issues and policies, although its operationalization was difficult, echoing previous IEO findings.[8] The Fund has developed a set of standardized climate change panel charts to highlight adaptation, domestic mitigation, and transition challenges, which could support more consistent assessments of macrocriticality in Article IV reports.[9]
- **The assessment of financing needs.** Most reports acknowledged that achieving adaptation, domestic mitigation, and transition goals will require creating fiscal space and/or relying on private and external financing. However, staff did not provide an explicit estimate (or range of estimates) of the overall financing needs or the expected sources for that financing, often treating the goals in an "aspirational" manner. Further, for most of these countries, staff mentioned that fiscal space was constrained and medium-term consolidation was warranted to rebuild fiscal buffers and stabilize or reduce debt levels. This implies that government budget constraints will inhibit current climate-related goals from being met, unless additional sources of financing are identified.[10] This raises questions about whether the financing needs associated with climate-related risks—including from underinvesting in climate adaptation and transition—have been sufficiently integrated in the Fund's analysis.[11]

[6] This discrepancy may stem from staff's limited scope to adjust the likelihood of risks drawn from the Global Risk Assessment Matrix (G-RAM) to country-specific contexts. This discrepancy also may stem from different time frames between the RAM, which focuses on a 5- to 10-year horizon, and the main text, which may require a longer time horizon for issues related to economic sustainability (see Volz and Wojnilower, 2026, Annex III).

[7] China's 2024 Article IV (IMF 2024c), on the contrary, provides a positive example of assessing the gap between a country's business-as-usual emissions path and its emissions target, using the Climate Policy Assessment Tool, and, in the DSA, estimating the financing needs associated with meeting China's net neutrality target in 2060. Papua New Guinea's 2022 Article IV also provides a good example of assessing the macrocriticality of the country's adaptation needs in an annex on climate change vulnerabilities drawing from external assessments (IMF 2022e).

[8] See IEO (2024) and Jannils and Wojnilower (2024).

[9] See Volz and Wojnilower (2026, Box 2) for further details. See also, for example, Segal and others (2026), which proposes a one-pager in all Article IV reports on climate-related considerations.

[10] See, for example, Kentikelenis and Stubbs (2025). These findings are consistent with the IEO evaluation of IMF Advice on Fiscal Policy (IEO 2025), which recommended articulating the trade-offs between competing long-term spending needs, fiscal sustainability, and their effects on growth, debt, and income distribution.

[11] Strengthening assessments of financing needs may entail large resource implications in terms of both new data and modeling, particularly for EMMIEs and LICs. Such calculations were very resource intensive when done in the past by WHD staff for two pilot cases, as part of the Disaster Resilience Strategies for Dominica and Grenada. Consequently, the Board decided to discontinue them. An approach that could reduce these resource implications would involve relying more on inputs from the World Bank, other international financial institutions (IFIs), and specialized organizations such as the International Energy Agency, especially when assessing financing needs related to adaptation and energy investment needs.

- **Macrocriticality and financing needs in debt sustainability analyses (DSAs).** Along with receiving less attention in the text, DSAs generally lacked sufficient or consistent incorporation of the macrocriticality of climate-related issues and their associated financing needs, either through the baseline scenario (2.7°C by 2100), stress tests, or via the two long-term climate change submodules in the Sovereign Risk and Debt Sustainability Framework (SRDSF) that display 30-year projections for the debt-to-GDP and gross financing needs-to-GDP.[12] More specifically, climate-related risks were not generally expected to affect the baseline scenario (i.e., the most likely evolution of key macroeconomic variables over the next 10 to 20 years) and adaptation costs were not generally expected to impact debt sustainability significantly in the long run. This raises questions about the realism of fiscal projections and the alignment of surveillance and analytical work with national and global climate objectives.[13]

Demand and Value Added

Member countries generally believed that the inclusion of climate-related issues in Article IV consultations added value and had traction, although there is room for better tailoring of the advice. Evidence from the IEO survey of country authorities was strong in this respect, as they stated that climate-related issues in Article IV consultations have enhanced their understanding of the issues (89 percent) and had traction—e.g., contributed to policy formulation—at least to a slight extent (82 percent). In interviews, however, country authorities were less sanguine, as many officials had doubts about the impact of the advice, arguing that it was too vague and/or insufficiently tailored to the country-specific context.[14] Thus, there seemingly remains room for improvement, which country officials noted could stem from increased expertise, deeper analysis, better understanding of a country's political economy, and more granular advice.

Looking ahead, most authorities and staff believe the IMF should continue to cover climate-related issues in Article IV consultations. Nevertheless, there are differences in the extent to which country authorities and staff think the Fund should cover adaptation, transition, and mitigation issues. Both groups believe the Fund should devote more attention to adaptation relative to mitigation issues and emphasized the importance of country specificity when prioritizing the content of bilateral surveillance, and the need to highlight spillovers in multilateral surveillance. However, staff expressed varying opinions in interviews on where the Fund could provide the most value added, with FAD staff in particular underlining the Fund's strength on issues related to achieving domestic emissions targets and global mitigation efforts. These responses underscore the relevance and timeliness of staff's ongoing efforts to develop internal expertise, particularly in functional departments, in an attempt to reflect the tangible and growing demand from members for deeper expertise on adaptation-related topics.

[12] This omission frequently was deliberate because robust empirical evidence to support existing estimates was lacking. Notably, both the Debt Sustainability Framework for Low-income Countries (LIC-DSF) and the SRDSF include a natural disaster stress test, and progress has been made in incorporating financing needs related to sea level rise (IMF 2022i). The LIC-DSF currently does not include long-term scenarios designed to capture the macroeconomic impacts of adaptation and transition risks. The ongoing LIC-DSF review is expected to address this shortcoming.

[13] The DSA in India's 2023 Article IV (IMF 2023c) provides a positive example of using the customized scenarios in both long-term climate change submodules to clearly highlight risks associated with financing the country's adaptation and mitigation needs.

[14] This difference may stem from the overrepresentation of countries with RSF arrangements in the IEO's interviews, where climate-related engagement took place predominantly in the context of the RSF rather than surveillance. Moreover, Fund staff typically emphasize broad macroeconomic guidance, while authorities may seek more detailed policy recommendations. For instance, suggestions such as implementing a carbon tax or integrating adaptation considerations into fiscal policy might be viewed as insufficiently specific by authorities expecting targeted guidance for particular sectors such as energy or agriculture.

FSAPS

Implementation

The depth of coverage of climate-related issues differed across FSAPs, reflecting risk-based prioritization and country-specific circumstances. Specifically, 19 of the 35 FSAPs published between January 2021 and August 2025 contained substantive analysis of climate-related issues. Among them, more than half included quantitative analyses of both physical and transition risks. For the others, the quantitative analysis focused only on physical or transition risks and, in a few cases, the substantive analysis was qualitative, centering on regulatory and supervisory responses.[15] Among the other 16 FSAPs, 3 included non-substantive analysis of climate-related issues, and the remaining ones either mentioned climate-related risks only in passing or not at all. New methodological approaches were tested in pilot FSAPs and, in 2022, a stocktaking exercise was conducted to support ongoing learning on climate modeling techniques, concepts, and challenges (Adrian and others 2022). Overall, climate-related issues have been covered in nearly two-thirds of FSAPs, which is broadly consistent with the target set in the Augmentation.

There were also inconsistencies between the coverage of climate in FSAPs and country-specific risks. Coverage is guided by a risk-based framework, consistent with the 2021 FSAP Review's recommendations (IMF 2021e), that considers various factors such as the systemic relevance and country-specific circumstances. Nevertheless, coverage can be constrained by data limitations, country authorities' priorities and capacity constraints, or the availability of relevant expertise. Accordingly, some FSAPs identified climate-related risks as material in the RAM and failed to include climate-related risks in stress tests. Other FSAPs did not conduct climate risk analysis even though the country's relative ranking in terms of vulnerability to physical and transition risks is high.[16] For instance, using a country's ND-GAIN Vulnerability Index score (Figure 5A) and share of fuel exports (Figure 5B) as proxies for their vulnerability to climate-related physical and transition risks, respectively,[17] the FSAPs for several countries with relatively high risks did not cover them. These cases raise questions about whether the Fund has integrated climate-related risks and its financial implications sufficiently in its formal analysis.

Demand and Value Added

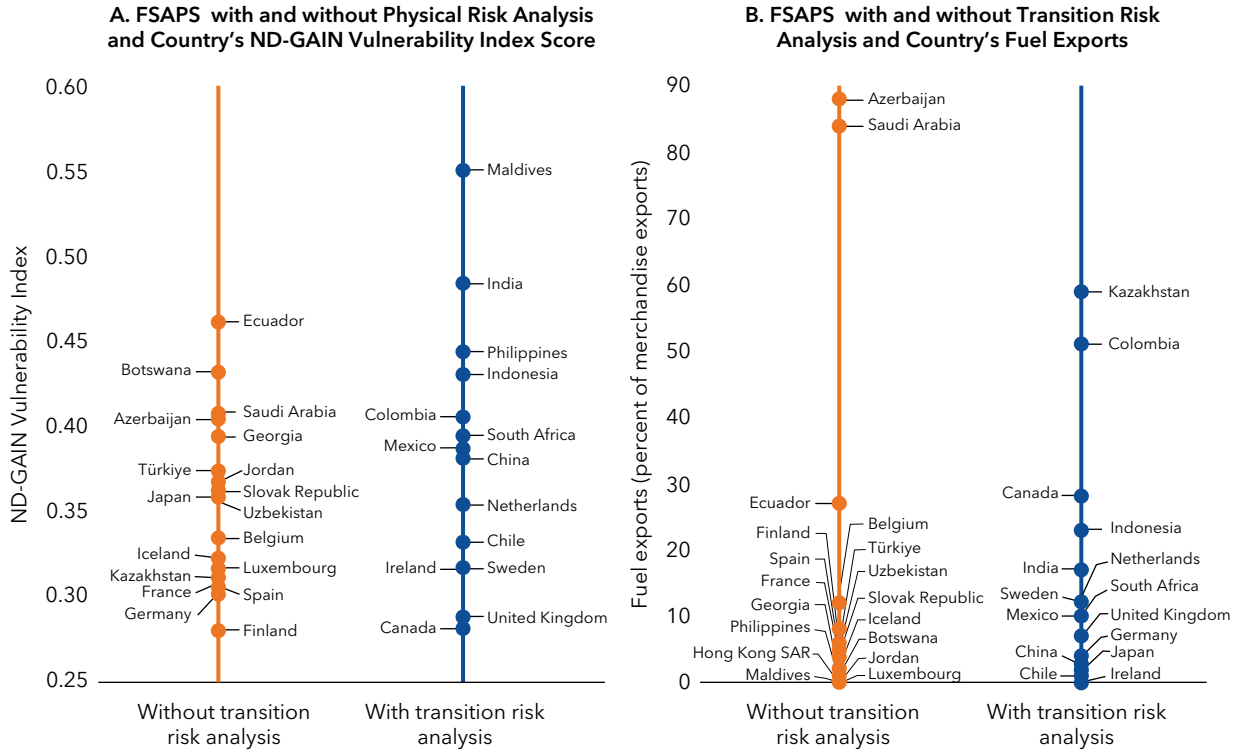
The inclusion of climate-related issues in FSAPs was demand driven, and member countries generally believed that it had added value and traction. According to both authorities and staff, the inclusion of climate-related issues in FSAPs was driven by members requests. Evidence from the IEO survey of country authorities showed that most authorities think coverage of climate-related issues in FSAPs has enhanced their understanding of the issues (80 percent) and had traction (77 percent), at least to a slight extent. In interviews, a few country officials expressed mixed views on the value added of climate-related analysis in FSAPs, noting that assessments, particularly stress tests, were useful and informative but limited in scope. Looking ahead, there is strong support from both authorities and staff for continuing coverage of climate-related issues in FSAPs.

[15] The main FSAP report, the Financial System Stability Assessment, was often backed up by technical notes providing details of the analysis.

[16] It is important to highlight that the scope of FSAPs is jointly determined with national authorities, who may or may not be interested in covering climate-related issues, even if risks are potentially large.

[17] The ND-GAIN Vulnerability Index is a widely used proxy of a country's vulnerability to climate hazards and their capacity to adapt to those changes. While this proxy does not translate directly into financial sector vulnerability, greater exposure and limited capacity to adapt likely increases financial sector risks.

FIGURE 5. COVERAGE OF PHYSICAL AND TRANSITION RISK ANALYSIS IN FSAPS



Sources: IEO staff calculations, with the most recent data available from ND-GAIN; World Bank.

Note: The ND-GAIN Vulnerability Index does not include the World Bank's Doing Business metrics. FSAP = Financial Sector Assessment Program. ND-GAIN = Notre Dame Global Adaptation Initiative.

FLAGSHIP REPORTS AND ANALYTICAL WORK

Implementation

Since 2008, the IMF has produced climate-related chapters in 14 flagship reports, mostly focused on fiscal and mitigation issues, and numerous climate notes. Those chapters were generally well-integrated with the Fund's traditional core policy areas, and they mainly focused on domestic and global mitigation, as set out in the CSR and the Strategy, with some coverage of transition management and adaptation finance. The target in the Augmentation of one to two chapters per year was met in 2021–23, but there were no chapters dedicated to climate-related issues in 2024 and 2025. Beyond the flagships, the Fund launched the Staff Climate Notes series in 2021. A total of 26 Staff Climate Notes were published between 2021 and 2024 to disseminate concise analysis on issues related to the impact of climate change on macroeconomic and financial stability. In May 2025, the Fund decided to eliminate sub-branded notes series, including the Staff Climate Notes, whose publication had been interrupted early in the year.[18] Some staff expressed concern with the decision and questioned whether similar notes would be published in the context of streamlined operations.

The IMF has developed multiple high-quality analytical tools and models to assess the macroeconomic effects of climate change and related policies, while some gaps remain. These tools and models, which often were employed initially in flagship reports and other papers, have been used to support all the Fund's activities. After an initial period of exploration and proliferation of models, the Fund has

[18] This initiative preceded management's streamlining process, which also called for a reduction in the length and frequency of Fund publications including flagship reports, REOs, and Notes series (IMF 2025d). It is unclear to what extent this process will affect the quality and quantity of coverage of climate-related policies and issues in multilateral surveillance, policy papers, and analytical notes.

entered a phase of streamlining and prioritization. The strongest tools and models are largely an extension of the Fund's foundational tools and models, leading to high quality climate-related analysis in the Fund's traditional core areas of expertise. Nevertheless, some gaps remain related to the feedback effects of climate onto the economy, country-level macroeconomic impacts, standardized metrics of climate-related financial risks, and tools and models to assess adaptation policies (Box 4).

BOX 4. ANALYTICAL TOOLS AND MODELS

The IMF is streamlining its analytical tools and models to assess the macroeconomic effects of climate change and related policies following an initial proliferation.[1] In line with the approach taken by other international institutions, the Fund has developed and employed numerous tools and models to assess risks, impacts, and policy responses, including the Climate Policy Assessment Tool (CPAT), the IMF-ENV model, the Debt-Investment-Growth and Natural Disasters (DIGNAD) model, the Global Macroeconomic Model for the Energy Transition (GMMET), the Natural Disasters Debt Dynamics Tool (ND_DDT), and the Quantitative Climate Risk Assessment Fiscal Tool (Q-CRAFT). The Fund's initial approach was to explore different models to better understand the challenges posed by the profound, structural economic transformation implied by climate change. Following this initial stage, the Fund is currently streamlining its tools and models to enhance their quality and consistency as well as improve knowledge sharing.

The IMF has maintained the focus on its areas of expertise, particularly the macroeconomic effects of natural disasters and mitigation policies. The tools and models have been designed to improve surveillance, lending, and capacity development (CD) activities, especially in the fiscal and financial realms, by enhancing the understanding of the impact of climate change and related policies on key macro variables such as output, public revenue, public spending, and the debt-to-GDP ratio. Much attention has been paid to modeling the effects of natural disasters (including extreme weather events) and mitigation policies with a focus on fiscal instruments—including the use of carbon pricing as a necessary component of the policy mix in line with the Fund's expertise and preference for this policy. The Fund also has developed tools and models to analyze climate-related financial sector risks, as well as climate stress tests in FSAPs. Less attention has been paid to developing tools and models to assess adaptation policies and the impact of climate change on exchange rates and inflation, despite evidence that climate change can have significant macroeconomic impacts in these areas.

The analytical tools and models are of high quality, and the IMF has been transparent on their strengths and weaknesses. According to experts, Fund tools and models represent state of the art macro modeling and analysis. Many of them are mainstream general equilibrium models that are comparable to those of, and often developed in cooperation with, other international institutions, ministries of finance, central banks, or academics. Detailed documentation or user guides have been published for all major tools and models, and some of the models have been shared with member countries. More broadly, recognizing the need for transparency and the high level of public scrutiny of the Fund's work on climate-related issues, staff have presented analytical tools in academic and international forums, although not all models are publicly available to external researchers. Authorities held positive perceptions regarding the value added of these tools, and internal views also were positive, highlighting the unique expertise developed in climate modeling.

Nevertheless, there is room for improvement related to the feedback effects of climate onto the economy, country-level macroeconomic impacts, standardized metrics of climate-related financial risks, and tools and models to assess adaptation policies:

- **Feedback effects of climate onto the economy.** The Fund's tools and models do not yet sufficiently analyze the structural change of economies in response to climate change nor the second-round effects of climate on the economy. The recently developed ENV-FIBA model (Gross and others 2025), which was built to analyze climate impacts on the financial sector, can incorporate feedback loops in the framework if they are analytically determined and empirically estimated. The Fund could benefit from building on these efforts to incorporate such feedback loops into other analytical tools and models.
- **Country-level analysis.** Mitra and others (2025) highlight three important gaps related to country-level macroeconomic impact analysis, namely: (i) modeling certain impacts, such as the growth effects of changes to the frequency and intensity of extreme weather events; (ii) the difficulties of operationalizing tools and models without

BOX 4 (CONTINUED)

extensive expert support; and (iii) a deeper incorporation of climate-related considerations beyond carbon pricing or subsidy reforms.

- **Standardized metrics of climate-related financial risks.** The IMF's Monetary and Capital Markets Department (MCM) has developed tools and models to assess and manage climate-related financial risks, helped integrate climate risks into banking regulation and supervision, and supported the development of climate information architecture (notably, climate-related disclosures) as well as the development and issuance of sustainable debt instruments. However, the determination of climate-related financial risks across countries remains relatively ad hoc and inconsistent. The Fund could enhance the value added of its work in this area by developing standardized metrics of climate-related financial risks.
- **Tools and models to assess adaptation policies.** The Fund historically has had stronger expertise on domestic and global mitigation topics (e.g., fuel subsidy reform and carbon pricing) and, accordingly, developed a more comprehensive suite of tools and models in this area first. Over the past several years, however, the Fund has significantly strengthened and expanded its adaptation expertise in macrocritical areas. The Fund could enhance the traction of its analysis and advice on adaptation policies by using this expertise to further develop the suite of corresponding tools and models and enhance its cooperation with other international organizations where its expertise still is lacking.

Source: IEO.

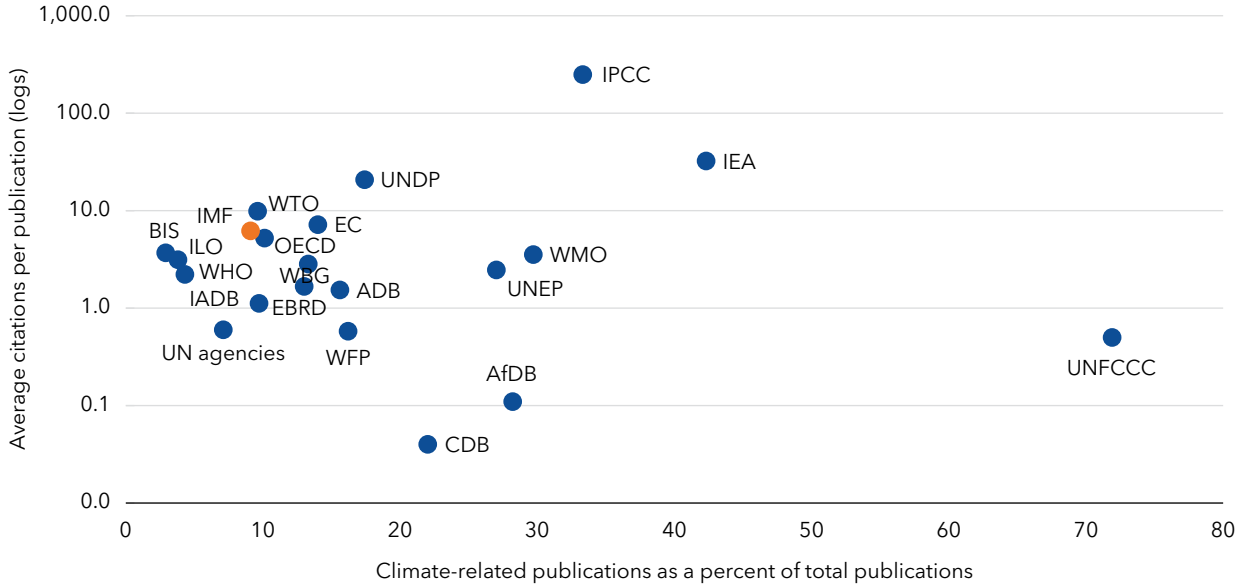
[1] A recent IMF working paper (Mitra and others 2025) provides an overview and takes stock of the tools and models applied by the Fund assessing the impact of physical climate risks as well as adaptation, transition, and mitigation policies. This box focuses on a key subset of the Fund's tools and models.

Demand and Value Added

The climate-related analyses in flagship reports have provided value added in various ways. First, in the view of many authorities, these chapters have had a lasting impact, raising awareness about the macrocriticality of climate change among policymakers, ministries of finance, and central banks, reinforcing the message that financial and monetary authorities have a role to play in addressing the macroeconomic implications of climate change. For these officials, the Fund's studies of the severe economic policy challenges created by climate change have been key to catalyzing action, complementing the analyses conducted at the bilateral level. Second, most surveyed authorities thought that coverage of climate-related issues in flagships, which they considered of good quality and used in internal documents, enhanced their understanding of the issues (91 percent) and had traction by contributing to policy formulation (81 percent), at least to a slight extent. Third, authorities and staff agreed that these chapters have triggered fruitful engagement both among domestic institutions and between authorities and the Fund. Looking forward, there is high demand from the membership for the Fund to continue to devote space in flagship reports to climate-related issues in adaptation, mitigation, and transition, which contrasts with the absence of dedicated chapters in 2024 and 2025.

The value added of the IMF's climate-related analytical work is also reflected in the relatively high citation of its climate-related publications (Figure 6). While other institutions and leading research centers conduct similar analyses, the Fund's work carries particular influence among member country authorities due to its credibility, technical authority, and close engagement with ministries of finance and central banks. The Fund's cross-country estimates of fossil fuel subsidies and analyses of green investment are among its most widely referenced climate-related outputs and have become key inputs to global policy debates on subsidy reform and the reallocation of public resources toward sustainable and equitable outcomes. Altogether, the Fund's research has positioned the institution as a credible and influential voice in global climate policy debates among scholars, policymakers, and other international organizations.

FIGURE 6. POLICY CITATIONS PER CLIMATE-RELATED PUBLICATION FOR SELECTED ORGANIZATIONS, 2021–25



Sources: Overton; Canseco, Gentle, and Pérez Verdía (2026).

Note: The average citations per publication are presented in logs to capture relative variation and to facilitate comparison across a wide dispersion of citation counts. ADB = Asian Development Bank; AfDB = African Development Bank; BIS = Bank for International Settlements; CDB = Caribbean Development Bank; EBRD = European Bank for Reconstruction and Development; EC = European Community; IEA = International Energy Agency; ILO = International Labour Organization; OECD = Organisation for Economic Co-operation and Development; UNEP = United Nations Environment Program; WBG = World Bank Group; WFP = World Food Program; WHO = World Health Organization; WMO = World Meteorological Organization; WTO = World Trade Organization.