

# **WORKING**

# CLIMATE RISK AND FINANCIAL INCLUSION: A REGULATORY PERSPECTIVE ON RISKS AND OPPORTUNITIES

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### Abstract

1

Climate change, environmental degradation, and financial exclusion are closely interlinked. This working paper provides a conceptual framework that outlines how climate change and environmental degradation increase risk for the real economy. It explains how this heightened risk may drive a retrenchment of the financial sector away from the least profitable and the most exposed segments of the economy: namely low-income, rural households, and Micro, Small, and Medium Enterprises (MSMEs). It also shows how new reporting and disclosure requirements for increased climate environmental due diligence can have unintended consequences, exacerbating financial exclusion if they are not implemented with a risk-based approach. Conversely, it shows how carefully articulated green finance regulations and policies can enhance financial stability by creating a more resilient real economy and thereby reducing the risks facing the financial sector.<sup>1</sup>

The paper draws from the literature in economics, recent work from global standard setting bodies, and interviews with prudential supervisors in over a dozen Emerging Markets and Developing Economies (EMDE) to draw the contours of a potentially vicious cycle of ever-increasing financial sector retrenchment, financial exclusion, vulnerability, and climate injustice. It also identifies a virtuous cycle, whereby policy actions taken by financial sector authorities can counteract climate risk-driven financial sector retrenchment, increasing the chances of vulnerable segments to access the financial sector that is both more stable and more sustainable. In this way, ambitious green financial sector policies that thoughtfully incorporate financial inclusion can lay the foundations for a more just transition and stable financial system.<sup>2</sup>

<sup>1</sup> In the debate on green finance and greening of the financial system, the definition of what "green" means in practice is often both vague and varied. In designing and implementing policy and regulation, distinguishing between different aspects of "green" is a challenging but crucial task. See Annex 1 for a short discussion.

<sup>2</sup> For a broader discussion on the link between financial inclusion and financial stability, see e.g. CGAP and GPFI (2011), CGAP (2012), World Bank (2016), CGAP (2018).

## What is the link between climate change, financial inclusion, and financial stability?

**Climate change and environmental degradation can affect financial inclusion in three major ways, with implications for financial stability.** This section will outline how (1) physical risk, and (2) transition risk, alter the expected risk-adjusted returns for financial institutions in ways that may lead to a retrenchment of the financial sector away from the most climate exposed sectors of the economy. It will also outline how (3) policy actions such as green reporting and disclosure requirements can, if not implemented in a risk-proportional manner, have unintended consequences that exacerbate financial exclusion. All three causal pathways could contribute to a vicious cycle whereby financial exclusion of vulnerable sectors feeds back into higher exposure of the real economy to climate-related and environmental risk, thus further increasing financial sector exposure to economic shocks (see Figure 1). On the other hand, inclusive green financial regulation and policy could create a virtuous cycle, driving a just transition to a sustainable economy and more resilient financial system.

**Physical risk may drive a retrenchment of the financial sector away from the most climate-exposed sectors of the economy**. Extreme weather events such as droughts and floods as well as slow-onset trends such as desertification have material effects on the real economy. They cause losses to productive capital and infrastructure, disrupt businesses, and increase replacement and rebuilding costs. Excessive heat is known to reduce labor productivity.<sup>3</sup> Moreover, the output of businesses that rely on ecosystem services such as freshwater (irrigation) and pollination is likely to shrink due to climate change and environmental degradation.<sup>4</sup> These effects are compounded by the limits on adaptation responses placed on the poor by lack of education, information, and resources.

These effects of physical risk on the real economy are transmitted to the financial system.<sup>5</sup> <sup>6</sup> If financial institutions witness evidence of increased credit risk from businesses and households affected by physical risks, one of the potential reactions from the financial sector is to reduce their exposure to the borrowers in question. Low-margin customers in sectors of the economy that are particularly exposed to physical risk would likely be the first to suffer from such financial sector retrenchment.<sup>78</sup> Since low-income households and MSMEs are typically more likely to

- 3 Custodio, C., Ferreira, M., Garcia-Appendini, E. and Lam, A (2022). "How Does Climate Change Affect Firm Sales? Identifying Supply Effects." Available at SSRN: https://ssrn.com/abstract=3724940 or http://dx.doi. org/10.2139/ssrn.3724940
- 4 IPBES and IPCC (2021). Biodiversity and Climate Change: Workshop Report. URL: https://ipbes.net/sites/ default/files/2021-06/20210609\_workshop\_report\_embargo\_3pm\_CEST\_10\_june\_0.pdf
- 5 NGFS. (2018). First Progress Report. https://www.ngfs.net/sites/default/files/medias/documents/818366-ngfsfirst-progress-report-20181011.pdf
- 6 BCBS. (2021). "Climate-related risk drivers and their transmission channels." https://www.bis.org/bcbs/publ/ d517.htm
- 7 Hallegatte, S. (2016). "Shock waves: managing the impacts of climate change on poverty." World Bank Publications.
- 8 The Financial Superintendency of Colombia (SFC) assessment found that some Colombian banks are about two to three times more vulnerable to flood hazards than most others because of high exposures in more rural areas. See World Bank (2021). "Not-So-Magical Realism: A Climate Stress Test of the Colombian Banking System." https://openknowledge.worldbank.org/handle/10986/36586

live and work in sectors and geographical areas exposed to the effects of climate change, not least agriculture, any exclusionary effects will disproportionately impact the poor.<sup>9</sup>

**Transition risk may also lead to financial sector retrenchment.** Necessary changes in climate and environmental policies, technology, consumer preferences, and investor sentiment in response to climate change may have material repercussions for the real economy. This holds especially true for households and businesses that rely on fossil fuels and other sources of greenhouse gas emissions, for example in transport and livestock farming sectors. Moreover, the fast pace of innovation and shift toward green technology means that some business investments in older technology will not pay off, leading to losses and stranded assets.<sup>10</sup> Faced with heightened credit, liquidity, and market risk that derives from such transition risk, as well as reputational imperatives to stop supporting polluting sectors. The magnitude of that incentive will depend partly on shifts in consumer preferences and partly on the policy and regulatory environment under which they operate.

This turn away from high-emission and polluting sectors and production methods is welcome. But it is well known that low-income households and MSMEs face greater difficulties than larger firms in mobilizing financing, including for investments in low-carbon and environmentally sustainable technologies.<sup>11</sup> If transition finance is not available for these sectors of the economy, there is a risk that only large and well-capitalized firms will be able to switch to green technology while production by MSMEs, smallholder farmers, and other low-income segments grows increasingly obsolete and unviable. Without appropriate policy measures in place, this would raise concerns about worsening inequality <sup>12</sup> and driving an unjust transition to a low-carbon economy.<sup>13</sup>

While regulatory action is needed to mitigate the climate and environmental risk facing financial institutions, it should be carefully designed to minimize unintended exclusionary effects. Financial supervisors at the Network for Greening the Financial System (NGFS), the Basel Committee on Banking Supervision (BCBS), and elsewhere, are assembling a growing list of supervisory practices and standards to safeguard the financial system against rising physical and transition risk. Such guidance focuses on how financial institutions can enhance climate-related and environmental risk management, but only indirectly and partially

- 9 The disproportionate exposure, vulnerability, and impact of climate risk on the poor is well established. See for example IPCC (2022). Climate Change 2022: "Impacts, Adaptation, and Vulnerability." Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.
- 10 Carney, Mark. (2015). "Breaking the tragedy of the horizon–climate change and financial stability." *Speech given at Lloyd's of London* 29, 220-230. Caldecott, B. (2017). "Introduction to special issue: stranded assets and the environment." *Journal of Sustainable Finance & Investment*, 7(1), 1-13.
- 11 Owen, R., Brennan, G., & Lyon, F. (2018). "Enabling investment for the transition to a low carbon economy: Government policy to finance early stage green innovation." *Current opinion in environmental sustainability*, *31*, 137-145.
- 12 Chancel, Lucas, Philipp Bothe, and Tancrede Voituriez. *Climate Inequality Report 2023*. 2023. https://wid. world/wp-content/uploads/2023/01/CBV2023-ClimateInequalityReport-1.pdf.
- 13 Wågsæther, K., Remme, D., Haarstad, H., & Sareen, S. (2022). "The justice pitfalls of a sustainable transport transition." *Environment and Planning F*, 1(2-4), 187-206.

addresses financial inclusion concerns.<sup>14</sup> Moreover, because regulatory actions to address climate-related risk have only recently been implemented, knowledge about unintended consequences of such policies is thin on the ground.

For example, the transaction costs associated with environmental due diligence, approval and certification, monitoring and verification, may be disproportionately high for smaller projects and businesses.<sup>15</sup> Similarly, the introduction of differential capital adequacy requirements for loans with different environmental classifications may reduce the availability of transition finance for climate exposed parts of the economy. Likewise, a "Brown Penalizing Factor" may result in the exclusion of the least profitable clients without green credentials.<sup>16</sup> The implications can also play out through more indirect knock-on effects that are difficult to predict. For instance, a recent empirical study shows that Brazil's proportional incorporation of climate risk into the risk management process in 2017 did not change the greenhouse gas emissions of large firms in polluting sectors. Smaller banks, who were exempt from the new regulations, filled the credit gap as the largest financial institutions retreated. Because their lendable capital is limited, this shift of smaller banks to larger customers led to a reduction in credit availability, firm size, and employment among small firms, their traditional clients.<sup>17</sup>

To be clear, climate and nature risk management and reporting for financial institutions is of utmost importance for financial stability and sustainable economic growth in the future. These, and similar interventions by regulators, could benefit clients in the long-term if they strengthen incentives for investment in climate adaptation. However, they could also exacerbate financial exclusion, with negative implications for economic resilience and financial stability. Inclusive regulations can balance these considerations, and ensure that reporting and disclosure requirements do not raise transaction costs to a point where serving low-margin customers such as MSMEs and rural households becomes less profitable or unprofitable.<sup>18</sup>

The flip side of environmental due diligence by financial institutions are green credentials provided by their clients. Firms may need to certify that their production methods satisfy sustainability requirements in order to be eligible for preferential green financing. Again, while the cost of green certification may be insignificant for large firms, it might represent an insurmountable barrier to financing for MSMEs and smallholder farmers. Inclusive green finance<sup>19</sup> policies and regulations thus seek to avoid the financial exclusion of sectors of the economy that cannot afford to provide green credentials.<sup>20</sup>

- 14 BCBS. (2022a). Principles for the effective management and supervision of climate-related financial risks. https://www.bis.org/bcbs/publ/d532.htm. BCBS. (2022b). Frequently asked questions on climate-related financial risks. https://www.bis.org/bcbs/publ/d543.htm
- 15 Mundaca T, L., Mansoz, M., Neij, L., & Timilsina, G. R. (2013). "Transaction costs analysis of low-carbon technologies." *Climate Policy*, 13(4), 490-513.
- 16 Both a "Brown Penalizing Factor" and a "Green Supporting Factor" have been considered by regulators such as the European Banking Authority. See for instance EBA (2022). *On the role of environmental risk in the prudential framework*. Discussion paper EBA/DP/2022/02.
- 17 See: Miguel, F., Pedraza, A., & Ruiz Ortega, C. (2022). *Climate Change Regulations: Bank Lending and Real Effects* (World Bank Policy Research Working Paper No. 10270). World Bank Group.
- 18 Coggan, A., Whitten, S. M., & Bennett, J. (2010). Influences of transaction costs in environmental policy. *Ecological economics*, 69(9), 1777-1784. Michaelowa, A., Stronzik, M., Eckermann, F., & Hunt, A. (2003). Transaction costs of the Kyoto Mechanisms. *Climate policy*, 3(3), 261-278.
- 19 AFI (2017). Sharm El Sheikh Accord: Financial Inclusion, Climate Change and Green Finance.
- 20 Brunner, S., & Enting, K. (2014). Climate finance: A transaction cost perspective on the structure of state-tostate transfers. *Global Environmental Change*, 27, 138-143.





Sources: NGFS<sup>21</sup>, BCBS<sup>22</sup>, author's additions in orange (CGAP)

# What are the implications for financial sector policy, regulation, and supervision?

The nexus between climate risk, financial instability, and financial exclusion can generate a vicious cycle of spiraling vulnerability. As the previous paragraphs have outlined, physical risk, transition risk, and the unintended consequences of *non-inclusive* 

22 BCBS. (2021). Climate-related risk drivers and their transmission channels. https://www.bis.org/bcbs/publ/ d517.htm

<sup>21</sup> NGFS. (2019). A call for action: Climate change as a source of financial risk. https://www.ngfs.net/en/firstcomprehensive-report-call-action

climate policies and regulations can lead to a retrenchment of the financial sector, potentially undoing years of financial inclusion gains, with negative repercussions for financial stability. Financially excluded sectors of the economy are less likely to access the financial services necessary to adapt, invest in green technology, and build up their resilience to climate and environmental shocks. This in turn threatens to exacerbate the vulnerability of the real economy, which will have knock-on effects on financial stability. The vicious cycle completes when financial institutions adjust to the growing vulnerability of the economy by retrenching further, discontinuing services to more climate-exposed clients. Considering this transmission channel, even supervisors exclusively concerned with financial stability have reasons to pay attention to financial inclusion.<sup>23</sup>

On the other hand, inclusive climate regulation and policy can drive a virtuous cycle of growing inclusion, resilience, and stability. If economic actors at the margins of the financial system can also afford the services necessary to insure themselves against shocks, invest in green technology, and adapt to climate change and environmental degradation, both they and any parts of the wider economy they interact with will be more resilient. For example, if farmers can invest in more resilient crops and irrigation technology or start new business endeavors in areas where farming becomes unviable, their incomes and hence consumption of goods and services from other economic actors will be preserved rather than decline.<sup>24</sup> If MSMEs in the transport sector can use transition financing to reduce their dependency on gasoline and diesel and thus become more resilient to price shocks as fossil fuel subsidies are being phased out, then people and businesses that depend on their transport services will not face disruptions or higher costs due to transition risk.<sup>25</sup> Crucially, clients that are more resilient to climate-related and environmental shocks pose lower credit, market, and liquidity risk for the financial institutions that serve them. In addition to increased resilience, access to green finance and technologies can also enhance the competitiveness of firms, and improve access to new markets.

Hence, carefully articulated green finance regulations and policies can help a larger part of the economy manage climate shocks and stresses. A more resilient real economy in turn reduces the risks facing the financial sector, enhancing financial stability. Because this means higher risk-adjusted returns for financial institutions, inclusive green regulations and policies align with the incentives of market participants.<sup>26</sup> They contribute to Nationally Defined Contributions under the Paris Agreement and support a just transition by generating more widespread political support for the change to a low-carbon and sustainable economy (see Figure 2).

<sup>23</sup> Coelho, R. and F. Restoy (2023). "Macroprudential policies for addressing climate related financial risks: challenges and trade offs." *FSI Briefs No. 18*.

<sup>24</sup> Suri, T., & Jack, W. (2016). "The long-run poverty and gender impacts of mobile money." *Science*, 354(6317), 1288-1292.

<sup>25</sup> Wimbadi, R. W., Djalante, R., & Mori, A. (2021). "Urban experiments with public transport for low carbon mobility transitions in cities: A systematic literature review (1990–2020)." *Sustainable Cities and Society*, *72*, 103023.

<sup>26</sup> Benjamin Franklin sold fire insurance to owners of houses he equipped with the lightning rod he invented in 1752. Similarly, the providers of drought-resistant crops, a modern-day risk-reducing technology, may have a commercial incentive to provide crop insurance because the technology lowers expected underwriting losses.



### FIGURE 2. The virtuous cycle of green resilience and supporting policies

7

### Financial sector authorities and governments must work together to set this

**virtuous cycle in motion.** Several policy tools are available to address physical and transition risk drivers of financial sector retrenchment.<sup>27</sup> Existing policies and instruments for financial inclusion can be "greened," that is, adjusted to focus on climate-related and environmental risk, and green policy tools can be made inclusive, by deliberately minimizing unwanted exclusionary effects. Regulation can also be drafted to take information costs, capacity constraints, and potential knock-on effects into account.<sup>28</sup> In addition, policymakers can take advantage of technological progress to address market failures and reduce transaction costs using digital technology.<sup>29</sup>

Even though this is a relatively new area which merits careful policy design and implementation, the relative scarcity of data and experience should not be an excuse for inaction, or for

<sup>27</sup> Monasterolo, Irene, Mandel, Antoine, Battiston, Stefano, Mazzocchetti, Andrea, Oppermann, Klaus, Coony, Jonathan, Stretton, Stephen, Stewart, Fiona, Dunz, Nepomuk. 2022. *The Role of Green Financial Sector Initiatives in the Low-Carbon Transition: A Theory of Change*. Policy Research Working Papers;10181. World Bank, Washington, DC. https://openknowledge.worldbank.org/handle/10986/38028

<sup>28</sup> Volz, U. &Knaack, P. (2023). Inclusive green finance: A new agenda for central banks and financial supervisors. INSPIRE Sustainable Central Banking Toolbox Briefing 12.

<sup>29</sup> Arner, D. W., Buckley, R. P., Zetzsche, D. A., & Veidt, R. (2020). Sustainability, FinTech and financial inclusion. European Business Organization Law Review, 21, 7-35. Knaack, P. (2022). Leveraging Digital Financial Services to Advance Inclusive Green Finance Policies. Alliance for Financial Inclusion. URL: https://www.afiglobal.org/publications/leveraging-digital-financial-services-to-advance-inclusive-green-finance-policies/

implementing new rules that ignore these concerns. Evidence on the magnitude of these concerns is still limited, since these developments have not yet had time to play out in most markets. But the transmission channels themselves are clear and well understood—and the implications follow in a fairly straightforward manner. Hence the prudent approach is to explicitly consider the potential risk of unintended exclusionary effects when developing new rules and guidance for the financial sector. Given the considerable momentum and sense of urgency around responding to climate change, the risk of overlooking these concerns is elevated without such deliberate efforts.

### What are the contours of a policy response?

The available range of financial sector policy responses that are both green and inclusive can be captured in three broad categories: policy instruments for mitigating climate risk; reducing transaction costs linked to climate risk management and green financing; and scaling up affordable green finance (see Figure 3). It should be noted that some of these interventions come with their own costs and risks that need to be considered.

The first policy action to consider involves adjusting existing risk mitigation instruments for green purposes, or designing new ones. Providing financial services to MSMEs and the agricultural sector has always entailed significant risk. Financial authorities have devised a range of instruments to cover some of that risk, incentivizing financial institutions to offer services to these sectors. Such instruments can be re-designed to address climate-related and environmental risk. Loan guarantee schemes, for example, can prioritize climate-vulnerable businesses and projects.<sup>30</sup> Public-private partnerships in agricultural insurance can be adjusted to deal with changes in physical risk. Promoting development of climate insurance products that would fit the needs of different sectors beyond agriculture is also an important effort that should be an integral part of a broader insurance market development frameworks.

**The second action is to make green finance more widely available and affordable.** Several policy tools are available in this regard. Monetary policy authorities can develop targeted refinancing operations at preferential interest rates, that reward banks for lending to vulnerable sectors.<sup>31</sup> Where such targeted monetary policy tools are already in place, for example, to mobilize financing for MSMEs, they can be adjusted for green purposes. In addition, making transition funds available for MSMEs in polluting sectors of the economy can help address both transition risk and financial exclusion.

Development finance institutions can provide green financing lines in a similar fashion. In addition to providing funding at preferential rates and longer tenors that match climate investment horizons, they can provide grants for technical experts to train both local financial institutions and end-borrowers. Such capacity training can reduce transaction costs, helping

<sup>30</sup> Calice, P. (2021). Greening public credit guarantee schemes for net zero. World Bank Blog. https://blogs. worldbank.org/psd/greening-public-credit-guarantee-schemes-net-zero

<sup>31</sup> Colesanti Senni, C. and Monnin, P (2021). Aligning central bank refinancing operations with the G20 agenda. Zurich: Council on Economic Policies. URL: https://www.cepweb.org/aligning-central-bank-refinancingoperations-with-the-g20-agenda/





local financial institutions with the identification of eligible projects.<sup>32</sup> It can also help them to develop their own due diligence and monitoring capabilities, as well as marketing and communication materials that stimulate demand for inclusive green loans among existing and new clients in the future.<sup>33</sup>

The third type of policy action is to reduce the transaction costs generated by climate-related and environmental regulation, including information costs. Obtaining information on exposure to physical and transition risk is essential to safeguard the financial system, but it is costly. A proportional approach that merely distinguishes between large and small financial institutions might be counter-productive, as the latter may face greater climate risks in their portfolio than the former and thus need more, not less climate-related information.<sup>34</sup> Instead, a risk-based approach can distinguish between large and small loan sizes. The clients of each financial institution differ significantly in their ability to absorb the cost of environmental due diligence. Financial sector authorities can keep their focus on material

34 See, for example, the climate risk assessment of the Colombian banking sector, footnote 8.

<sup>32</sup> The European Bank for Reconstruction and Development (EBRD) pays environmental consultants to help its client's banks assess potential borrowers against green criteria, building capacity and building a green project database in the process.

<sup>33</sup> Shishlov, Igor, Till Bajohr, Mariana Deheza, and Ian Cochran (2017). Using Credit Lines to Foster Green Lending: Opportunities and Challenges. Institute for Climate Economics.

risk, while reducing the regulatory burden on smaller and less sophisticated borrowers. They can do this by making risk management and reporting requirements proportional to loan size.<sup>35</sup> Capacity building measures should complement these efforts. Financial authorities can also consider building a green finance database, where MSMEs or smallholder farmers can obtain their green credentials at no or low cost. Such a database then would be accessible to all financial institutions seeking to offer green or transition loans, thus reducing information asymmetry. Financial authorities in Brazil<sup>36</sup> and China<sup>37</sup> have already taken noteworthy steps forward in this area.

**Expanding the availability of digital financial services can be one important way to reduce transaction costs and increase access to necessary services.** Digital finance provides fast and affordable risk mitigation tools. Mobile money, for example, allows people affected by extreme weather events to receive emergency funds from friends and family, constituting an informal insurance network.<sup>38</sup> Digital payments can also provide low-cost rails for government-to-person payments in the wake of disasters, agricultural index insurance, and asset financing for solar panels and other green technologies. Furthermore, in many jurisdictions where women are less likely to have collateral, data-based digital lenders may offer responsible financial access that narrows the gender gap.<sup>39</sup> Financial regulators cannot generate demand for such services. But in providing an enabling regulatory environment for digital financial services, they can foster market entry, competition and innovation that ultimately improve the supply of financial services, that can enhance the climate resilience of people and businesses.

- 35 Bangladesh Bank, for example, requires extensive economic and social risk management only for loans above a certain de minimis threshold. See Bangladesh Bank (2017), Guidelines on Environmental & Social Risk Management (ESRM) for Banks and Financial Institutions in Bangladesh. URL: https://www.bb.org.bd/ aboutus/regulationguideline/esrm\_guideline\_feb2017.pdf The Egyptian and Peruvian supervisory authorities require independent environmental assessments only for projects above a certain loan size.
- 36 Guardado, F. (2022). *Sustainable Finance: From Pledges to Progress*. Banco Central do Brasil. https:// aprendervalor.bcb.gov.br/conteudo/home-ptbr/TextosApresentacoes/FG\_GIZ\_20.10.22.pdf
- 37 Wu, M. (2022). "Problems and Countermeasures in the Implementation of Green Finance Standardization-Taking Huzhou Green Finance Experimental Zone as an Example." *Frontiers in Economics and Management*, 3(1), 71-78.
- 38 Riley, E. (2018). "Mobile money and risk sharing against village shocks." *Journal of Development Economics*, 135, 43-58.
- 39 This is not a given. Without a policy environment that fosters women's responsible access to digital credit, the gender gap may remain stable or even widen. See: Johnen, C., & Mußhoff, O. (2023). "Digital credit and the gender gap in financial inclusion: Empirical evidence from Kenya." *Journal of International Development*, 35(2), 272–295.

### The challenge ahead

**Financial supervisors, the government, and international partners must work together to mobilize inclusive green finance.** Financial stability is ultimately about ensuring that the financial system is able to meet the needs of its clients. This means that supervisors need to strike the right balance between traditional stability concerns and the ability of the sector to serve all clients with relevant services. Achieving that goal will require thoughtful and sometimes difficult choices that balance competing demands. We have outlined several categories of potential actions that can be taken to reduce the risk of a vicious cycle, and bolster the chances of a virtuous one. However, deciding on, developing, and implementing these policy actions may not be a trivial undertaking. Even thoughtfully crafted rules and initiatives can fail or misfire if implemented poorly, or in contradiction with the efforts of other stakeholders.

Domestic authorities need to make a concerted effort to connect and synchronize the inclusive aspects of a green finance strategy and the green aspects of a financial inclusion strategy. This requires cooperation between the central bank, the finance ministry, line ministries with responsibility over agriculture and transport, and specialized development finance institutions, such as agricultural development banks, and many others. International partners can play a meaningful role in funding inclusive green finance tools and in providing capacity building for the private sector and public authorities.

In a world beset by the risk of climate change and an unjust transition, financial supervisors cannot afford to stand on the sidelines. Carefully crafted, green finance policies and regulations that take inclusion into account, can play a material role by setting in motion the virtuous cycles of greater inclusion, resilience, and financial stability.

### **Annex | Definitions**

### PHYSICAL RISK

Physical risk from climate change and environmental degradation refers to changes in both weather and climate that impact economies. This includes acute physical risks (rapid-onset shocks) such as floods and severe rainfall, extreme heatwaves, wildfires, and storms as well as chronic physical risks (slow-onset stresses) such as rising sea levels, rising average temperatures, and ocean acidification.<sup>40</sup>

### TRANSITION RISK

Transition risk from climate change and environmental degradation refers to changes in consumer preferences, policies and regulations, production technologies, etc. that are a necessary part of the transition to greener economies but may also have material repercussions for the real economy. These may include higher costs of compliance with new rules, waning demand for certain products and services, losses on investments in outdated technologies ("stranded assets"), etc.<sup>41</sup>

### **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.







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