



# Exclusion Risks in Climate-Related Financial Regulation: An Analytical Framework

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## Acronyms

AFI	Alliance for Financial Inclusion
AML/CFT	Anti-Money Laundering / Countering the Financing of Terrorism
ASEAN	Association of Southeast Asian Nations
BCBS	Basel Committee on Banking Supervision
BBM	Borrower-based Measures
BIS	Bank for International Settlements
BPF	Brown Penalizing Factor
BTAR	Banking Book Taxonomy Alignment Ratio
CAR	Cadastro Ambiental Rural (Rural Environmental Registry)
CDRFI	Climate Disaster Risk Finance and Insurance
CMSMEs	Cottage, Micro, Small and Medium Enterprises
CRFR	Climate-related Financial Risk
CSR	Corporate Social Responsibility
CSRD	Corporate Sustainable Reporting Directive
EBA	European Banking Authority
EMDEs	Emerging Markets and Developing Economies
ERM	Environmental Risk Management
ESDD	Environmental and Social Due Diligence
ESG	Environmental, Social and Governance
ESRM	Environmental and Social Risk Management
EU	European Union
FSAP	Financial Sector Assessment Program
FSA	Financial Sector Authority
FSI	Financial Stability Institute
G20	Group of Twenty
G20-SFWG	G20 Sustainable Finance Working Group
GAR	Green Asset Ratio
GHG	Greenhouse Gases
GRI	Global Reporting Initiative
GSF	Green Supporting Factor
IAIS	International Association of Insurance Supervisors
ICAAP	Internal Capital Adequacy Assessment Process
IFRS	International Financial Reporting Standards
ILAAP	Internal Liquidity Adequacy Assessment Process
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
ISSB	International Sustainability Standards Board
MFI	Microfinance Institution
MSME	Micro, Small and Medium Enterprise

ND-GAIN	Notre Dame Global Adaptation Initiative
NGFS	Network (of Central Banks and Supervisors) for Greening the Financial System
OECD	Organization for Economic Cooperation and Development
RWA	Risk-weighted Assets
SBFN	Sustainable Banking and Finance Network
SICOR	Sistema de Operações do Crédito Rural e do Proagro (Rural Credit and Proagro System)
SME	Small and Medium Enterprise
SSB	Standard Setting Body
SyRB	Systemic Risk Buffer
TCFD	Task Force on Climate-related Financial Disclosures
TRO	Targeted Refinancing Operations
TVC	Taxonomía Verde de Colombia (Colombia's Green Taxonomy)
UNEP FI	United Nations Environment Program Finance Initiative
UNFCCC	United Nations Framework Convention on Climate Change
WBG	World Bank Group

## Key definitions

Climate adaptation	The process of adjustment to actual or expected climate change and its effects in order to moderate harm or exploit beneficial opportunities (IPCC 2022).
Climate change physical risk	Economic costs and financial losses resulting from the increasing severity and frequency of: i) extreme climate change-related weather events or extreme weather events such as heatwaves, landslides, floods, wildfires and storms; ii) longer-term gradual shifts of the climate such as changes in precipitation, extreme weather variability, ocean acidification, and rising sea levels and average temperatures (i.e. chronic physical risks or chronic risks); and iii) indirect effects of climate change such as loss of ecosystem services (BCBS 2021).
Climate change mitigation	An intervention to reduce emissions or enhance the sinks of greenhouse gases (IPCC 2022). Climate change mitigation involves actions to reduce or prevent greenhouse gas emissions from human activities. Mitigation efforts include transitioning to renewable energy sources, enhancing energy efficiency, adopting regenerative agricultural practices and protecting and restoring forests and critical ecosystems (UNDP 2024).
Climate change transition risk	The risks related to the process of adjustment towards a low-carbon economy (BCBS 2021).
Climate finance	Funding – from local, national or transnational funds drawn from public, private, and alternative sources of financing – that aims to finance activities that mitigate climate change effects and promote adaptation measures to address climate change. It is focused on direct funding to projects and initiatives, excluding financial market transactions like bank lending to firms or investments in private and public stocks, to maintain the fundamental rule of preventing double counting (UNFCCC, 2024).
Climate-related financial risks (CRFR)	Risks that arise from the impacts of climate change or efforts to mitigate them. Climate-related physical and transition risk drivers can translate into traditional financial risk categories like credit, market, operational, liquidity, strategic and reputational risks. CRFR can materialize over varying time horizons, often exceeding traditional capital planning periods (BCBS 2024).
Climate-related financial regulation (or “climate-related regulation”)	<p>In this paper, “climate-related financial regulation”, or its shorter version “climate-related regulation” includes regulatory and legal instruments covering one or more of the following:</p> <ol style="list-style-type: none"><li>1. Requirements to address risks (climate and other environmental risks);</li><li>2. Disclosure requirements; and</li><li>3. Green or sustainable finance taxonomies and product standards.</li></ol> <p><a href="#">Table 1</a> provides the full taxonomy of climate-related regulation analyzed in this paper.</p>

Environmental, social and governance (ESG) risk	Environmental risks include the physical impact of global warming which may make some geographies higher risk, and transition risks such as public policy, technological advancements and market sentiment, may lead to some activities being phased out. Social risks include the negative financial impacts linked to factors such as inequality, health or labor relations, whereas governance risks include the negative financial impacts linked to factors such as executive leadership or bribery and corruption (EBA 2021).
Green finance	The term green finance has been variously used to capture financial services that support investments in climate change mitigation, climate adaptation, nature-based assets, ecological sustainability, and other environmental objectives. While important, the term can become problematic to use due to the lack of a generally agreed definition of its scope, let alone the nuances of its application in practice. We use it here to encompass all the aforementioned elements, which is possible given the high-level nature of the discussion. Where financial sector stakeholders opt to use this or similar terms, however, it will typically be important to define its scope and application with the greatest clarity, including by introducing subsidiary terminology that distinguishes between important subcategories (Knaack and Zetterli 2023).
Greenwashing	The European Supervisory Authorities (ESAs) define greenwashing as a practice where sustainability-related statements, declarations, actions, or communications do not clearly and fairly reflect the underlying sustainability profile of an entity, a financial product, or financial services, either under or outside the remit of the EU regulatory framework. This practice – which can be intentional or unintentional – may be misleading to consumers, investors, or other market participants (EBA 2023).
Just transition	A set of principles, processes, and practices that aim to ensure that no people, workers, places, sectors, countries or regions are left behind in the transition from a high-carbon to a low-carbon economy. It stresses the need for targeted and proactive measures from governments, agencies and authorities to ensure that any negative social, environmental, or economic impacts of economy-wide transitions are minimized, while benefits are maximized for those disproportionately affected (IPCC 2022).
Nature-related financial risks	Risks of negative effects on economies, individual financial institutions and financial system that result from: i) the degradation of nature, including its biodiversity, and the loss of ecosystem services that flow from it (i.e. physical risks); or ii) transition risk, i.e. the misalignment of economic actors with actions aimed at protecting, restoring, and/or reducing negative impacts on nature. Nature-related financial risks incorporate the full spectrum of climate and environmental risks (NGFS 2024).
Sustainable finance	The process of taking due account of ESG considerations when making investment decisions in the financial sector, leading to increased longer-term investments into sustainable economic activities and projects (European Commission). It has become a powerful movement led by regulators, institutional investors and asset managers globally (World Bank 2021).

# Executive Summary

**F**IGHTING CLIMATE CHANGE, PRESERVING financial stability, and ensuring financial inclusion are deeply interconnected goals (Knaack and Zetterli, 2023). Inclusive finance is vital for achieving climate goals, as it enables vulnerable groups—such as smallholder farmers, low-income segments, and micro, small, and medium enterprises (MSMEs)—to adapt to climate risks, mitigate negative impacts of climate change, and participate in the green transition. At the same time, a stable, safe, and sound financial system is a key precondition for inclusive finance to support the global climate agenda. However, climate risks increasingly threaten financial stability by jeopardizing economic growth and the sector’s ability to remain resilient and serve the economy (Feyen et al 2020a). Financial instability could amplify financial exclusion, and this would further hinder the ability of marginalized groups to contribute to the fight against climate change, accelerating its negative impact over the economy and reinforcing financial instability. This potentially vicious cycle could be acute in emerging markets and developing economies (EMDEs), which face higher climate risks and larger underserved populations.

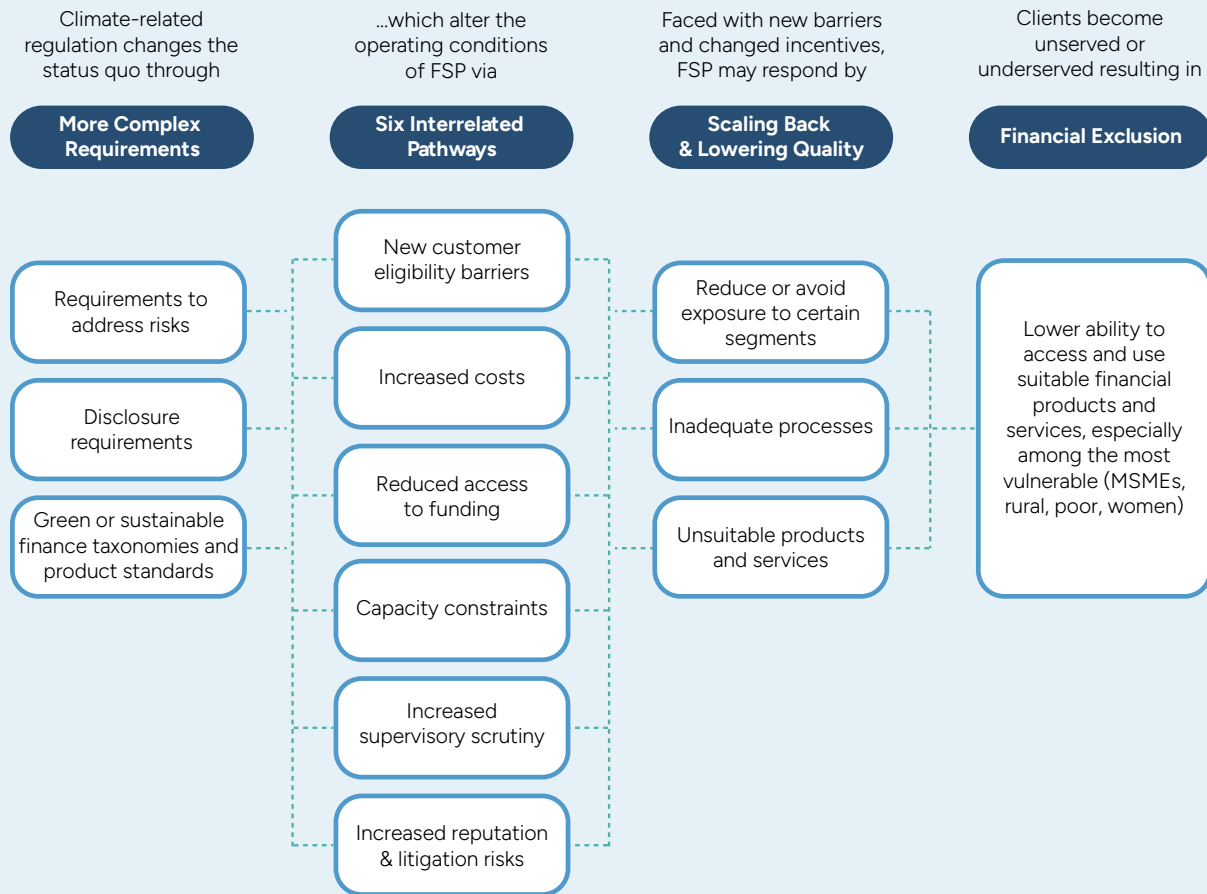
In this setting, climate-related financial regulation arises as crucial to preserve financial stability while supporting climate finance. An increasing number of financial sector authorities (FSAs) are adopting climate-related financial regulation, but many struggle to understand or fail to appreciate the significant implications for financial inclusion. Most of these regulations introduced by EMDEs follow international guidance and the steps taken by advanced economies. For the purposes of this paper the following are considered climate-related financial

regulation: i) requirements to address climate and other environmental risks; ii) disclosure requirements; and iii) green or sustainable finance taxonomies and product standards. These regulations seek to mitigate risks posed by climate change on the financial sector; increase transparency and support green or sustainable finance. However, such regulations could introduce financial exclusion risks. For instance, faced with increased climate-related regulatory requirements, financial service providers (FSPs) could find it uneconomical to serve low-income groups, particularly those more exposed to climate-related risks.

This paper provides an analytical framework for FSAs in EMDEs to examine how climate-related financial regulation could disproportionately affect access to credit among vulnerable groups in EMDEs, with the aim of identifying measures to not only minimize the exclusionary risks of regulation, but also fuel the virtuous cycle between stability, climate resilience and financial inclusion. The focus on credit in this paper is due to its prominence as the main form of financing available to these groups in EMDEs, and because a good portion of the regulatory action in EMDEs has been directed toward lending activities.

The framework (summarized in the Figure 1) comprises six impact pathways through which climate-related financial regulation can reduce the ability or the incentives for FSPs to serve these segments. First, regulation can impose additional credit underwriting requirements and limit or discourage lending to certain activities and sectors, introducing new customer eligibility barriers. Second, regulation can lead to increased costs for FSPs and customers. Third, they

FIGURE 1. Pathways from climate-related regulation to financial exclusion



Source: Authors

could lead to reduced access to funds for FSPs to meet the climate adaptation and resilience needs of vulnerable groups. Fourth, FSPs may experience increased capacity constraints, leading to conservative practices and exclusionary risk management approaches. Fifth, uncertainty about the scope and outcome of increased supervisory scrutiny in the face of new, complex regulation may prompt FSPs to engage in over-compliance, favoring larger, less risky borrowers. Finally, increased reputational and litigation risks stemming from non-compliance or grey areas in the regulation may lead FSPs to adopt risk-avoidance behaviors, disproportionately impacting highly vulnerable segments.

These pathways are not independent transmission channels, but often interrelated and mutually reinforcing. For instance, new regulatory requirements or guidance on client eligibility for lending operations – some of which could lead to exclusion – could increase costs for FSPs, which could lead them to impose additional eligibility criteria on new borrowers, to ensure profitability. The purpose of presenting the pathways separately is to highlight and illustrate the various ways climate-related financial regulation could contribute to financial exclusion, because exclusion risks may be difficult for FSAs to detect and there is limited empirical evidence to date. Our intent is to help FSAs identify exclusion risks so they can design regulatory, supervisory, and non-regulatory measures that could counter exclusion risks. Finally, these

pathways consider potential exclusion risks from all types of finance, although inclusive climate finance may be particularly impacted.

FSA in EMDEs must aim to preserve financial stability and promote climate finance while minimizing financial exclusion risks. Adopting a proportional approach (risk and principles-based, consultative and gradual), fully consistent with international standards and guidance by standard setting bodies (SSBs),<sup>1</sup> will help FSAs meet the needs of vulnerable groups while containing additional costs imposed on FSPs. They can start by identifying the challenges FSPs face when serving the most vulnerable and consider specific measures to accommodate these segments. Relatedly, green or sustainable finance taxonomies need to be designed with due account to each country's economic, social and regulatory context. The process should be guided by clear supervisory expectations and supervisors and FSPs should be educated and reminded about the risks of exclusionary overcompliance.

The risk of financial exclusion from climate-related financial regulation is particularly acute in those EMDEs with institutional weaknesses. For example, weak enforcement of environmental laws, high levels of MSME informality and capacity limitations such as poor climate risk data, limited expertise at FSPs and MSMEs, which not only amplify the exclusionary potential of regulation but also limit the effectiveness of tools designed to promote inclusive climate finance. Addressing these challenges requires a holistic approach that maximizes synergies across public and private sector actions and different policy goals including financial sector development, financial inclusion and the climate agenda.

EMDEs must ensure that their climate agendas are tailored to their unique contexts and needs, implementing a diverse set of policies and interventions in addition to regulatory reforms. These include market support mechanisms, tools to promote

inclusive climate finance, and robust responses to climate shocks. Additionally, SSBs and international organizations should more explicitly integrate financial inclusion into their work on climate-related financial regulation, including assessing uneven regulatory impacts in EMDEs. They can play a critical role in developing methodologies to harmonize green or sustainable taxonomies, help FSAs and FSPs tailor their transition plans, and provide specific regulatory and supervisory guidance for FSAs as needed.

Finally, further research is needed to: i) enhance empirical evidence of the impact of climate-related financial regulation on credit provision and expand it to cover the provision of other financial services such as insurance; ii) explore effective approaches for the application of the principle of proportionality in climate-related financial regulation, for example through specific regulatory adjustments such as thresholds or exemptions and related supervisory practices; iii) analyze consumer protection risks arising from the growing offer of green/sustainable financial products; iv) evaluate the effectiveness of existing tools designed to promote inclusive climate finance and explore alternative strategies that could better serve vulnerable populations; and v) explore technology-enabled solutions for FSPs to implement climate-related financial regulation while promoting resilience and adaptation via inclusive financial products and services.

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<sup>1</sup> For instance, BCBS (2022b).

# Introduction

**T**HE CLIMATE AGENDA IS DEEPLY LINKED to financial stability and inclusion: addressing climate risks is essential to protect stability and inclusion, both of which are critical to achieving climate goals. Climate risks can worsen financial exclusion, making vulnerable groups a less appealing client base. For example, 3.3 billion people live in regions classified by the Intergovernmental Panel on Climate Change (IPCC) as highly vulnerable to climate change (Zetterli et al 2024) and women could be particularly affected (Notta and Zetterli 2023). Once financially excluded, it becomes harder for these groups to adapt to climate change, increase their resilience to the impacts of climate change or to engage in a just transition, further increasing their perceived risk to FSPs. At the same time, without addressing climate risks, financial stability is also deeply threatened, hence the need to embed these risks in the financial regulatory framework. Continued monitoring of both physical and transition climate-related financial risks (CRFR) through financial supervision is crucial to help the financial sector support and enable the necessary adaptation, resilience, and transition efforts.

Knaack and Zetterli's (2023) framework highlights linkages between inclusive finance and the climate agenda, to show that climate-related financial sector regulations could potentially result in financial retrenchment while this paper explores how they could impact the ability or incentives of financial service providers (FSPs) to give credit to high-risk, less profitable customers. Inclusive finance is essential for achieving climate goals (Zetterli et al 2024), because it serves as a tool for economic empowerment and enables communities to adapt and participate in a

just transition, increasing their overall resilience. In this manner, inclusive finance is positively linked to financial stability, which is a pre-condition to effectively support the global push for climate finance. Inclusive climate regulation and policy can therefore drive a virtuous cycle of growing inclusion, resilience, and stability (Knaack and Zetterli 2023).

Following the 2015 Paris Agreement, which committed countries to a low-carbon future, there has been a surge in policy and corporate initiatives to boost climate finance. This global reorientation of financial flows requires a strong financial sector and incentives for FSPs. In response, the Group of Twenty (G20) set up the Green Finance Study Group in 2016, later evolving into the Sustainable Finance Working Group (G20 SFWG) in 2021, to align the global financial system with climate objectives (G20 SFWG 2021).

Financial sector authorities (FSAs) are developing climate-related regulations to maintain financial stability while simultaneously supporting the growth of climate finance. The G-20 SFWG's sustainable finance roadmap emphasizes the need for a stable and resilient financial sector, calling for effective management of CRFR. This led to global initiatives like the Financial Stability Board (FSB)'s roadmap to address CRFR (FSB, 2021a), and the creation of platforms such as the Network for Greening the Financial System (NGFS) that guides regulatory reforms across the globe. Also, other international organizations such as the Organization for Economic Cooperation and Development (OECD), the International Monetary Fund (IMF), and the World Bank Group (WBG) have all stepped up work in this area

## BOX 1. Definition of climate-related financial regulation in this paper

CRFR, as defined by the Basel Committee on Banking Supervision (BCBS), arise from the impacts of climate change or efforts to mitigate them. Climate-related physical and transition risk drivers can translate into traditional financial risk categories like credit, market, operational, liquidity, strategic and reputational risks. CRFR can materialize over varying time horizons, often exceeding traditional capital planning periods (BCBS 2022, 2024). However, regulatory approaches to CRFR are still evolving, with some jurisdictions not calling out CRFR explicitly or integrating CRFR into broader concepts like environmental risk or Environmental, Social and Governance (ESG) risk. Increasingly, countries are also incorporating nature-related financial risks, a broader concept encompassing CRFR and defined in NGFS (2024).

While the BCBS does not define ESG risks, European Banking Authority (EBA, 2021) provides a useful reference, which is being incorporated into EBA's ESG risk management guidelines (EBA, 2024): ESG risks are the risks of any negative financial impact on the FSP stemming from the impacts of ESG factors on its counterparties or invested assets. ESG factors can have a positive or negative impact on the financial performance or solvency of FSP counterparties (or its invested assets). Climate risks are a subcategory of environmental risks, and these are heavily interlinked and reinforce each other. ESG risks can materialize in two ways, reflecting their potential double materiality. On the financial materiality side (outside-in perspective), the financial performance of a counterparty (e.g. a borrower) can be affected by ESG factors. For example, the introduction of a carbon tax may decrease the profitability of carbon-intensive businesses. On the environmental, social or governance materiality side (inside-out perspective), the activities of the counterparty may have a negative impact on ESG factors, for example by emitting greenhouse gases (GHG), which may in turn become financially material

for this counterparty through triggering or reinforcing a negative outside-in impact. The double materiality concept must be applied by FSPs for all ESG factors, although EBA's current focus is on environmental (including climate) risks (EBA 2024).

To address the varying approaches, this paper adopts a broad definition of climate-related regulation, encompassing climate and other environmental risks. The focus is on these, but in a few cases we mention specific requirements addressing closely-related social risks when relevant for our analysis. This approach reflects the interlinkages between ESG factors and CRFR, and the fact that 26 of 66 countries integrate CRFR within their ESG frameworks, 14 of which use the above concept of double materiality (Sustainable Banking and Finance Network (SBFN) 2024). This paper also considers the explicit development mandates of many FSAs in EMDEs (World Bank 2024), which pursue mixed objectives through climate-related regulation.

In this paper, climate-related regulation comprises any of the following (see [Table 1](#) for the full typology and country examples):

- **Requirements to address risks** (climate and other environmental risks)
- **Disclosure requirements**
- **Green or sustainable finance taxonomies and product standards**

This paper focuses on credit provision, specifically analyzing regulation affecting the banking sector. The analysis applies to nonbank credit providers to the extent that climate-related financial regulation applies to them. The definition of climate-related financial regulation includes green or sustainable finance taxonomies, even when these are economy-wide laws or guidance documents rather than sector-specific

## BOX 1. Definition of climate-related financial regulation in this paper (continued)

regulation. The analysis also includes voluntary guidance issued by FSAs, noting the growing number of mandatory, climate-related regulation. This broad definition enables a comprehensive analysis of financial exclusion pathways, including those arising from interactions between different types of regulation.

The definition of climate-related regulation excludes public policy tools like lending targets, targeted refinancing operations (TROs), credit subsidies,

interest rate caps, and fiscal measures such as rebates or carbon taxes, which are addressed only briefly in this paper. It also excludes international standards but acknowledges their influence on regulatory reforms in EMDEs. Additionally, regulatory measures supporting financial sector greening, such as digitalization or climate disaster contingency plans, are outside the scope of this analysis. This focused approach ensures a clear examination of climate-related regulation impacting credit provision.

(WBG, IMF, OECD 2023). FSAs in advanced economies and a growing number of emerging markets and developing economies (EMDEs) have issued climate-related financial regulation, defined in Box 1.<sup>2</sup>

Climate-related regulation is crucial to preserve financial stability and to support financial inclusion: without safe and sound FSPs, inclusive finance is unlikely to advance. Also, stricter risk management requirements could promote technological innovation that supports inclusive finance, and in particular inclusive climate finance. Climate-related regulation could, nonetheless, lead to financial exclusion. For instance, FSPs may adopt overly conservative approaches that exclude vulnerable groups exposed to physical risks such as flooding and drought. In addition to risk-avoidance strategies, other pathways from climate-related regulation to financial exclusion could unfold.

The World Bank (2024) makes an early assessment of how climate-related regulation could support financial stability and boost climate finance. Yet, the impact on financial inclusion has been less explored. Climate-related regulation could affect the ability or the incentives of FSPs to serve riskier, less profitable, vulnerable customers, potentially reducing inclusive climate finance or inclusive finance more broadly. Despite the limited experience

so far with this type of regulation, there is emerging evidence that it could exacerbate financial exclusion in EMDEs. The regulatory reforms in EMDEs are often shaped by international developments, including those in advanced economies like the European Union (EU), which may not fully align with EMDEs' needs. For instance, while advanced economies like the EU prioritize climate mitigation, such as reducing GHG emissions, most EMDEs must prioritize adaptation and resilience due to their high vulnerability to physical risks relatively low emissions (World Bank 2024).

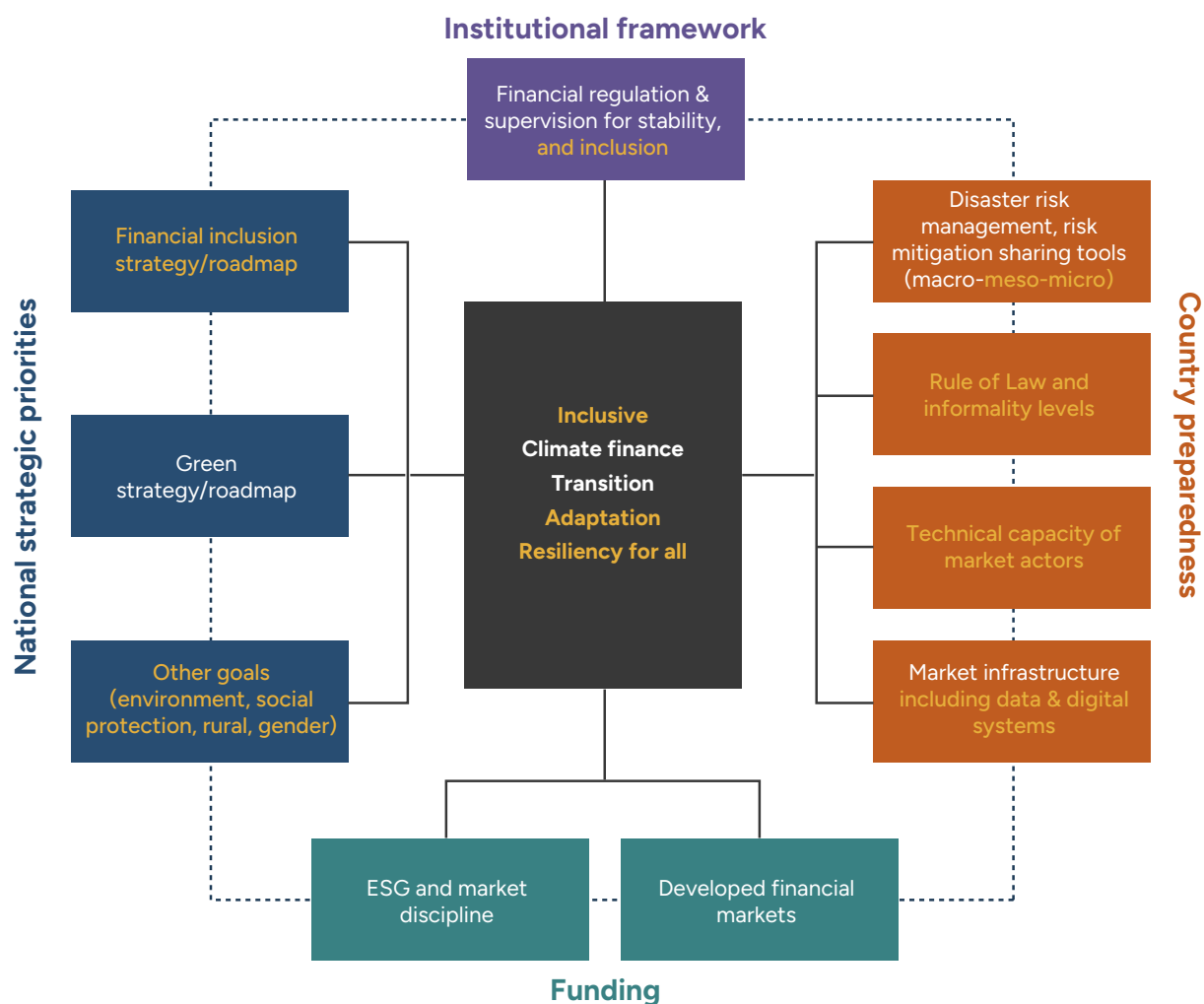
The link between climate-related regulation and financial exclusion may not be immediately apparent for FSAs. However, recognizing that the most vulnerable groups in EMDEs – in particular women in low-income countries (Notta and Zetterli 2023) – are disproportionately affected by climate risks, a legitimate question arises: Will climate-related regulation also disproportionately affect them?

Addressing the challenges of climate change in EMDEs requires a holistic approach (Figure 2) that enables inclusive finance –including inclusive climate finance for adaptation, resilience and a just transition– with a focus on the priorities and unique conditions of vulnerable groups in EMDEs (reflected in orange colored text in the figure). The financial exclusion risk

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<sup>2</sup> EMDEs are at different stages of development in this area, as per the SBFN Data Portal, accessed on July 10, 2024.

FIGURE 2. Holistic approach to create an enabling environment for inclusive finance in EMDEs



Source: Authors

from the introduction of climate-related regulation in EMDEs may differ significantly from those in advanced economies due to broader contextual weaknesses, such as inadequate implementation of environmental laws, insufficient financial infrastructure, challenging business environments, and limited technical capacity. Incorporating a financial inclusion lens into regulatory responses to climate change is crucial for EMDEs to avoid creating a vicious cycle of exclusion, climate vulnerability, and financial instability. Financial exclusion risks must be addressed, and this entails considering the key aspects of the institutional framework, country preparedness, funding, national strategic priorities, and the synergies between financial stability, financial

inclusion, and climate goals. All the factors boosting or hindering the country's readiness to enhance climate finance should be considered, recognizing that climate-related regulation is just one aspect of the enabling environment.

With the intent to contribute to holistic responses in EMDEs, this paper identifies pathways through which climate-related regulation could impact financial inclusion, with a focus on the provision of credit to vulnerable groups. The focus on credit is due to its prominence as the main form of financing available to these groups in EMDEs, and because a good portion

of the regulatory action in EMDEs has been directed towards lending activities.

Our analysis examines how the introduction of climate-related regulation can change the incentives or the ability of lenders to serve segments such as Micro, Small and Medium Enterprise (MSMEs), low-income households and smallholder farmers in EMDEs. Our analysis is informed by a desk-based review of the literature, of regulation in EMDEs and in the EU, and of international standards and guidance, in addition to in-depth analyses of climate-related regulation in Bangladesh, Brazil and Colombia.

This paper describes the current regulatory developments internationally, in the EU and in EMDEs, followed by an analysis of the pathways via which climate-related regulation could lead to financial exclusion in EMDEs. It also provides recommendations to minimize the exclusion risk. The last section presents suggestions for further research.

# The Evolving Regulatory Landscape

**W**ITH THE CREATION OF THE G20-SFWG in 2021, a wave of international and national initiatives followed.<sup>3</sup> Climate change is an area of ongoing development within financial regulation worldwide, particularly in EMDEs, but initiatives of Standard Setting Bodies (SSBs) and other international organizations, as well as regulatory reforms in the EU, are already influencing climate-related regulation in EMDEs.<sup>4</sup>

## International response

SSBs relevant to credit markets, the focus of this paper, include the FSB, the Basel Committee on Banking Supervision (BCBS), and the International Sustainability Standards Board (ISSB).<sup>5</sup>

Since 2021, the FSB has been coordinating the SSBs' work on CRFR, helping to ensure a cogent response that underpins financial stability. Besides its 2021 climate roadmap, the FSB has published analyses on system-wide and cross-sector implications of climate risk and issued specific recommendations for FSAs (FSB 2022). These include, inter alia, moving towards

standardized regulatory reporting of CRFR; accounting for interdependencies between physical and transition risks, geographical and sectoral risks, and system-wide aspects such as indirect exposures; expanding macro analyses beyond credit and market risks; and aligning the definition of CRFR to global standards. More recently, the FSB published a stock take on regulatory and supervisory approaches to nature-related risks (FSB 2024).

With particular importance to credit provision, BCBS sets minimum standards in the banking sector and identifies CRFR as an integral element of bank risk management and supervisory evaluation, having issued in 2022 the Principles for Effective Management and Supervision of CRFR (CRFR principles). Furthermore, in 2024 the BCBS updated its Core Principles for Effective Banking Supervision (Core Principles) to, among other changes, make explicit reference to CRFR (BCBS 2024).<sup>6</sup> The updated Core Principles have been endorsed by 90 jurisdictions (BCBS members and non-members), and will likely be gradually adopted by most EMDEs. One reason being that the Core Principles are used in external assessments such as the joint IMF-World Bank Financial Sector Assessment Program

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- 3 Mark Carney's 2015 seminal speech (Carney 2015) can also be considered a major influence for the regulatory reforms that were to come.
  - 4 For instance, D'Orazio and Popoyan (2023) found a positive statistically significant relationship between adopting climate-related regulation and being a member of platforms such as the SBFN). SBFN's 2024 Global Progress Report highlights that 28 out of 66 countries refer to international standards in their climate-related regulation.
  - 5 Other markets are also key for inclusive finance and have their own SSBs. Insurance, for instance, is fundamental to helping vulnerable groups increase climate resilience and adapt to climate change effects, but it is outside the scope of this report. The International Association of Insurance Supervisors (IAIS) is undergoing consultations to issue guidance for supervision of climate risk and targeted changes to the Insurance Core Principles.
  - 6 The BCBS started working on CRFR in 2020 with the establishment of a high-level Task Force on Climate-Related Financial Risks, which culminated in the recent update of the Core Principles.

(FSAP) and the assessors may recommend FSAs to enhance CRFR regulation and supervision in line with the updated standards.<sup>7</sup> Importantly, the BCBS calls for proportionality in implementing these standards.

In 2023 the ISSB published the two sustainability reporting standards, International Financial Reporting Standards (IFRS) S1, outlining general sustainability disclosure requirements, and IFRS S2, focusing on climate-related disclosures.<sup>8</sup> More than 20 jurisdictions have already adopted or are taking steps to adopt these standards (IFRS 2024). The ISSB is now working on standards for disclosure of climate transition plans and emissions (Green Central Banking 2024). These standards ought to have a positive impact on climate finance but could also create new cost and capacity challenges for FSPs.

Several other international organizations play an important role by supporting FSAs in EMDEs in the design and implementation of regulatory reforms via peer exchange, technical assistance, capacity building and knowledge products. Perhaps the most influential of such bodies has been the NGFS, a peer exchange platform comprised of over 100 central banks and financial supervisors, created in 2017 to identify best practices related to climate and environmental risks in the financial sector. Other important players include the WBG, the IMF, SBFN, and OECD. A list of the most relevant organizations is found in [Annex 4](#).

## The EU

The EU's encompassing reforms to embed ESG risks into the financial sector regulatory and supervisory framework have been highly influential in EMDEs. One of the most relevant is the EU taxonomy, which has become a global reference. The EU taxonomy guides investment decisions in the EU and by EU-based

players, including when investing abroad. See a primer on taxonomies in [Box 2](#).

Also, EU FSAs have issued new reporting requirements, and various supervisory expectations and guidance. Examples include the introduction of climate-related and environmental risk management obligations for FSPs. FSPs are required to consider climate-related and environmental risks in their classification and collateral valuation, and there are specific requirements for credit underwriting and portfolio monitoring. Additionally, EU FSAs have discussed but not adopted adjustments to capital requirements to account for climate-related and environmental risks. Finally, the European Central Bank (ECB) has been applying capital surcharges since 2022 and warned that it will impose daily fines on FSPs that fail to meet supervisory expectations related to climate and environmental risks across their portfolios (ECB 2024a).

## The EMDEs

Climate-related regulation and supervision in EMDEs are at various stages of development, but the trend is clearly towards more complete and mandatory regulatory frameworks covering climate and environmental risks. SBFN's 2024 Global Progress Brief (SBFN 2024) identifies regulatory and supervisory developments across numerous EMDEs, such as Bangladesh, Brazil, China, Colombia, Georgia, Mexico, and the Philippines. Overall, significant action is concentrated in middle-income countries (World Bank 2024), but a total of 26 out of 66 countries reporting to SBFN having introduced regulation dealing with climate risk management.<sup>9</sup> Twelve have undertaken assessments to identify systemic ESG risks in key lending portfolios (SBFN 2024).

No single EMDE seems to have implemented the full range of climate-related regulation listed in [Table 1](#).

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7 Adrian et al (2022) describe the approaches to analyze climate risks in FSAPs.

8 The ISSB was created in 2021 to push for standardization of sustainability reporting, continuing and building on the work of the now extinct Taskforce on Climate-related Financial Disclosures (TCFD).

9 Of these, only 16 cover nonbank sectors.

The most common regulations in place are general risk management requirements and prudential disclosures. Among these, the approach has been to incorporate climate and other environmental risks into the existing risk management framework. Nine countries (out of 66) have integrated nature-related financial risks into regulation addressing climate and other environmental risks, and 11 have issued requirements related to transition plans.<sup>10</sup>

A notable development is the growing number, among EMDEs, of green or sustainable finance taxonomies, as part of their efforts to boost climate finance. These remain largely voluntary. According to the World Bank (2024), taxonomies exist in 10 percent of EMDEs (SBFN 2024 reports 13-member countries with taxonomies, while another 11 are developing these), and less than 20 percent of these have been incorporated into financial regulation (as opposed to 95 percent in advanced economies). Among the 11 SBFN members countries that have a taxonomy, eight refer in some way to the EU taxonomy (SBFN 2024) and two (Colombia and South Africa) have expressly used the EU taxonomy as a model. Most taxonomies lean towards a focus on mitigation objectives, despite the urgent need for adaptation and increased resilience in EMDEs. Due to the critical role taxonomies play in climate finance and in the analyses included in this paper, it is crucial to understand what they are and how they work (see Box 2).

These taxonomies can be adopted at the national level for example by a law; restricted to the financial sector such as via financial regulation; or limited to certain market participants (e.g. the Climate Bond Initiative). Their implementation by corporations and FSPs can be voluntary or mandatory, as in the case of national and financial sector taxonomies. Moreover, national taxonomies could impose disclosure requirements on real sector enterprises in addition to FSPs. In several

jurisdictions, such as the EU, China, Bangladesh, and Colombia, taxonomies are mandatory for FSPs.

When green or sustainable finance taxonomies are incorporated into financial regulation, they do not direct lending or investment but restrict the use of the terms “green” and/or “sustainable”. That is, only taxonomy-aligned investments, including loans, can be reported as green/sustainable. Alignment with the taxonomy can also be used as a condition for FSPs to access climate finance flows and/or support such as central bank TROs or credit guarantee schemes (Carvajal and Didier Brandão 2024). When a taxonomy is introduced into financial regulation, loans and investments disclosed as green may suffer a sudden reduction. Also, in countries like Bangladesh, the FSAs set minimum targets for taxonomy-aligned lending. Therefore, these frameworks are highly relevant for our analysis, because they may change FSP incentives or ability to serve certain segments (see Pathway 1), increase costs for FSPs (see Pathway 2), or impact their access to funds (see Pathway 3).

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<sup>10</sup> Transition plans detail objectives, steps to be taken, and frameworks for accountability to ensure that FSP operations are consistent with a sustainable trajectory. According to NGFS (2023), credible transition plans can communicate the actions a corporate intends to take to achieve its transition strategy and, for financial regulators, it can minimize the risk of greenwashing, including enabling microprudential supervisors to place reliance on the information and the implications for the financial risks that an FSP faces.

## BOX 2. What are green or sustainable finance taxonomies and how do they work?

Green or sustainable finance taxonomies are classification systems for identifying economic activities or assets that support the achievement of specific sustainability objectives. Such objectives are aligned with high-level policy goals established in international agreements and national strategies. These taxonomies predominantly cover environmental objectives such as climate change mitigation and climate change adaptation but can also include social objectives. These frameworks provide clarity for investors and other stakeholders about the sustainability benefits of a given asset, assisting their decision-making (BIS 2021) while minimizing the risks of greenwashing. However, because these taxonomies reflect the specific context of each jurisdiction, their cross-border applicability is limited. This could create costs and complexity for cross-border investments, which are crucial for achieving EMDE sustainability objectives.

Green or sustainable finance taxonomies use assessment criteria to determine whether an asset can be classified as sustainable, i.e. taxonomy-aligned. Assessment criteria are used by all taxonomies, but they range from complex systems containing metrics and thresholds (e.g. the technical screening criteria of the EU taxonomy) plus additional criteria, like other Do No Significant Harm objectives, to simpler versions guided by high-level principles or identification of a list of activities (e.g. Bangladesh Bank's taxonomy). Depending on the level of complexity, these criteria can be difficult or too costly to implement for small-size investments, and by less sophisticated stakeholders such as MSMEs and low-income borrowers.

Crucially, assessing the sustainability of investments requires measuring the achievement of the stated sustainability objectives. In turn, and because climate change mitigation objectives are easier to

quantify (e.g. measuring GHG emissions) compared to climate change adaptation (e.g. measuring longer-term effects), most green or sustainable finance taxonomies have leaned towards a focus on mitigation objectives, including in EMDEs where the need for adaptation and increased resilience are urgent.

These taxonomies can be adopted at the national level for example by a law; restricted to the financial sector such as via financial regulation; or limited to certain market participants (e.g. the Climate Bond Initiative). Their implementation by corporations and FSPs can be voluntary or mandatory, as in the case of national and financial sector taxonomies. Moreover, national taxonomies could impose disclosure requirements on real sector enterprises in addition to FSPs. In several jurisdictions, such as the EU, China, Bangladesh, and Colombia, taxonomies are mandatory for FSPs.

When green or sustainable finance taxonomies are incorporated into financial regulation, they do not direct lending or investment but restrict the use of the terms "green" and/or "sustainable". That is, only taxonomy-aligned investments, including loans, can be reported as green/sustainable. Alignment with the taxonomy can also be used as a condition for FSPs to access climate finance flows and/or support such as central bank TROs or credit guarantee schemes (Carvajal and Didier Brandão 2024). When a taxonomy is introduced into financial regulation, loans and investments disclosed as green may suffer a sudden reduction. Also, in countries like Bangladesh, the FSAs set minimum targets for taxonomy-aligned lending. Therefore, these frameworks are highly relevant for our analysis, because they may change FSP incentives or ability to serve certain segments (see Pathway 1), increase costs for FSPs (see Pathway 2), or impact their access to funds (see Pathway 3).

# Pathways of Financial Exclusion

## Scope of analysis and methodology

**WE ANALYZE THE POTENTIAL IMPACT** of climate-related regulation (as defined in [Box 1](#) and detailed in the table below) on FSPs in EMDEs, with a focus on the provision of credit to vulnerable groups. The focus on credit is due to its prominence as the main form of financing available to these segments, and because a good portion of the regulatory action in EMDEs has been directed toward lending activities.

The analysis is strictly limited to the potential exclusionary impacts arising from the introduction of climate-related regulation. It does not extend to evaluating their effectiveness in achieving their intended objectives related to safety and soundness, financial stability, transparency, market discipline, or the mobilization of climate finance.<sup>11</sup>

Our methodology comprised the following key steps:

1. **Desk review:** We conducted an extensive desk review of existing regulation in the EU and EMDEs. This also included a review of global initiatives and an analysis of research papers that presented typologies of climate-related regulation.

2. **Development of a typology of climate-related regulation:** Building on the insights from the desk review, we developed a unique typology of climate-related regulation (see [Box 1](#)), specifically focusing on those that impact lending activities.
3. **Analysis of impact pathways:** for each type of climate-related regulation of our typology, we analyzed and described the potential financial exclusion impact pathways (see detailed analysis in [Annex 3](#)). As noted earlier, although most EMDEs do not yet have mandatory regulation covering the entire typology, we include all types in our analysis, as the fluidity of ongoing reforms could swiftly change the framework in EMDEs. For instance, financial exclusion could result from capital-related measures eventually adopted in EMDEs.<sup>12</sup> Also, the calls for improving climate data for supervisory purposes (FSB 2022 and BCBS 2023) will probably lead EMDEs to introduce reporting requirements that are included in our typology. In this vein, our analysis is forward-looking.
4. **Field research:** To validate and enrich our findings, we undertook three country visits – Bangladesh, Brazil, and Colombia – between February and July 2024 and during which we interviewed officials from sustainability, financial inclusion, and prudential supervision departments of FSAs and representatives from FSPs such as sustainability,

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11 For such discussions see, for instance, World Bank (2024), Fan and Gao (2024), Demekas and Grippa (2021), Goel et al (2022), Dikau and Vols (2021)

12 The Central Bank of Kenya, for instance, has announced that it may impose additional capital requirements to account for climate risks at banks (Lee Katy 2024).

TABLE 1. **Typology of climate-related regulation analyzed in this paper**

Climate-related financial regulation	Main objectives of the regulation and examples of jurisdictions with such regulation
<b>Requirements to address risks</b>	
<p><b>Broad risk management obligations</b></p> <ul style="list-style-type: none"> <li>• Introduction of climate and other environmental risks into business models, strategy and risk management frameworks.</li> <li>• Governance requirements (e.g. obligation to assign explicit responsibilities for such risks at the Board and throughout the FSP).</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure FSPs understand and assess the potential impacts of climate and other environmental risks on their businesses and on the market in which they operate. Ensure FSPs adequately manage the financial risks stemming from climate and other environmental factors i.e. the impact of these on traditional financial risks, such as operational, credit and liquidity risk over different time horizons. Ensure accountability for the management and disclosure of these risks.</li> <li>• Examples: Bangladesh, Brazil, China, El Salvador, EU, Ghana, Nepal, Pakistan, Paraguay.</li> </ul>
<p><b>Credit underwriting and credit portfolio management requirements</b></p> <p>Climate and other environmental risks assessment on borrowers, including due diligence procedures, exclusion lists, portfolio monitoring requirements in relation to these risks.</p>	<ul style="list-style-type: none"> <li>• Ensure a minimum level of standardization in: (i) the approval of green/sustainable credit operations; (ii) the inclusion of climate and other environmental risk in credit portfolio management.</li> <li>• Examples: Bangladesh, Brazil, EU, Honduras, Morocco, Nepal, Paraguay, Pakistan, Peru, Vietnam.</li> </ul>
<p><b>Credit risk ratios</b></p> <ul style="list-style-type: none"> <li>• Differentiated loan provisioning.</li> <li>• Caps to maximum exposure to certain sectors, geographies or customers.</li> </ul>	<p>Ensure FSPs assess and manage the risks posed by concentrations of exposures (including collateral) to counterparties, industries, economic sectors, or geographic regions which may present a higher degree of vulnerability to climate and other environmental risks.</p>
<p><b>Differentiated capital requirements</b></p> <ul style="list-style-type: none"> <li>• <b>Pillar 1:</b> Risk weight asset (RWA) adjustments via Green Supporting Factor (GSF) and/or Brown Penalizing Factor (BPF). BPF may be also be referred to as “cap dirty” or “capital requirements for dirty exposures” (FSI 2023).</li> <li>• <b>Pillar 2:</b> Insertion of climate and other environmental risk into internal capital adequacy assessment process (ICAAP) or capital surcharges based on supervisory findings (e.g. poor climate and other environmental risk management).</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure capital adequacy properly accounts for climate and other environmental risks.</li> <li>• Promote green lending via capital charges/releases.</li> <li>• Set aside a cushion for climate shocks unaddressed by capital adequacy.</li> <li>• Examples: Brazil (Internal Capital Adequacy Assessment Process (ICAAP), simplified ICAAP), EU (ICAAP), Hungary (Green Supporting Factor (GSF) applied to Pillar 2 requirements).</li> </ul>
<p><b>Stress testing and scenario analysis</b></p> <ul style="list-style-type: none"> <li>• Requirement for FSPs to conduct climate stress testing using various climate scenarios, for purposes of adjusting their capital and other tools to mitigate climate and other environmental risks, as part of pillar 2 supervisory review process.</li> <li>• Stress tests by the FSA for macroprudential supervision purposes.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that FSPs prepare themselves for climate scenarios and understand and manage the impact on their risk profile and mitigation tools.</li> <li>• Understand how systemic risk changes in different climate scenarios.</li> <li>• Examples: Colombia, EU, Morocco.</li> </ul>

TABLE 1. **Typology of climate-related regulation analyzed in this paper** (continued)

Climate-related financial regulation	Main objectives of the regulation and examples of jurisdictions with such regulation
<p><b>Transition plans</b></p> <ul style="list-style-type: none"> <li>• Requirement for FSPs to have and publicize transition plans.</li> <li>• Supervisory assessment and monitoring of transition plans.</li> </ul>	<ul style="list-style-type: none"> <li>• Transition plans detail objectives, steps to be taken, and frameworks for accountability to ensure that FSP operations are consistent with a sustainable trajectory. The aim is to ensure transparency on FSP plans to transition away from carbon-intensive activities and address risks stemming from the economy's transition towards a green economy. According to NGFS (2023), transition plans can also minimize the risk of greenwashing.</li> <li>• Examples: EU, Philippines, Brazil (under consultation).</li> </ul>
<b>Requirements to address risks</b>	
<p><b>Macroprudential capital-based and borrower-based measures (BBM)</b></p> <ul style="list-style-type: none"> <li>• Systemic risk buffer (SyRB).</li> <li>• Sectoral SyRB.</li> <li>• Adjustments to capital adequacy requirement (e.g. by sector, activity, etc.)</li> <li>• Debt-to-income ratio for green loans.</li> <li>• Loan-to-value (LTV) ratio, e.g. for green mortgages.</li> <li>• Maturity limits (loan term limits).</li> </ul>	<ul style="list-style-type: none"> <li>• Set aside buffers for systemic risk not covered by individual FSP capital adequacy levels, ensure management at systemic level of concentration risks related to climate and other environmental risks, prevent buildup of risks by ensuring that climate and other environmental risks are incorporated in the evaluation of borrower's solvency and collateral value.</li> <li>• Examples: Indonesia and the Netherlands (LTV increased for green mortgages), EU (exploring several measures).</li> </ul>
<b>Disclosure requirements</b>	
<p><b>Prudential disclosure (Pillar 3)</b></p> <p>-Qualitative and quantitative climate and other environmental risk metrics, covering, inter alia, transition risk, physical risk, portfolio decarbonization, and mobilization of transition finance. For comprehensive analysis of prudential disclosure metrics for CRFR, see BCBS (2023) and FSB (2022).</p>	<ul style="list-style-type: none"> <li>• Ensure transparency of climate and other environmental risks management practices and risk appetite by FSPs to support supervisory oversight.</li> <li>• Examples: Brazil (under consultation), EU.</li> </ul>
<p><b>Sustainability reporting standards</b></p> <p>-IFRS S1 and S2 or equivalent regulation.</p>	<ul style="list-style-type: none"> <li>• Ensure alignment of sustainability-related financial public disclosures, including climate and other environmental risks, to promote climate finance, enhance market discipline and enable monitoring of progress towards climate finance goals, by increasing comparability of disclosures and accountability of enterprises, including FSPs, and improve data from the real sector for use by FSPs.</li> <li>• Examples: Several countries are in the process of implementing the IFRS S1 and S2 standards or equivalent regulation, including Bangladesh, Colombia (pending regulatory validation), EU (Corporate Sustainability Reporting Directive – CSRD), Malaysia, Brazil (under consultation).</li> </ul>

TABLE 1. **Typology of climate-related regulation analyzed in this paper** (continued)

Climate-related financial regulation	Main objectives of the regulation and examples of jurisdictions with such regulation
<p><b>Taxonomy-alignment disclosures</b></p>	<ul style="list-style-type: none"> <li>Require for FSPs to disclose the extent to which their assets are aligned with environmentally sustainable activities, as defined in a specific taxonomy for green/sustainable activities.</li> <li>Examples: EU (Green Asset Ratio), Colombia (green activities disclosed to be aligned with the TVC).</li> </ul>
<p><b>Green or sustainable finance taxonomies and product standards</b></p>	
<p><b>Green or sustainable finance taxonomies</b> (both taxonomies developed domestically, and taxonomies developed in other jurisdictions, when they can impact EMDEs).</p>	<ul style="list-style-type: none"> <li>Provide a common classification system for the identification of green or sustainable activities or investments, aligned with a jurisdiction's climate objectives (see details in Box 2)-</li> <li>Examples: Bangladesh, Brazil (draft), Colombia, Georgia, Ghana, EU, Indonesia, Kazakhstan, Kenya (draft), Malaysia, South Africa, Sri Lanka.</li> </ul>
<p><b>Green or sustainable finance taxonomies and product standards</b></p>	
<p><b>Standards for green/sustainable products</b></p>	<ul style="list-style-type: none"> <li>Provide standardized definitions for green or sustainable financial products (e.g. green loans), for purposes of applying differentiated treatment under prudential rules (e.g. be subject to or exempted from specific requirements), benefitting from policy tools (e.g. credit guarantees), or counting towards minimum lending targets that may exist in a jurisdiction.</li> <li>Examples: Bangladesh, China, EU (exploring green mortgages), Vietnam.</li> </ul>

compliance, and lending operations specialists. These interviews provided critical insights into the practical implications of the regulation on FSPs' lending practices. In Brazil and Bangladesh, we also engaged local vendors<sup>13</sup> who collected additional insights and relevant data.

This methodology ensured a robust analysis, combining the conceptual framework with data analysis (in the case of Brazil) to offer a comprehensive understanding of the pathways through which climate-related regulation may affect FSPs' lending practices.

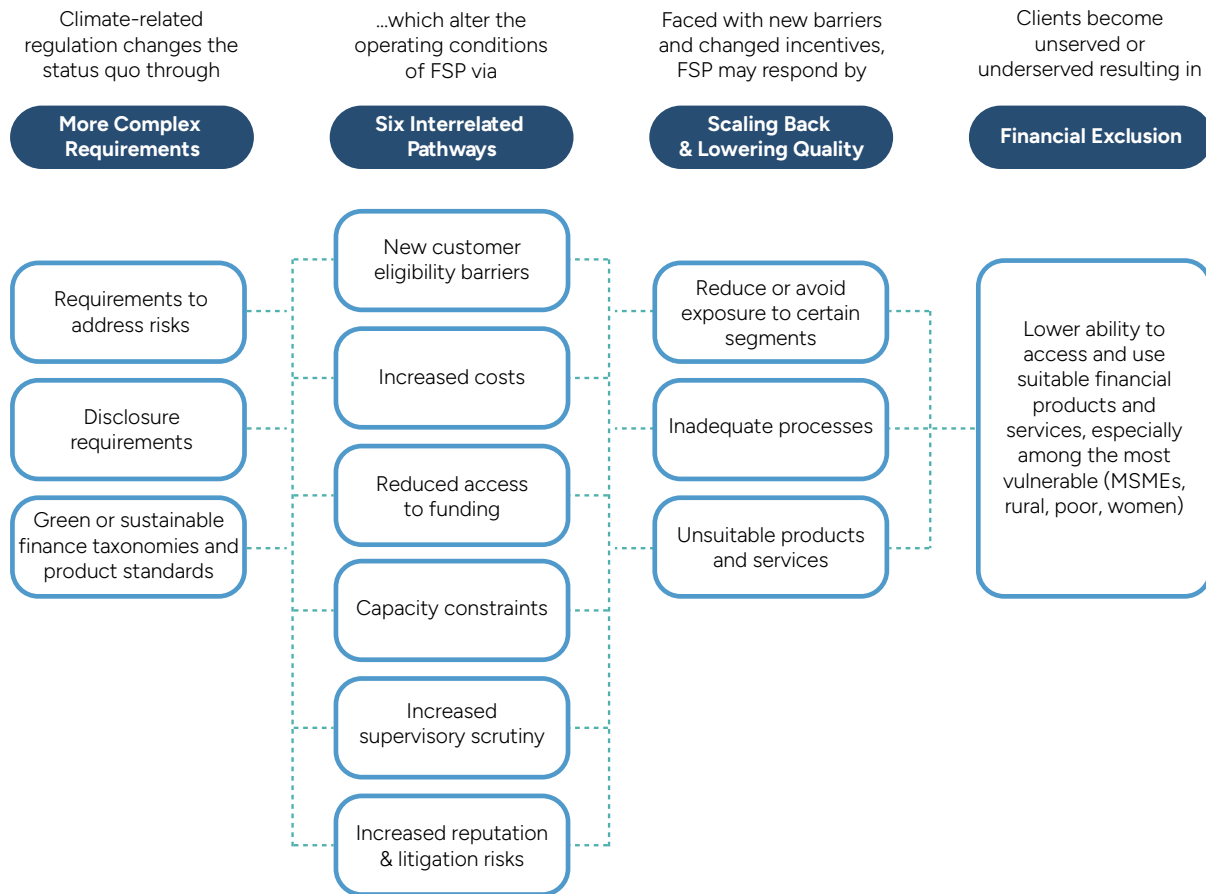
## Types of impact pathways

Impact pathways are defined as the avenues through which climate-related regulation (defined in [Box 1](#)) may alter the capacity and/or incentives of FSPs in EMDEs to lend to vulnerable groups: MSMEs, smallholder farmers, and low-income segments, especially those that are particularly vulnerable to climate risks such as women in low-income countries (Notta and Zetterli 2023). These pathways consider potential exclusion from all types of finance, although inclusive climate finance may be particularly affected.

We pay due attention to aspects of the broader context of EMDEs that may impact regulatory implementation,

13 Agroicone in Brazil and Pi Strategy in Bangladesh.

FIGURE 3. Pathways from climate-related regulation to financial exclusion



Source: Authors

and hence, exacerbate potential exclusionary effects. These include the enforcement of environmental laws, and key financial (e.g. credit data) and non-financial infrastructure such as data on rural properties and public lands, environmental data such as deforestation and land use patterns, and business licensing.

We have identified six pathways:

- Pathway 1: New customer eligibility barriers
- Pathway 2: Increased cost
- Pathway 3: Reduced access to funding
- Pathway 4: Capacity constraints
- Pathway 5: Increased supervisory scrutiny, and
- Pathway 6: Increased reputation and litigation risk

As shown in Figure 3, climate-related regulation introduces new, complex requirements for FSPs, which impact FSPs via one or more the six pathways. In response to these, FSPs may reduce exposure to certain segments or avoid them altogether, adopt new or keep existing processes that are inadequate, adjust their products without meeting the needs of vulnerable segments, or use a combination of these strategies. As a consequence, customers can be negatively impacted, including vulnerable groups in EMDEs, who may already be underserved. Women could be particularly affected, not only due to the differential impact of climate change on them (Notta and Zetterli 2023), but also due to their lower capacity to meet requirements to access financial products and services, such as lower income or lack of documentation.

The pathways are not alternative, independent transmission channels, but often interrelated and mutually reinforcing. For instance, new regulatory requirements on client eligibility for lending operations – some of which could lead to exclusion – could increase costs for FSPs, which could lead them to impose new eligibility criteria, to ensure profitability. Funding restrictions can directly lead to reduced exposure to some markets, or indirectly, such as via increased costs. The purpose of presenting the six pathways separately is to highlight and illustrate the various ways climate-related financial regulation could contribute to financial exclusion, helping FSAs to identify the exclusion risks in their own context. This is particularly important considering that exclusion risks may be difficult for FSAs to detect and there is limited empirical evidence to date. Our intent is to help FSAs design the combination of regulatory, supervisory, and non-regulatory measures that could help counter exclusion.

Each regulation can directly impact specific types of credit products or clients (e.g. rural), whereas others will indirectly impact credit and be non-specific. For example, credit underwriting requirements tend to be specific for types of products or client segments and, hence, may have a direct and specific impact on these. In turn, capital-based regulation will have indirect impacts and, when it does not address a type of client or product, these impacts will be non-specific, affecting lending in general. Each climate-related regulation (see [Table 1](#)) could have exclusionary effects via one or more pathways (see analysis in [Annex 3](#)).

Regardless, the emerging regulatory framework can have disparate effects on vulnerable segments, which ought to be more pronounced in EMDEs due to pre-existing broader context issues that become more relevant with the introduction of these regulations. An example is poor data on small rural properties: while this shortcoming predates the regulation under discussion, the introduction of broad climate and other environmental risk management obligations makes it more relevant for financial inclusion. This is because FSPs may have been willing to lend to smallholder farmers lacking such data, would now see this data as

indispensable. Smallholder farmers, which are severely underserved by the financial sector in EMDEs, could be further marginalized. Finally, some types of regulation such as requirements on transition plans may not only impact segments that are climate-exposed today, but also reduce the ability or willingness of FSPs to finance their transition, as highlighted in our interviews and noted by World Bank (2024).

### **PATHWAY 1: NEW CUSTOMER ELIGIBILITY BARRIERS**

Credit underwriting and portfolio management rules such as those requiring FSPs to conduct climate and/or environmental due diligence may prevent or discourage them from serving certain segments, sectors or geographies. These requirements can disproportionately exclude vulnerable groups who are not able to fulfill information requests. The risk is higher in EMDEs, where broader systemic weaknesses compound the issue. For instance, it is often difficult, expensive or time-consuming for borrowers to produce green certification, or even business licenses and property certification, in contexts where informal enterprises and smallholder farmers are the majority. They also face additional challenges such as low literacy, limited connectivity, and scarce resources. Women-led businesses are particularly vulnerable to exclusion, as they tend to be smaller, more informal, and have fewer available funds to meet additional requirements.

The disconnect between credit underwriting requirements with the broader country context (see Box 3 for examples) exacerbates the risk of financial exclusion. It is important to note that although small transactions or vulnerable customer segments may be exempted from these additional requirements in some EMDEs, they might still be subject to screening by FSPs regardless because FSPs need to comply with environmental laws. In fact, some interviewed FSPs already apply requirements stricter than the regulation, for reasons such as to reduce litigation risk (see Pathway 6); avoid and greater supervisory scrutiny (see Pathway 5) and lack of adequate risk management capacity (see Pathway 4). Although none of the FSPs

### BOX 3. Illustrating customer eligibility barriers created by credit underwriting requirements

**In Brazil**, the introduction in the rural credit regulation of a requirement for all rural credit clients to produce an Environmental Rural Certification (locally known as CAR), has contributed to a reduction in the number of family farmers accessing subsidized credit via the national rural credit policy. CAR is a requirement for all rural properties, according to environmental law, but it was not fully enforced by financial regulation until 2019. Access to subsidized credit was already very low, with only 15 percent of family farmers having a loan, but this fell further by 48%, from 263.8 thousand in 2019/2020 to 137.6 thousand in 2023/2024. The fall was especially acute in regions where the most vulnerable subsistence farmers are located. To obtain a CAR (which is done over the internet), vulnerable family farmers face challenges ranging from not being able to read, not understanding what is being asked in the CAR, or not having equipment or connectivity. Most other reasons for the significant reduction in the number of vulnerable borrowers relate to eligibility requirements (e.g. guarantees), some of which are set by regulations for some types of loans, and some are imposed by FSPs themselves, as they consider these loans a higher risk. See Brazil country case in [Annex 1](#).

**In Colombia**, FSPs need to ensure that borrowers comply with environmental laws. For instance, financing activities within protected lands may

increase an FSP's litigation risk due to infringement of environmental law. To verify whether a rural property overlays with protected lands, FSPs use the database managed by the environmental agency, but this database does not have enough granularity to allow the identification of very small properties (which are the majority of the rural properties in Colombia). The problem is compounded with the difficulty for some smallholders to prove property ownership, which is due to weaknesses in land registries. As a result, FSPs are discouraged from lending to these properties. See Colombia country case in [Annex 1](#).

**In Bangladesh**, regulations impose additional requirements if the borrower gets a poor evaluation of environmental and social risks in the first screening. This discourages FSPs from accepting the credit request in the first place. Banks must request and monitor the implementation of an action plan for borrowers to fix the weaknesses that led to the first score (e.g. improve working conditions in a factory). Also, the regulation requires entrepreneurs of a certain size to have green certification to access credit labeled as green, and a business license is needed to obtain a certification. However, most enterprises in Bangladesh are informal and face significant hurdles to obtain business licenses.

we interviewed reported having adjusted corporate strategies yet, such as by increasing minimum loan size and de-risking from certain segments, activities, or geographies, they all expressed concerns about the risk of exclusion via new customer eligibility barriers.

When credit underwriting and portfolio management requirements are too detailed (e.g. checklists and scoring systems), they leave little room for FSPs to adjust screening, risk rating, and product design to the varying realities of vulnerable groups and to individual customers. Moreover, in emerging scoring models to support the management of climate and other environmental risks, certain economic activities or

regions may be automatically rated as high-risk without consideration of other borrower characteristics and the local context.

Credit underwriting and portfolio management rules may also require FSPs to use exclusion lists and climate databases to protect public lands and avoid the financing of borrowers involved in violations of environmental and other laws. While these checks are legitimate and could protect vulnerable communities, FSPs may face challenges with the availability and accuracy of external databases. Finally, when standards for green or sustainable products are too restrictive (e.g. defining loan terms, target segment, delivery

channel, and interest rates), they could preclude FSPs from designing suitable products and services. This risk is higher when FSPs need to comply with strict policies to promote sustainable finance, such as minimum lending targets, as is the case in Bangladesh.

Regulatory measures such as credit underwriting and portfolio management requirements have a direct impact on customer eligibility, but other measures, especially green or sustainable finance taxonomies, are highly relevant as well. Our interviews indicate that these taxonomies (see [Box 2](#) for details) can change incentives and potentially shift lending away from some activities and customers. In EMDEs, high levels of informality, weak institutional frameworks, and poor data can make it costly or difficult for FSPs to demonstrate that a loan is green or sustainable according to a taxonomy, especially when its assessment criteria are not finely adjusted to the country's reality, including its data infrastructure. Hence, a loan granted to fund activities that could contribute to adaptation or resilience goals of vulnerable groups, such as converting a plantation crop to a drought-resistant cereal variety, may not be considered green. Consequently, FSPs may shift away from these activities.

There is emerging evidence of the above effects. In Bangladesh, FSPs steered their green lending to activities that unequivocally fit Bangladesh Bank's sustainable finance taxonomy, mostly benefiting existing, large customers. In Colombia, despite the efforts of the financial regulator to encourage FSPs to increase lending to the activities included in the taxonomy, FSPs struggle to find suitable business cases, partly because the taxonomy has a focus on mitigation activities that are not always aligned with the adaptation and resilience needs of many borrowers.<sup>14</sup>

The current assessment criteria in the taxonomy require actions such as ensuring environmental compliance and require a minimum level of technical expertise, both of which cannot be met by most MSMEs.

Likewise, transition planning requirements could also exacerbate the exclusion risks when not well-adjusted to the EMDE context. Although transition plans could benefit both FSPs and FSAs by outlining how FSPs will transition their business models, operations and processes, and manage the transition risks, they could trigger exclusion when not considering the unique challenges faced by vulnerable groups. This risk increases when FSPs are pressured or mandated to align transition plans with the climate and/or environmental policy goals of their jurisdictions,<sup>15</sup> particularly when these goals do not cater to the needs of vulnerable populations. FSPs may require borrowers to demonstrate contributions to climate goals, discouraging lending to those who cannot meet or afford complex information requirements or whose metrics don't align with taxonomy indicators.

MSMEs or low-income individuals may also be impacted indirectly by new customer eligibility barriers that don't apply to them. They may lose income when the borrowing conditions of a large player in their value chain deteriorate. This is an important issue for value chains related to activities that do not align with green or sustainable finance taxonomies, which in EMDEs, may include a large group of vulnerable communities. An example is the meat industry in Brazil, which is being impacted by the increasing pressure for FSPs to use simplistic indicators to determine whether they can be considered sustainable, such as methane gas emissions from cattle, which have been designed to fit the priorities of advanced economies. Such pressure is not due to climate-related regulation in Brazil, but to the

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14 The adaptation objective has been integrated into the TVC (Colombian Green Taxonomy or TVC, in its Spanish acronym) as one of five mutually dependent sustainability objectives, not alone, in relation to the soil and land-use sectors such as agriculture, forestry, and livestock. These sectors contribute approximately 59 percent of Colombia's GHG emissions, as noted in the TVC.

15 In the EU FSPs must develop and monitor the transition plans that include measurable targets to address the financial risks arising from ESG factors, including transition trends in the EU, particularly the goal of climate neutrality.

application of indicators used in the EU for purposes of implementing the EU taxonomy (see Pathway 3).<sup>16</sup>

## **PATHWAY 2: INCREASED COSTS**

Certain climate-related regulatory requirements will increase operating and regulatory costs, including costs associated with:

- Adjusting the governance and/or organizational structure (e.g. creating new units for management of climate and other environmental risks).
- Acquiring new systems or making adjustments to comply with new reporting and disclosure requirements (including new indicators), risk management obligations (including modelling and scoring), and scenario analyses.
- Collecting and aggregating new data.
- Developing and implementing taxonomy-aligned products.
- Hiring experts and external auditors specialized in climate and other environmental risks.
- Increasing regulatory capital.

In addition, costs can also be specific to lending transactions, including the extra time needed to implement environmental due diligence questionnaires; the process of verifying the information provided by customers; paying for third-party verification or setting up internal environmental due diligence processes or certification; and customer awareness procedures such as explaining the additional information they must provide.

Our interviews indicate that the costs of setting up internal capacity to comply with the new climate-related obligations are among the most significant and could potentially impact lending of all types, not

only climate finance. Some interviewees mentioned “unfeasible costs” that could discourage them from serving riskier, smaller or costlier clients. They also mentioned time-consuming procedures to ensure compliance with environmental laws.

Costs are still evolving and are likely to increase as EMDEs continue to issue new climate-related regulation. For instance, there is a risk that current discussions in international forums result in the application of additional capital requirements for non-taxonomy-aligned operations. This could further increase costs for FSPs. While FSPs reported not having yet changed commercial strategies, including pricing policies, and loan terms and conditions, there is a credible threat that risk-adjusted returns for small transactions could lead to changes in commercial strategies, resulting in exclusion.

## **PATHWAY 3: REDUCED ACCESS TO FUNDING**

Funding costs and sources are key in shaping FSPs’ lending strategies. The emergence of green or sustainable finance taxonomies plays an increasingly crucial role (see [Box 2](#) for an explanation on taxonomies), even when they are not immediately incorporated into financial regulation. There is growing pressure on FSPs to direct funds to activities aligned with such taxonomies whose assessment criteria are often skewed towards mitigation goals and not fully adjusted to the realities of EMDEs. For instance, in Colombia the taxonomy has been designed to primarily meet emission reduction goals, even though the country is not a major GHG emitter. Also, there is a close relationship between reduced funding and Pathway 1, as illustrated by the examples in this section.

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<sup>16</sup> A similar effect could result from disclosure requirements imposed on European corporates, most notably the Corporate Sustainable Reporting Directive (CSRD). Because the CSRD impacts value chains in which EU companies operate, large EMDE companies may end up in the scope of this regulation. One study showed that, among 734 large companies from EMDEs, 42 percent (310) fall under CSRD’s scope (World Benchmarking Alliance 2024). These disclosure obligations and the costs involved could have knock-on effects on entire value chains in EMDEs, potentially leading to loss of business or reduced income among vulnerable communities.

Meeting the assessment criteria set in green or sustainable finance taxonomies (see Box 2) can be cumbersome, especially for small loans and to borrowers with lower capacity. The problem is not only the assessment criteria, but also the indicators used for measurement and reporting, which are often inadequate to capture the reality of EMDEs. When investors impose alignment with a taxonomy that is not tailored to the EMDE context, in particular its adaptation and resilience needs, FSP access to funds, and climate funds in particular, may reduce. Also, taxonomies can prompt FSPs to reallocate their portfolios (Carvajal and Didier Brandão 2024) away from vulnerable groups regardless of their level of exposure climate risks.

FSPs operating in EMDEs can be impacted even if green or sustainable finance taxonomies are only implemented in the funder's home jurisdiction or when the funder is influenced by other jurisdictions like the EU. For instance, our interviews in Brazil confirmed that multilateral organizations, even those outside the EU and not obliged to implement the EU taxonomy, are already restricting funds to activities aligned with the EU taxonomy. Also, commercial funding by banks headquartered in the EU and operating in EMDEs could also be affected, since these entities need to adhere to the EU taxonomy in all their operations, within and outside the EU.

The EU taxonomy aims to meet EU climate goals such as de-carbonizing the economy and it is not designed to be transposed to EMDEs. Still, it serves as a model

#### BOX 4. **Climate-related regulation and financial exclusion in Colombia** (Detail in Appendix 1)

Colombia is a low contributor to global GHG emissions, accounting for just 0.40 percent of the global total,<sup>a</sup> but it is highly vulnerable to the impacts of climate change. World Bank projections indicate that, without adequate adaptation measures, climate change could reduce Colombia's GDP by up to 2.5 percent by 2050, disproportionately affecting low-income populations.<sup>b</sup> Still, the country has committed to an ambitious emissions reduction target of 51 percent by 2030 and net-zero emissions by 2050. Land-use sectors including forestry and agriculture account for 59 percent of Colombia's GHG emissions, driven by deforestation for agricultural expansion and livestock activities. Hence, improving agriculture and livestock systems are crucial for Colombia's climate agenda. The financial sector plays a critical role, but vulnerable groups like rural communities and MSMEs (which represent 98 percent of Colombia's enterprises) continue to face challenges in accessing credit. There are various public support

instruments to promote agricultural credit to vulnerable groups through national development banks, such as Finagro and Bancoldex. These are complemented by the Agricultural Guarantee Fund (FAG), as well as incentives for agricultural insurance and the Rural Capitalization Incentive (ICR), a non-reimbursable financial incentive for farmers and agricultural enterprises.

**Climate-related regulations in Colombia include the Colombian Green Taxonomy (TVC, in its Spanish acronym), launched in 2022** and quickly incorporated into the financial regulation issued by the Financial Superintendence of Colombia (SFC). The TVC's initial focus is on climate change mitigation goals, with adaptation and resilience goals being less prominent. Adaptation is mostly tackled indirectly via the principle of "do no significant harm" in achieving the other goals, and via its codependency with the positive externalities of addressing mitigation.<sup>c</sup>

a EDGAR database (Emissions Database for Global Atmospheric Research, 2022).

b World Bank (2023), Colombia Country Climate and Development Report.

c Climate Bonds Initiative (2023).

#### BOX 4. Climate-related regulation and financial exclusion in Colombia (Detail in Appendix 1) (continued)

**Starting in 2018, the SFC has been using research, consultation, and experimentation to develop its own climate-related regulation, following a phased and proportional approach.** Markedly, starting in 2021 it has issued voluntary guidelines which are gradually being turned into mandatory instruments. Its 2022 Roadmap for Greening the Colombian Banking System has set the tone of the gradual regulatory reforms that would follow. This approach has given time for FSPs to adapt practices and avoid sudden increases in compliance costs and capacity challenges during regulatory implementation. These measures are complemented by initiatives to promote innovation, improve data availability and transparency, test regulatory and supervisory tools and build capacity in environmental and social risks in the financial sector. Also, the SFC is developing a sustainability dashboard to track progress on issues such as FSP exposure to climate risks. Currently, only regulations introducing disclosure standards are mandatory, and other instruments serve as guidance for FSPs, towards future mandatory requirements. Indeed, SFC surveys with FSPs found significant progress in the implementation of such voluntary guidance. The timeline of these regulations, as they related to credit provision is summarized below:

- In 2021, requirement for large issuers in the capital markets to follow sustainability disclosure standards (**disclosure requirements**).
- In 2022, requirement for FSPs to align with the TVC in their financial disclosures or explain any disparities in the reporting of green or sustainable operations (**disclosure requirements**).
- In 2022, non-binding guidelines for the management of environmental and social risks, including climate-related risks, and disclosure of related financial risks. These are known as the ESRM Guidelines (**broad risk management requirements and disclosure requirements**).
- In 2023, non-binding Green Taxonomy Guidelines for Credit Institutions (**disclosure requirements**).
- In 2023, consultation ahead of issuing binding ESRM requirements in 2025.

- In 2024, requirement for FSPs to integrate an adverse climate scenarios into the 2024 stress test conducted within the supervisory review framework (**stress testing requirements**).

**Self-regulation standards, particularly those issued by the bank association Asobancaria, are closely observed by FSPs.** Of particular relevance is the General Guidelines for the Implementation of Environmental and Social Risk Analysis and Management (SARAS, in its Spanish acronym) introduced in 2016 and updated in 2021. SARAS provides guidance for FSPs to improve management of environmental and social risks and will probably be reinforced with SFC's planned binding ESRM requirements (item (v) above).

It is early days to measure the impact of these regulations on credit, but emerging evidence points to real risks of exclusion, with the TVC playing a major role. Interviews highlight that the implementation of the TVC could have exclusionary impacts due to its focus on mitigation. FSPs are not required to finance activities aligned with the TVC but are pressured to do so by funders such as multilateral organizations. As a result, the adaptation and resilience needs of vulnerable groups, including smallholder farmers and MSMEs, are not prioritized. SFC pilots confirmed that FSPs face challenges in applying the TVC to extend credit to these segments, including:

- Lack of alignment between the current focus on adaptation and the financing needs of vulnerable segments, many of which operate on a subsistence level. For instance, the immediate needs of microfinance institution (MFI) clients are often working capital and investment to sustain or grow their businesses, which are not prioritized in the taxonomy.
- Geographical, demographic and infrastructural barriers for FSPs to access the most vulnerable productive units in rural areas to perform verification and measurement tasks required by TVC implementation.

#### BOX 4. Climate-related regulation and financial exclusion in Colombia (Detail in Appendix 1) (continued)

- Lack of knowledge, by MSMEs and FSP branch staff, about green finance. For example, MSMEs and smallholder farmers often do not view transition activities as priorities due to their more pressing financial needs.
- Capacity constraints. Verifying environmental and social eligibility conditions set in the TVC and measuring the impact of the financed activities towards adaptation goals prove very difficult and costly, even when FSPs use alternative measurement methods (proxies) approved by SFC.
- Building capacity within FSP branch networks and agents to perform green verification and impact measurement tasks has proven to be a significant challenge, particularly in rural and remote areas.
- Lack of borrower compliance with environmental and other laws, partly due to informality, which affects over 50 percent of all Colombian workers. Since MSMEs fail to comply with laws such as environmental laws, their eligibility for green finance under the TVC is hampered.

for many EMDEs, like Colombia (see Box 4 and [Annex 1](#)), where, despite efforts to adjust assessment criteria and measurements metrics to the local context, FSPs still struggle to fit in climate adaptation and resilience of MSMEs and other vulnerable segments.

The EU taxonomy is being used by funders especially – but not exclusively – when channeling climate funds. One interviewee in Brazil reported that they have been compelled by investors to increase lending to wind parks, which ended up crowding out lending to MSMEs. Thus, projects that could be highly relevant for vulnerable groups may not be funded because they fail to fit the parameters of a taxonomy. Large FSPs with a diversified funding base may be able to attenuate the risk of losing access to funds, but smaller FSPs and development banks with longstanding relationships with international actors have less room to maneuver. This risk of reduced access to funding is not restricted to climate funds. International investors are gradually shifting portfolios towards green or sustainable activities, so the availability of funding not tagged as green or sustainable is likely to reduce.

Lastly, despite the need for green or sustainable finance taxonomies to be customized to the priorities and context of each jurisdiction, the proliferation of these taxonomies at the global level could increase transaction costs for international funders, which could impact FSPs in EMDEs. There is a tension between

the need for these taxonomies to closely reflect the particularities of each jurisdiction and the need for some mechanism of “translation” or “interoperability” between green or sustainable finance taxonomies to keep the cross-border transaction costs of international funders at bay (see World Bank 2024). This adds another layer of pressure on EMDEs to align with the EU, which is suboptimal for inclusive finance.

Transition plans may play a similar role, as argued by NGFS (2024): FSPs that must adhere to transition plan mandates in advanced economies might hesitate to invest in FSPs engaged in areas that lack robust data or are particularly susceptible to impacts of climate change. If the scope of transition plans does not adequately reflect the unique needs of EMDEs, there could be a detrimental impact on the funding of critical activities within these regions.

#### PATHWAY 4: CAPACITY CONSTRAINTS

The limited technical capacity of FSPs to understand vulnerable customers and to measure and monitor complex climate risks can result in overly conservative lending practices and constrain the development of product offerings that meet customer needs (World Bank 2024). FSPs –in both advanced economies and EMDEs– are still developing management capabilities for climate and other environmental risks, and testing approaches to implementing climate-related

regulations, more broadly. Many lack appropriate technology and new skills and expertise in the management of these risks. The examples below also illustrate the close relationship between client eligibility barriers (Pathway 1) and capacity constraints affecting FSPs and their customers.

Staff may also be resistant or inadequately trained to implement new procedures such as environmental due diligence or new project monitoring metrics. For example, studies in Brazil have described cases where bank staff, when considering loan applications by smallholder farmers whose proposals included a transition to sustainable farming, have rejected the proposal, partly because credit assessment criteria and portfolio monitoring procedures were not adapted to sustainable farming practices and staff had limited knowledge about such practices. Staff have also steered customers to take another loan type linked to traditional farming and compelled them to buy chemical inputs incompatible with sustainable farming. These reactions are also due to lack of understanding about the link between sustainable practices and climate, environmental and social risks that are already being managed at many FSPs in Brazil. Similar problems were highlighted in our interviews in Bangladesh, with respect to MSME finance.

To comply with portfolio management regulatory requirements, FSPs may use scoring models that set portfolio concentration limits by economic sector or geographies due to pre-determined climate risk ratings, which may lead to the exclusion of less profitable customers in those sectors or geographies (a clear link with Pathway 1). These models are more likely to be used by smaller and less sophisticated FSPs, some of which may be the main source of finance for vulnerable segments. In some cases, FSAs themselves encourage the use of simplified tools, such as in Bangladesh, where the central bank imposes the use of a checklist and a sustainability score methodology. In Brazil, there is growing use of scoring models developed by third-party vendors (including black box models that cannot be fully understood by FSPs) that use location-based

risk scoring. Regions classified with higher climate risk may concentrate large contingents of low-income communities. While there are ways of mitigating risk for certain types of lending, such as credit guarantees for rural credit, it is unclear whether scoring models are adjusted to take that into consideration. Also, capacity constraints at FSPs may lead to poor implementation of transition plans, which may reduce MSME access to financing for sustainability efforts, which would intensify social inequalities, lead to job losses, and threaten economic stability (NGFS, 2024).

Lastly, climate-related data are still underdeveloped in EMDEs, which impacts the ability of FSPs to identify, measure and manage climate and other environmental risks. Interviewees in Bangladesh, Colombia, and Brazil expressed concerns related to the availability of quality data and metrics on climate risks, including data that is produced by government agencies, organizations outside the financial sector, and clients themselves. NGFS (2021) and FSB (2021 and 2022) have drawn attention to the data challenges facing FSPs and financial supervisors. In Bangladesh, FSPs have highlighted that while they must report climate-related data and align with disclosure standards, their clients in the real sector have no such obligations and hence do not produce quality data.

In Brazil, where climate data produced by government authorities is well advanced, FSPs still highlight the challenges in collecting quality data from their clients and the issues caused by the low degree of comparability of climate risk metrics currently used across the financial sector. In Colombia, poor data may lead FSPs to be conservative and exclude riskier customers (see Box 3). The inability of borrowers to produce data on climate, environmental and social risks is closely related to access to funding in the context of taxonomy implementation (see Pathway 3). MSMEs, particularly women-owned microenterprises that often present lower capacity than male-owned enterprises, may be at higher risk of exclusion, despite being already severely underserved.

## **PATHWAY 5: INCREASED SUPERVISORY SCRUTINY**

New climate-related requirements may create uncertainty about the level and focus of supervisory scrutiny and related enforcement actions, which may lead to overcompliance. Overcompliance with new and complex regulatory requirements has been documented in other domains, such as anti-money laundering (de Koker and Symington, 2014; Jenik et al, 2024). FSPs, both large and small, may engage in overcompliance when regulation and supervision are

not yet fully developed or where the consequences of non-compliance are severe. For instance, the ECB has warned it will apply daily fines on banks failing to assess the materiality of climate and environmental risks across their portfolios (ECB 2024a). The risk of overcompliance has been raised in interviews in Colombia and has been observed in Brazil (see Box 5 and [Annex 1](#)), where the introduction of a requirement for large banks to add climate risks to their internal capital adequacy assessment process (ICAAP), in 2017, resulted in divestment from big polluters, which were later absorbed by smaller banks, crowding out MSMEs

### **BOX 5. Climate-related regulation and financial exclusion in Brazil (Detail in [Annex 1](#))**

**Brazil is the sixth largest global emitter of GHG<sup>a</sup> and emissions are predominantly from land use change and agriculture** (World Bank 2023).

According to IMF (2023), the effects of climate change are already impacting Brazil's economy, and World Bank (2023) estimates that extreme events have caused average annual output losses of 0.13 percent of GDP over the past 20 years. These trends can have an impact on the financial sector: around 20 percent of the total credit portfolio of the financial sector is exposed to climate-vulnerable sectors, with agriculture accounting for around 11 percent of total loans (IMF 2023).

**Agriculture is central to Brazil's sustainability agenda for being both a major contributor to climate change and to economic output.** It is key for climate change mitigation, adaptation and resilience. National policies promote sustainable agriculture, adaptation and resilience, including of smallholders which account for around 77 percent of rural properties in Brazil. The national rural credit policy, operated via the regulation and supervision of the Central Bank of Brazil (BCB, in its Portuguese acronym), is a key instrument for agricultural development and part to CBB's climate-related regulation. The regulation requires FSPs to allocate around 30 percent of deposit balances in rural credit, which has low interest rates thanks to government subsidies that apply inversely to the size of the

financed property. In particular, the National Program to Strengthen Family Agriculture (Pronaf) offers subsidies for improving family farming practices. BCB's rural credit regulation reinforces some rules set in environmental laws such as the Forest Code. Another key initiative of the policy is Proagro, an agricultural credit guarantee scheme overseen by the BCB.

**Two infrastructure elements support BCB in the implementation of the rural credit regulation: the Rural Environmental Registry (CAR) and SICOR.** The Forest Code requires a CAR for all rural properties, irrespectively of size. CAR contains rich details about each property and its owners. SICOR is a BCB database with details of all rural credit operations where each loan is tagged to a CAR. The CAR works as an identification number which is then used to integrate SICOR to other databases that also use CAR, such as those of environmental agencies and ministries of justice, and labor. With this integration, BCB runs automated compliance checks against a wealth of information for each property financed by rural credit. In 2021 these automated checks were expanded and the BCB created the Green Credit Bureau, a service akin to a credit bureau, but focused on climate, environmental and social risks, which FSPs use to support compliance with climate, environmental and social risks related to rural credit.

**The BCB's approach to climate-related regulation has been to gradually integrate environmental and social risks, and later climate risk, into regulation and supervision.** The first requirements for rural credit underwriting were set in 2008. Between 2008 and 2024, FSPs were gradually required to:

- i) in 2010, exclude from credit provision individuals or legal entities listed in the Register of Employers who have maintained workers in conditions analogous to slavery (**credit underwriting requirement**).
- ii) In 2014, design and implement a Social and Environmental Responsibility Policy – PRSA (**broad risk management obligations**).
- iii) In 2017, include socio-environmental risk into their risk and capital management frameworks (**broad risk management obligations**).
- iv) In 2019, require CAR for all rural credit operations (**credit underwriting requirement**).
- v) In 2021, exclude from rural credit provision properties with a canceled/suspended CAR (**credit underwriting requirement**).
- vi) In 2021, incorporate climate and environmental risks into their risk and capital management frameworks, with the PRSA being replaced by the Social, Environmental, and Climate Responsibility Policy – PRSAC. FSPs must identify, measure, evaluate, monitor, control, report and mitigate climate, environmental and social risks, which includes monitoring of exposure concentrations in sectors or regions more vulnerable to these risks, conduct climate scenario analysis and stress testing, and analyze the impacts of these risks over traditional financial risks. FSPs must annually disclose risks and opportunities in a report called GRSAC Report, with qualitative disclosures aligned with the recommendations of the Task-Force on Climate-Related Financial Disclosures (TCFD) (**broad risk management obligations and requirements on stress testing and scenario analysis**).

- vii) In 2023, exclude from rural credit provision properties with a CAR containing embargoed areas, and areas that overlap with public forests across all biomes in Brazil (**credit underwriting requirement**).
- viii) The BCB is currently consulting on regulation to implement IFRS S1 and S2 (**disclosure requirements**).

BCB has built specialized regulatory and supervisory teams for both rural credit and the other aspects of its encompassing climate-related regulation.

**Additionally, Brazil's Sustainable Taxonomy is being drafted in an effort led by the Ministry of Finance**, and its assessment criteria and measurement indicators were put forward for public consultation in November 2024 (Ministério da Fazenda 2024). The taxonomy ought to impact the financial sector and will interact with BCB's climate-related regulation. Key features of this taxonomy include the inclusion of land use activities such as crop production and forestry, and activities that promote social and racial equality. The taxonomy will come into force in 2026, but it is not clear whether it could impact financial inclusion, as its details are still being defined.

**Evidence shows that the rural credit regulation has played a role in reducing deforestation in the Amazon biome and improving the lives of farmers** (e.g. by increasing family income and productivity), overall contributing to greater resilience of local communities. CAR and SICOR are key for these results, as they allow the BCB and FSPs to run checks against borrowers to improve compliance with legal and regulatory requirements. The benefits may extend to increased protection of vulnerable communities such as indigenous groups against land-grabbing and environmental violations. The availability of quality data has also allowed the BCB to gradually improve incentives for sustainable farming, based on a borrower's compliance with environmental laws and those who are taking measures to become compliant. In addition, the Green Credit Bureau and other available databases of environmental agencies help FSPs adhere to sustainable finance standards, more broadly.

BOX 5. **Climate-related regulation and financial exclusion in Brazil** (Detail in [Annex 1](#)) (continued)

**However, the rural credit regulation seems to also have some financial exclusion impact due to wider context issues.** Rural credit to smallholder farmers has been decreasing over the years. Currently, it is estimated that 85 percent of small rural properties have no access<sup>b</sup> to credit and that this number is even higher in poorer regions. While large farmers are increasing participation in subsidized rural credit, the number of new small borrowers has fallen 47.8 percent from in 2019/2020 to 2023/2024 and the fall of especially acute (54 percent) in the Northeast region, where the most vulnerable subsistence farmers are located. The decline coincides with the BCB requirement for borrowers to produce a CAR to access rural credit, from 2019 onwards. While the most vulnerable farmers may struggle to produce a CAR, for example due to illiteracy or lack of internet access – research<sup>c</sup> shows that other factors explain lower access to rural credit, such as being a female, non-white, old, or with a lower level of education, and not having access to the internet and electricity. The challenges are even starker for Pronaf programs, due to challenges such as additional bureaucracy and documentation requirements for some programs, such as organic certification, which increases the cost for both farmers and FSPs. Farmers are also challenged by a lack of technical assistance and guarantees, both of which are often required by FSPs, which may see the loans to family farmers as riskier than other agricultural loans. Finally, lack of understanding, by both FSP staff and smallholder farmers about Pronaf programs is also a major barrier for access to rural credit.

a <https://edgar.jrc.ec.europa.eu/>

b Agroicone estimates based on SICOR data and total number of small rural properties in Brazil.

c These evidence points result from an extensive literature review conducted by Agricone for CGAP, in July 2024.

Except for rural credit regulation, there is limited evidence of the impacts of the climate-related regulation. However, our interviews suggest that the risk of financial exclusion is real. A 2017 study found that a regulatory requirement for large FSPs to incorporate climate, environmental and social risks into risk management and capital frameworks led smaller banks to reduce lending to small and medium enterprises (SMEs) and also reduced SME employment (Liriano et al 2023). Interviews with FSPs highlighted concerns with higher compliance costs that could render small-value loans unattractive, although concrete actions in this regard have not been reported. The risk of requiring additional information from low-income borrowers and MSMEs (e.g. for FSPs to meet new disclosure standards) was emphasized. Another concern is the risk of tightening credit conditions for whole sectors due to the influence of the EU taxonomy and simplistic sustainability measurement methods, such as for GHG emissions, which could lead to knock-on effects in productive value chains upon which many vulnerable segments depend; or reduced credit for activities crucial to climate mitigation, adaptation, and resilience building in Brazil, but that do not align with EU priorities. Finally, the interviews also highlighted the developing state of expertise in climate and environmental risk management; the risk of increased supervisory scrutiny and the increased risk of reputation and litigation from increased disclosures, which could lead FSPs to be more conservative.

(Liriano et al 2022).<sup>17</sup>Also, internationally active European FSPs must ensure that all non-EU operations comply with EU regulations, including the EU taxonomy. When facing uncertainty, FSPs may engage in overcompliance

to avoid being questioned by EU supervisors. For instance, when deciding upon loans to activities that contribute to climate resilience and adaptation in EMDEs but do not squarely fit the EU taxonomy.

17 The Central Bank of Kenya also issued, in 2021, supervisory expectations for banks to include CRFR into their ICAAP (Guidance on Climate-related Risk Management), but the impacts have not yet been measured.

## **PATHWAY 6: INCREASED REPUTATION AND LITIGATION RISK**

New regulatory requirements can change FSP's perception of and exposure to reputation and litigation risks associated with lending to certain customer segments, sectors, or geographies, which can lead to retrenchment. Litigation risk arises in the face of legal embroilment, and reputation risk arises from accusations of greenwashing or other types of public accusation that do not necessarily involve litigation. While litigation could lead to potentially high costs to settle disputes, activist action against FSPs on the grounds of climate concerns about financed activities could lead to reputational damage and lost businesses or funding. These risks increase with greater disclosure of FSP practices to manage climate and other environmental risks, as well as their climate commitments. These disclosures are often required by climate-related regulations. Based on data from the Climate Change Laws of the World database, Setzer and Higham (2021) observed that the global number of climate change-related legal cases more than doubled between 2015 and 2021. NGFS (2023 and 2024) confirmed the upward trend in climate- and nature-related litigation specifically in the financial sector.

These risks could lead to conservatism that excludes vulnerable segments, particularly when their activities are grey areas of green or sustainable finance taxonomies or their properties are near the boundaries of legally protected areas, or within areas exposed to heightened public scrutiny (see Brazil example below). In this sense, there is a link between this pathway and customer eligibility (Pathway 1) and funding (Pathway 3). In the interviews, some FSPs raised concerns about reputational and litigation risks, even regarding seemingly uncontroversial elements. For instance, in Brazil, the requirement (under consultation) by the central bank to segment the disclosure of the banking loan portfolio by the type of biomes (Amazon, Cerrado, Mata Atlântica, Caatinga, Pampa, and Pantanal) has caused concerns for FSPs. The concern is due to the high level of scrutiny by civil society and funders related to rampant deforestation and crimes regarding land conflicts in some biomes.

# Minimizing Exclusion Risks: Emerging Recommendations

**T**O REAP THE STABILITY, SAFETY AND soundness benefits of climate-related regulation while minimizing exclusionary risks, FSAs must focus their attention on vulnerable segments and consider how the broader country context may impact regulatory implementation. As discussed in the previous section, some financial exclusion effects from these regulations could relate to weaknesses or limitations found outside the financial sector, including weak enforcement of environmental laws (which may lead to conservatism by FSPs faced with poor data about vulnerable groups), costly or inefficient business licensing, or land registration practices, and poor availability of data produced by non-financial authorities.

In EMDEs, FSAs can, and some already do, use regulatory, supervisory, and other tools to better coordinate the objectives of financial stability and inclusion, while supporting the climate agenda. Additionally, a holistic approach is needed to fuel a virtuous cycle between these policy goals, as not all can be achieved via regulatory and supervisory measures. EMDEs must adopt multiple initiatives, and, in addition to FSAs, other actors, including government authorities, SSBs and international organizations, should play a role.

## Ensuring proportionality in regulatory and supervisory action

FSAs should be mindful of the challenges FSPs face in achieving compliance when serving the most

vulnerable. FSAs must fully embrace a proportional approach (risk- and principles-based, consultative and gradual) to the design and supervision of climate-related regulations, fully consistent with international standards and guidance, including BCBS (2022a and 2022c). Such an approach would be sensitive to the different risks, levels of complexity and business models across FSPs serving vulnerable groups, which will help FSAs balance the various objectives pursued by regulation. For instance, broader, principles-based risk management obligations in relation to climate and other environmental risks would give more flexibility to FSPs to serve a range of customer segments, than the imposition of detailed, one-size-fits-all requirements placed on organizational structures, credit underwriting requirements, and prudential ratios.

At the same time, FSAs may consider measures such as special regulatory treatment to vulnerable segments, which could be temporary and/or focused on FSPs specialized in serving these segments. Greater flexibility could help FSPs to continue serving them, including clients who are on their way towards complying with climate-related regulations or with other relevant rules, such as rural property certification required by environmental laws. FSPs may successfully comply with broad risk management obligations in different ways, and the microfinance industry provides a proven track record of serving informal businesses and low-income clients based on little documentation.

Regulatory measures that could be considered include minimum transaction thresholds and exemptions based on customer attributes. For instance, Bangladesh Bank has exempted small loans to individuals and MSMEs from some credit underwriting requirements such as environmental due diligence. The Peruvian Financial Superintendence has exempted FSPs from applying all social and environmental risk management requirements based on several loan thresholds. In Brazil, some requirements can be temporarily lifted for some rural loan types, to allow financing of farmers who are taking steps to become compliant or to transition to sustainable farming practices. Also, FSAs could consider how different methods of borrower or sector exposure limits could lead to the exclusion of vulnerable groups. For instance, limits based on the borrower's capital or assets may have a greater exclusion potential than limits set as a percentage of the FSP's portfolio.

These specific regulatory measures have not been fully tested yet and due care is warranted to avoid jeopardizing safety and soundness and stability objectives. Vulnerable customers usually do not amount to a significant portion of assets in the financial system, but may be highly relevant for some individual FSPs, such as MFIs and lenders specialized in MSME finance. In considering proportional approaches to climate-related regulations, particularly to prudential requirements that may eventually be added to climate-related regulations, FSAs in EMDEs may consider applying the recommendations of BCBS (2022c), including segmentation approaches and metrics, definition of capital, calculation of risk-weighted assets, approaches to large exposures, content and level of disaggregation and details of disclosure requirements, and the application of proportionality for the supervisory review process.

Green or sustainable finance taxonomies must be dynamic, forward-looking (Demekas and Grippa, 2021) and tailored to each country's institutional, social and economic context. Well-designed taxonomies can go a long way in helping EMDEs boost inclusive finance for climate adaptation and resilience, ensuring

that vulnerable segments are not left behind. Among others, this requires that the measurement approaches foreseen in the taxonomy cater to small operations and vulnerable clients. This could involve using localized data and metrics that capture diverse environmental and social impacts, incorporating participatory approaches to gather input from local communities, and developing simplified and flexible measurement methods to accommodate varying levels of capacity. Alternatives like targeted exemptions and transition arrangements should also be explored.

A similar approach is needed for transition planning requirements. NGFS (2024) emphasizes that transition plans must be adapted to the specific circumstances of different sectors and economies, particularly in EMDEs, and should follow a holistic approach that addresses both physical and transition risks, considering both mitigation and adaptation challenges. Finally, transition plans must be tailored to the distinct challenges faced by EMDEs, such as higher vulnerability to climate risks and weaknesses in infrastructure, regulatory capacity, and business environment, and lower emission levels compared to advanced economies.

Overall, a consultative and phased approach to design and implement climate related regulation would provide FSPs with the necessary time to develop technical capacity and plan for gradually increasing compliance costs in an organized manner. For instance, new risk management requirements could be implemented over multiple years through a phased approach that includes establishing the foundation, increasing understanding and action, and progressing toward full integration as suggested by the World Bank (2024). In Brazil and Colombia, FSAs have conducted extensive consultations with FSPs before introducing climate-related regulations. In Colombia, the regulatory evolution has transitioned gradually from non-binding guidance to an increasing number of binding requirements (see [Annex 1](#)). Additionally, inter-departmental coordination at Colombia's Financial Superintendence helps the authority identify potential financial inclusion implications of climate-related regulations.

Finally, sound technical supervisory knowledge and expertise are fundamental for a proportional approach to supervision. The supervisory cycle can influence FSP responses to climate-related regulation, and should be consistent with a risk-based approach. Sensitizing supervisors and FSPs is crucial for preventing suboptimal strategies resulting from overcompliance. Climate-related regulations are complex and relatively new, creating uncertainty that may lead to overly conservative approaches by both FSPs and supervisors, especially in EMDEs, where FSPs may operate under more challenging conditions compared to developed economies. FSPs may impose additional requirements that are not explicit in the regulation, and these could have exclusionary effects. FSAs should enhance their internal capacity on climate and other environmental risks and educate supervisors about the potential exclusion effects of regulation, emphasizing the need to identify and address overcompliance practices. FSAs must clarify supervisory expectations by issuing statements and actively engaging with the industry. Finally, climate adaptation should be duly embedded into regulatory and supervisory practices, including by using specific metrics for measurement and disclosure of adaptation (NGFS 2024a). Effective supervisory oversight and engagement will encourage FSPs to improve their technical capacity in the management of climate and other environmental risks, and their ability to address those risks and opportunities that are more specific to vulnerable groups.

## Adopting a holistic approach

EMDEs should adopt a holistic approach in their response to climate change, incorporating complementary strategies alongside the regulatory and supervisory action discussed above, seeking to maximize synergies across policy goals and

strategic priorities.<sup>18</sup> As noted by Demekas and Grippa (2021) and the World Bank (2024), climate-related regulation cannot substitute for interventions to support vulnerable groups. EMDEs must ensure that their climate agendas prioritize adaptation and resilience (World Bank, 2024) and adopt a variety of interventions, including market support tools, tailored responses to climate shocks, and tools to promote climate finance. This is particularly important considering that the risk of financial exclusion is heightened in EMDEs due to longstanding weaknesses within the financial sector as well as external factors like high exposure to physical risk, high informality rates, and weak law enforcement. These shortcomings not only exacerbate the exclusionary potential of regulations but also limit the effectiveness of tools to promote climate finance (see below). Prioritizing improvements in the enabling environment (Carvajal and Didier Brandão 2024) is essential.

## MARKET SUPPORT TOOLS

Market support tools can help FSPs implement climate-related regulations more effectively, helping attenuate pathways such as customer eligibility barriers, increased costs, and capacity constraints. For instance, reforms to increase efficiency of traditional market infrastructures such as credit and movable collateral information are considered particularly helpful to support women's climate resilience and financial inclusion (World Bank 2023c). Properly designed credit guarantee and insurance schemes, with safeguards against moral hazard (World Bank 2022), are important for all lenders, but are crucial for FSPs with limited capacity and striving to serve vulnerable segments.

For instance, FSPs need new data for effective management of climate and other environmental risks. Although much of this data is generated outside the

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<sup>18</sup> Countries like Armenia, Fiji, Jordan, Morocco, the Philippines, Rwanda, and Tanzania, for instance, have already aligned their financial inclusion and climate agendas. SBFN (2024) shows that 24 countries (out of 66) reported setting expectations to enhance access to finance for low-income households, small businesses, and vulnerable groups, focusing on supporting climate change adaptation and/or resilience. Two-thirds of these countries have incorporated this topic into broader sustainable finance frameworks.

## BOX 6. Climate-related regulation and financial exclusion in Bangladesh (Detail in Appendix 1)

Bangladesh, contributing only 0.48 percent to global emissions, is highly vulnerable to climate change, facing frequent natural disasters like cyclones, floods, and droughts. Ranked 168th in climate readiness, it needs significant improvements to adapt, with over 13 million people potentially displaced by 2050. Key strategies include: i) Bangladesh Delta Plan 2100, a 100-year plan for sustainable resource management; Mujib Climate Prosperity Plan 2022-2041, focused on resilience and stability for vulnerable communities and industries; and iii) National Adaptation Plan 2023-2025, a climate-resilient development plan which urges financial reforms. The financial sector plays a crucial role in advancing climate resilience, especially for low-income households and small enterprises. However, access to financial products like savings, insurance, and credit remains limited, hindering recovery from climate impacts. Bangladesh Bank, the central bank, promotes inclusive climate finance to address these challenges.

Bangladesh Bank has been addressing environmental risks since 2011 and climate and social risks since 2017. Additionally, it ranks FSPs based on a sustainability rating system covering sustainable finance, corporate social responsibility, green refinance, core banking sustainability, and banking services. It has established a classification system for sustainable products and set disclosure requirements, in regulation. Key regulatory actions include:

- 2011 Environmental Risk Management (ERM) Guidelines: introduced environmental risk integration into credit risk management with due diligence checklists and environmental ratings, as well as disclosure requirements (**broad risk management requirements, credit underwriting and portfolio management requirements, and disclosure requirements**).
- 2011 Policy Guidelines for Green Banking (GBP): issued in 2011 and expanded between 2013 and 2017, classifying 55 activities as green (**green taxonomy, product standards**).
- 2017 Guidelines on Environmental and Social Risk Management (ESRM): expanded ERM requirements

to include social and climate risks, incorporating an excel based Environmental and Social Due Diligence (ESDD), a generic checklist for measuring the associated environmental and social risks including climate risks (**broad risk management requirements, credit underwriting and portfolio management requirements**).

- 2020 Sustainable Finance Policy (SFP): the policy includes a Sustainable Finance Taxonomy along with a country perspective Green Taxonomy and Climate Finance Taxonomy. The policy incorporates a list of 94 green product/projects/initiatives under 14 sectors. Updated in 2023 to include a gender lens and guide climate finance identification (**green taxonomy, product standards**).
- 2023 ESRM Update: updated ESDD check list specific for 10 sectors and introduced third-party impact assessments for infrastructure projects (**credit underwriting and portfolio management requirements**).
- 2023 IFRS S1 and S2 Adoption: IFRS new standards adopted in December 2023, to be fully implemented by 2027, enhancing financial disclosures of FSPs (**disclosure requirements**).

Bangladesh Bank has set minimum lending targets for green (5 percent) and sustainable (40 percent) finance of all loan disbursements and investments of FSPs. It also requires FSPs to form a Climate Risk Fund, allocating at least 10 percent of their Corporate and Social Responsibility (CSR) budget to it. To boost sustainable finance, Bangladesh Bank uses promotional tools like targeted refinancing operations (TROs) with concessional rates, to help FSPs meet the lending targets. These include the Revolving Refinance Scheme, which encourages green lending, covering 70 environmentally friendly products, projects or initiatives by 2022, and the Green Transformation Fund, which was initially for textile, leather, and jute sectors, now expanded to all export-oriented industries. Banks can partner with MFIs to allocate these funds, ensuring compliance with regulatory requirements, including environmental due diligence.

## BOX 6. Climate-related regulation and financial exclusion in Bangladesh (Detail in Appendix 1) (continued)

Despite Bangladesh Bank's efforts and focus on financial inclusion, there are concerns about increasing exclusion risks for low-income segments and CMSMEs. Challenges in regulatory implementation could worsen financial exclusion. The ratio of green finance to total bank advances has consistently been below the minimum target, ranging from 1.6 to 2.8 percent (2013-2016) and 0.7 to 1.7 percent (2019-2023). CMSME finance increased over 200 percent between 2021-2023, but it only accounted for 5 percent of total green finance in 2023. There is also a problem of geographic concentration, with sustainable and green finance disbursements concentrated in urban areas like Dhaka and Chittagong.

Some customers face challenges meeting eligibility and information requirements for green and sustainable loans, particularly due to the costs and complexity involved. Key issues include:

- **ESDD checklist:** Many CMSMEs lack the green certifications and business licenses needed to meet these requirements.
- **Additional reporting:** Post-loan approval reporting requirements add costs, making small loans less viable even with subsidies.
- **Focus on large enterprises:** The sustainable finance taxonomy prioritizes climate mitigation activities, favoring large enterprises and projects, potentially crowding out finance for CMSMEs and low-income groups.

FSPs face significant costs in implementing regulatory requirements, which can discourage smaller, less

profitable loans. Disclosure and reporting costs are important, since preparing and submitting reports is time-consuming, especially for small transactions with CMSMEs and low-income households. Some banks have already adapted their processes and infrastructure to meet Bangladesh Bank's disclosure standards, but these changes come with cost implications. A phased implementation of IFRS S1 and S2 will help in this regard, potentially easing the cost and technical capacity challenges of FSPs.

Exclusion risks are influenced not only by climate-related regulations but also by broader country context issues. First, MFIs, which serve vulnerable segments, cannot access Bangladesh Bank's refinancing lines. Although banks can allocate funds via MFIs, they cannot verify eligibility and creditworthiness due to lack of borrower information (MFIs do not report to the credit registry). These and other challenges in verifying information of low-income populations and CMSMEs lead to a low level of usage of the subsidies available for FSPs to extend credit to these segments. Lastly, CMSMEs often lack business licenses and face practical challenges and costs to obtain such licenses. This makes them ineligible for environmental certificates and, consequently, credit aligned with the sustainable finance taxonomy. Other challenges include capacity constraints, evolving expertise at FSPs, and limited borrower knowledge. FSPs may lack sufficient understanding of green and sustainable finance, particularly for low-income segments and CMSMEs. Likewise, low-income segments, especially in rural areas, have limited awareness of sustainable or green finance opportunities.

financial sector, FSAs can facilitate access to it.<sup>19</sup> For example, the Central Bank of Brazil manages SICOR, a system that records rural credit operations and links to property registration and other databases, including some environmental agencies. This integration allows

comprehensive checks of environmental issues such as protected areas, deforestation and embargoes against each property. This data also allows the publication, by the central bank, of detailed rural credit data. Additionally, the Green Credit Bureau, established by

<sup>19</sup> FSB (2022) highlights the importance of establishing public data repositories at national, regional or global levels for various forms of climate-related data as one means to increase the efficiency and quality of data collection and risk management by financial institutions.

the central bank in 2021 based on SICOR data, allows a range of additional checks of sustainability issues. The bureau is accessible by FSPs, based on borrower consent, potentially improving rural credit provision.

Well-designed risk-sharing facilities can also support lending to vulnerable groups, particularly those most affected by climate risks. Globally, there is substantial experience with mechanisms like credit guarantees and insurance facilities. Carvajal and Didier Brandão (2024) make the case for EMDEs to capitalize on tools such as partial credit guarantees to promote small and medium enterprise (SME) finance, and recently, more jurisdictions have established similar initiatives to promote sustainable lending while reducing risks for FSPs.<sup>20</sup> In Nigeria, climate risk insurance is combined with subsidized lending and credit guarantees, with the Central Bank of Nigeria covering 50 percent of FSP losses if a smallholder farmer defaults. Armenia's central bank has a public-private partnership for agricultural climate insurance subsidizing 50-60 percent of insurance costs through the Agricultural Insurers' National Agency (AINA). In Morocco, the insurance supervisor offers a "climate multi-risk" product to protect major cereal crops from climate-related damage. Brazil's Proagro agro-insurance program, is another example. It requires compliance with agroecological zonings to ensure that climate-damage can be accurately captured and measured according to the season and location of crops. Management of credit and insurance risks is further supported by the agricultural climate-risk zoning data published by agricultural authorities (MAPA 2021).

## **TAILORED RESPONSES TO CLIMATE SHOCKS**

FSA should develop specific regulatory and policy responses to climate-related shocks to enhance resilience and support lending during crises, similar

to actions taken during the COVID-19 pandemic, with a focus on support to vulnerable groups. FSAs can design pre-emptive, responsive and post-event measures to provide temporary relief to FSPs and borrowers through guarantees, credit forbearance, or direct lending (Feyen et al, 2020b). Recommendations from the IMF and the WBG for COVID-19 responses could be applied to the climate crisis (IMF and World Bank 2020) such as leveraging existing regulatory flexibility while minimizing moral hazard, facilitating public and private support, and adjusting supervisory triggers while protecting financial stability. Proactively announcing regulatory preparedness can increase certainty for FSPs and borrowers, supporting lending to vulnerable groups. Examples of such responses include relief measures in Bangladesh, Peru, and the Philippines, after natural disasters (World Bank 2024), and Brazil's actions following the 2024 floods in Rio Grande do Sul.<sup>21</sup> In designing such tools, it's crucial to mainstream gender and promote intersectionality to address the significant gender gaps in access to climate and disaster risk finance and insurance – CDRFI (World Bank 2023c).

## **Tools to promote climate finance**

EMDEs are implementing a mix of tools to promote inclusive climate finance but the results have been mixed due to design flaws, operational challenges, and broader country context issues (see examples of policy tools in [Annex 5](#)). Long-used tools like credit allocation, pricing policies and central bank tools like TROs have had varying success, while newer tools aim to support climate finance in the context of national climate commitments. TROs are central bank loans to banks at favorable conditions to stimulate lending to MSMEs, for instance. These are used in countries like Bangladesh, Egypt, Nepal, and Pakistan, and credit allocation tools

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20 The following examples are cited to illustrate the increasing adoption of these tools, rather than being an endorsement of their effectiveness.

21 The Central Bank of Brazil issued rules to make the classification of credit operations restructured in the wake of the floods more flexible; exempt from reserve requirements, for one year, FSPs with more than 10 percent of their loan portfolios held by individuals or enterprises located in the state of Rio Grande do Sul; and allow remote-based audits for the payout of insurance claims within the government's agro-insurance program Proagro (Exame 2024).

such as minimum lending targets in countries like Bangladesh, Brazil, India, Nepal, and Fiji. The jury is still out on the suitability and effectiveness of many of these tools (World Bank 2024) and Carvajal and Didier Brandão (2024) provide some recommendations to improve policy tools to promote SME finance in the context of climate change.

Bangladesh, for instance, combines TROs, lending targets, interest rate caps, and regulatory exemptions for vulnerable groups. Still, our interviews indicate that the results have not been optimal (see [Annex 1](#)) due to challenges such as inefficiencies in the operation of the TROs, high MSME informality, and inefficiencies in business licensing and credit data. Similarly, smallholder farmers in Brazil face challenges in registering their rural properties, obtaining technical assistance, and increasing knowledge about the financing options.<sup>22</sup>

## International guidance and support

SSBs and other international organizations such as the NGFS, World Bank and the IMF, could incorporate financial inclusion considerations in their work on climate-related regulation and supervision more systematically. They can do this by paying special attention to the uneven regulatory impacts on EMDEs. These organizations will have a key role, for instance, in developing methods to make the green or sustainable finance taxonomies compatible across jurisdictions to fund activities that benefit vulnerable groups in EMDEs.<sup>23</sup> SSBs could provide further guidance on proportionate regulatory and supervisory approaches specifically with regard to prudential requirements that already exist or may be added to climate-related

regulations, taking the specific challenges faced by EMDEs into account.

Other international organizations such as the World Bank and the IMF can help FSAs and FSPs design climate-related regulations, proportional supervisory approaches, green or sustainable finance taxonomies, and specific guidance for FSPs to design climate transition plans that are tailored to the EMDE context.<sup>24</sup> Finally, these organizations could also provide support for FSAs in EMDEs to conduct regulatory impact assessments to identify and measure the outcomes of climate-related regulations (and possibly broader related policy actions).

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22 Compilation of literature conducted by Agroicone, commissioned by CGAP.

23 SBFN provides a toolkit to help FSAs design and implement taxonomies adapted to local contexts while following good international practice (SBFN 2024). UNEP (2023) is an example of an attempt to harmonize taxonomies in a region (Latin America and the Caribbean). The ASEAN Taxonomy for Sustainable Finance is a similar effort (ASEAN 20224). However, it is early days to conclude whether this approach is optimum in ensuring inclusive climate finance in EMDEs.

24 For instance, SBFN has launched a Task Force on Inclusive Sustainable Finance in 2024, with focus on helping EMDEs design and implement sustainable finance frameworks—including climate-related regulations—that foster inclusivity.

# Areas for Further Research

**C**ONSIDERING THE POTENTIAL magnitude of the exclusion risks of introducing climate-related regulations in EMDEs, further research will be crucial to understand this issue better, helping make it a priority for FSAs in EMDEs, SSBs, and other international organizations. Further research could focus on:

- **Measuring exclusion impacts via the pathways proposed in this paper, for credit provision and beyond.** It is crucial to build more robust empirical evidence of financial exclusion effects using the pathways framework, and potentially, expanding the scope of impact research to other financial services, including insurance.<sup>25</sup> The research should also social risks and nature-related financial risks, as these are increasingly being integrated in climate-related regulatory frameworks. Research should focus on vulnerable groups such as low-income segments, smallholder farmers, and MSMEs, and pay particular attention to the greater challenges faced by women in a climate change context (Notta and Zetterli 2023). Finally, research should use both supply-side and demand-side methods to better understand how regulatory reforms affect these segments.
- **Specific prudential and non-prudential regulatory adjustments and proportionate supervisory approaches to foster inclusive finance while implementing climate-related regulations.** For

example, accounting rules that penalize high capital expenses or long-term operations (which may be associated with climate finance) could have negative impacts on MSMEs. The feasibility and prudential implications of regulatory adjustments such as thresholds, exemptions, and transitional arrangements, including those mentioned in the previous section, should be specifically investigated. Also, research should be conducted on effective mechanisms to apply proportionality in supervision in this field (e.g. assessing risk materiality, governance arrangements, lending policies, and business models).

- **How to leverage technology to support the implementation of climate-related regulations and promote resilience and adaptation via innovative financial products and services.** CGAP has long been studying the potential of innovation for inclusive finance, but specific research on the intersection between innovation by FSPs and inclusive climate finance, particularly when FSPs need to implement climate-related regulations, is needed. For instance, experimentation is needed to test innovative solutions (e.g. inclusive scoring models and other risk modeling, and the use of high and ultra-high-resolution satellite imagery to check compliance and monitor financed activities in remote areas) for FSPs to identify and manage climate and other environmental risks in EMDE

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<sup>25</sup> Insurance regulation increasingly incorporates climate-related issues. For instance, in the EU the Solvency II Directive was amended in 2024 to include sustainability issues, and the European Insurance and Occupational Pensions Authority (EIOPA) has recommended a dedicated prudential treatment (with additional capital requirement), for insurers' fossil fuel assets (EIOPA 2024). IAIS recently put for consultation its climate risk supervisory guidance, proposing adjustments to the core principles for effective insurance supervision to consider climate-related issues.

contexts. Especially in areas where there are high levels of MSME informality, poor climate and environmental data, deficient land and property registries, and customers who are highly exposed to physical risks. Solutions to enhance data while empowering vulnerable groups to generate data could also be explored.

In addition to the above research priorities, complementary research could be conducted on the following topics to further foster inclusive and responsible finance:

- **Consumer protection issues arising from increasing green/sustainable financial products.** OECD (2023) explores challenges and opportunities for financial consumers related to green/sustainable finance. The G20/OECD Task Force on Financial Consumer Protection has added this topic as a cross-cutting theme of the High-level Principles for Financial Consumer Protection, highlighting the need for FSAs to utilize market monitoring tools and strengthen transparency to help consumers understand green/sustainable finance products, including to counter the risk of greenwashing. This Task Force is also developing a tool to collect evidence on consumer knowledge, attitudes, preferences, and behaviors related to green/sustainable products. Further evidence is needed to understand the risks consumers face when FSPs implement climate-related regulations, such as potential discrimination due to the use of climate-adjusted credit scoring or push for products that do not meet the financial needs of consumers.
- **Effectiveness of and alternatives to existing tools to promote climate finance.** Tools such as TROs, minimum lending targets and price limits could impact the incentives for FSPs to serve vulnerable groups in EMDEs, while failing to achieve their stated goals. They could also be shifting attention and resources away from workable solutions. Their effectiveness and potentially adverse impacts should be explored and, if needed, alternative approaches should be explored. For instance, FSAs could collaborate with the private sector and

fundors to facilitate the development of innovative green/sustainable finance instruments, following a triple-bottom-line approach, via mechanisms such as industry challenges. The role of blended finance and private funds should also be explored.

Like their peers in advanced economies, FSAs in EMDEs are adopting climate-related regulations to preserve stability, keep FSPs safe and sound, and support the global climate agenda. While the potential benefits of these reforms are apparent, the risk of deepening financial exclusion is more difficult to identify and there is little hard evidence to date. However, these negative effects could be very relevant for EMDEs, where broader context weaknesses impact regulatory implementation. The six impact pathways presented in this paper provide a structured analytical framework for FSAs in EMDEs to examine whether and how these regulations could disproportionately affect access to credit among vulnerable groups.

To mitigate the exclusion risk while not jeopardizing other policy objectives, FSAs in EMDEs can adjust their regulatory and supervisory action to better cater to the needs of vulnerable groups, informed by the pathways analysis. Moreover, action by FSAs must be complemented by other authorities in EMDEs, in a holistic approach encompassing improvements in market support tools, responses to climate shocks, and tools to promote climate finance. To support these efforts, more research should focus on further documenting the regulatory impact in EMDEs, exploring proportionate and specific regulatory and supervisory approaches to counter exclusionary effects, and experimenting with technological solutions that could be applied by FSPs to implement climate-related regulations while supporting inclusive finance in the context of climate change.

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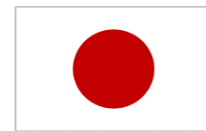
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# CGAP Members



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