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The role of central banks in supporting
green structural transformation in the least
developed countries

CHAPTER 4

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A. Introduction

The financial system is increasingly in the spotlight as a crucial complementary player in global efforts to reduce carbon emissions by virtue of its role in financing both carbon-emitting activities and the decarbonization of economies. Concern is growing that global investment behaviour continues to significantly finance carbon-emitting production and its further expansion. Voluntary adherence by businesses to environmental, social and governance (ESG) principles and adoption of corporate social investment (CSI) are proving inadequate or inefficient catalysts and drivers of decarbonization.¹ Since the 26th Conference of the Parties (COP26) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2022, momentum is growing to make the alignment of global financial flows to net-zero commitments at the national level mandatory. Indeed, the timing and severity of the consequences of climate change depend increasingly on the rapidity and effectiveness of policies supporting countries' transitions to low-carbon economies. Crucially, COP27 estimated that a global transition will require investments of at least \$4–6 trillion per year, which signifies that delivering such funding will require a transformation of the financial system and its structures and processes.² That recognition is in line with Article 2.i.c of the 2015 Paris Agreement, which set out the goal of “making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development” (hereafter referred to as financial alignment).

The Sustainable Development Goals and the Paris Agreement together represented the tipping point in 2015 of the sustainability movement. Since then, there has been growing interest in incorporating ESG considerations into investment decisions. The latest push by the UNFCCC to set the goal of climate neutrality, whereby net zero greenhouse gas (GHG) emissions are achieved “by balancing those emissions so they are equal (or less than) the emissions that

¹ Environmental, social and governance (ESG) investing is a strategy used by corporates and investors to convey to their consumers, stakeholders and employees how they manage related risks and opportunities. ESG focuses on accountability. Adherents typically employ ESG principles or standards to screen their investments. Corporate social investment (CSI) is a strategy that directs investment towards a company's social mission with the view to fostering sustainability and development, ranging from community development to caring for the environment. Such financial commitments are typically more than just charitable donations.

² See <https://unfccc.int/documents/624444>.

How the new role for central banks might evolve in LDCs is not yet well understood

get removed through the planet's natural absorption”, has added renewed impetus to financial alignment.³

This chapter focuses on the possible role of central banks of least developed countries (LDCs) in realizing a just transition in their countries through conventional climate central banking, given their dual priority goals of contributing towards a low-carbon transition and green structural transformation for sustainable development. How the new role for central banks might evolve in LDCs and what impact it will have on their structural transformation through the changes it induces in the allocative decisions of financial intermediaries, is not yet well understood. This is because there is very little literature focusing on developing economies, and in particular LDCs, where empirical research is especially constrained due to paucity of data. This chapter attempts to unpack some of the related issues to shed light on possible answers to these two fundamental questions.

B. Climate-related financial risk

1. Classification of climate-related risk

Globally, climate central banking represents largely uncharted territory for all central banks (UNEP, 2017). Effective climate central banking⁴ is dependent on the development of robust methodologies and collection of comprehensive data for evaluating the climate-related risks to which companies and investors are exposed. This includes models that enable a forward-looking assessment of climate-related risks, and their social and macroeconomic repercussions, which are indispensable for charting just transitions and resolving time-dependent trade-offs. Such methodologies are currently lacking (Campiglio et al., 2018; Kyriakopoulou et al., 2022). Peer learning

³ See <https://unfccc.int/blog/a-beginner-s-guide-to-climate-neutrality#:~:text=Climate%20neutrality%20refers%20to%20the,our%20emissions%20through%20climate%20action.>

⁴ This chapter uses the term climate central banking to capture the totality of measures taken by central banks to address climate change effects in the financial system, which the wider literature may alternatively refer to as green central banking, sustainable central banking or net-zero central banking.

and exchange of good practices is thus one of the favoured vehicles for developing climate central banking expertise and knowhow. This is being undertaken through, for example the Network of Central Banks and Supervisors for Greening the Financial System (NGFS).⁵ LDC members of the NGFS include Cambodia, Rwanda, Uganda, United Republic of Tanzania and the eight⁶ LDC affiliates of the Central Bank of West African States. However, in many countries, especially in the LDCs, the scarcity of skilled professionals in sustainable finance remains a major challenge. Membership of peer and learning networks is thus not indicative of the ability to implement climate central banking and, unsurprisingly, progress on climate central banking is proceeding at different speeds around the world.⁷ Moreover, globally, the financial architecture for climate central banking is still in the making, with specific disclosure, assessment and governance

tools under development or requiring refinement, including in terms of combating greenwashing.

The NGFS (see box 4.1) has undertaken work to deepen understanding of climate-related risk and emerging issues and draw on lessons learnt so far. It identifies two classes of climate-related risk: (i) physical risks of a temporal nature and (ii) transition risks (figure 4.1). Economies and productive actors are exposed to acute physical effects of climate change related to extreme weather events, such as violent storms, or chronic physical effects associated with gradual shifts in climate, such as extreme temperatures, that have knock-on negative effects on crop yields (BIS, 2021).⁸

Physical effects can have a lasting impact on a country's gross domestic product (GDP), because they can cause long-term loss of production and divert capital earmarked for investment in reconstruction and replacement. Physical risks are expected to rise as climate hazards increase in frequency and

Box 4.1 The Network of Central Banks and Supervisors for Greening the Financial System

The NGFS, established in 2017, is not the only network promoting climate central banking, but it has emerged as a prominent driver of the evolving policy landscape for climate central banking, leading the definition and promotion of best practices and analytical work on central banks' climate actions. While its membership is voluntary, its ambition is to promote the implementation of its frameworks globally. According to the NGFS website, as at the end of 2022, the membership of the NGFS covered all global systemically important banks and 80 per cent of internationally active insurance groups, and by June 2023, it had 127 members, spanning 85 countries.

Similar initiatives at the regional level have emerged. For example, the Climate and Financial Risk Center (CFRCenter) for Latin America and the Caribbean – the second most disaster-prone region globally after Asia and the Pacific – has been set up in collaboration with the Association of Central Banks of Latin America and the Caribbean (CEMLA), the Association of Supervisors of Banks of the Americas (ASBA) and the Latin American Association of Insurance Supervisors (ASSAL), together with the United Nations Environment Programme (UNEP). Like the NGFS, the CFRCenter aims to promote open discussion, build capacity, and share knowledge and experiences on identifying, assessing, disclosing and managing climate-related financial risks in Latin America and the Caribbean. It is the first regional hub initiative to coordinate regional central banks and supervisors.

Given the diversity of existing central bank operational frameworks, the NGFS membership recognizes that achieving optimal climate-related adjustments is necessarily context specific, and thus not amenable to prescriptive approaches. It also makes assessing different climate-related adjustments to monetary policy operations difficult (NGFS, 2021). The emergence of regional initiatives is indicative of the substantial variation in vulnerability of economies and ecosystems to climate change among and within regions. Overall, developing countries face greater physical risks, including more frequent climate change-related severe weather events. Therefore central banks and financial systems in those countries are potentially more exposed to climate-related risks and thus may have more at stake in climate central banking. Accordingly, they have a strong incentive to join the global adaptation effort.

⁵ <https://www.ngfs.net/en>.

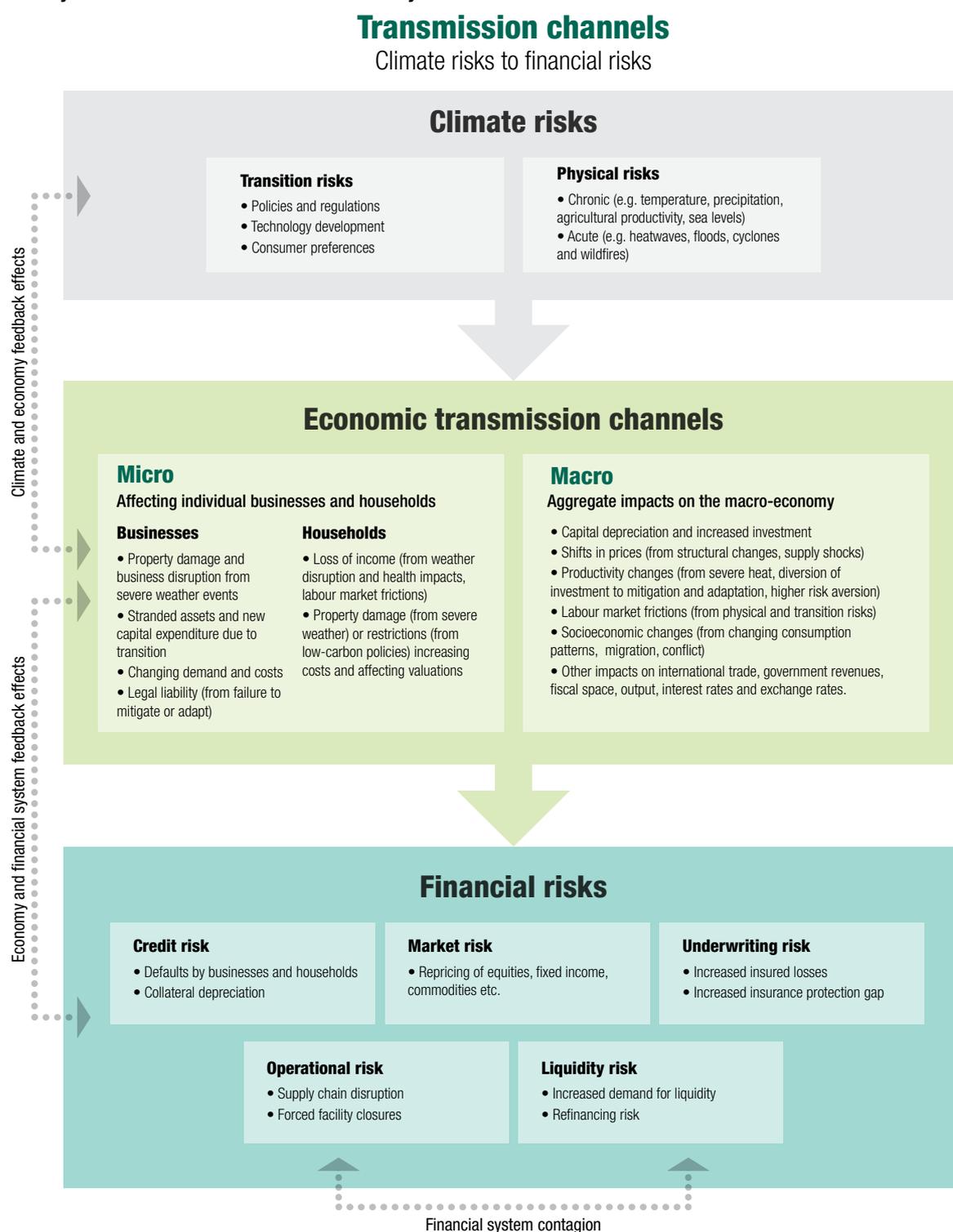
⁶ Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, the Niger, Senegal and Togo.

⁷ An NGFS survey of 40 central banks in 2020 found that only 10 per cent were applying the recommendations on disclosures by the Task Force on Climate-Related Financial Disclosures (TCFD) – underlining differences across central banks' rates of implementation – and that membership of bodies such as the NGFS does not necessarily signal implementation of climate central banking (NGFS, 2020a).

⁸ Acute physical risks are generally considered to consist of lethal heatwaves, floods, wildfires and storms (including hurricanes, cyclones and typhoons), as well as extreme precipitation. Chronic physical risks are generally considered to include rising sea levels, rising average temperatures and ocean acidification.

Figure 4.1

Taxonomy of climate-related risks to financial stability



Source: NGFS, 2022.

intensity (ECB, 2021). With the intensification of decarbonization, economies and productive actors face potential losses resulting from changes in policy, technology and behaviour in domestic and/or export markets. Such climate-related impacts will have

rebound effects on the financial system, with the greater likelihood of shocks that disrupt the financial system.

Physical risks are assumed to be transmitted to the financial system through both macroeconomic

LDCs are particularly vulnerable to climate-related physical effects

and microeconomic impacts, including impacts on businesses, households, governments and financial institutions.⁹ LDCs are particularly vulnerable to climate-related physical effects. Their economies are highly dependent on climate-vulnerable sectors, such as agriculture, forestry and fisheries. They also lack the financial capacity to recover quickly from climatic events. Climate change can thus lead to lower economic growth, higher unemployment and higher inflation. It can also lead to climate-induced capital outflows, which can increase the cost of borrowing both for the public and private sectors (Beirne et al., 2021; Kling et al., 2021), and cause exchange rate devaluations or depreciations.

Since financial sector intermediaries play a vital role in financing productive sectors, they are exposed to firms' transition risks via defaults on loans. They are similarly exposed through changes in firms' asset values stemming from physical losses from climate impacts or from technological innovations in response to climate change or environmental regulations. Transition effects can also be expected to originate from domestic actions in LDCs. For example, the introduction of mitigation policies, such as carbon taxation, could lead to inflation and a reduction in employment in carbon-intensive sectors, with significant distributional effects (UNCTAD, 2019a; 2022a). However, climate mitigation policies can also have some beneficial economic effects for those LDCs that export the kinds of metals and minerals necessary for green investments, even though there is a risk that they might at the same time enhance "green extractivism" (i.e. more intensive resource and labour exploitation).¹⁰

Physical and transition risks are sometimes referred to as horizontal risks, as they are present across the four core bank risks: credit risk, market risk, liquidity risk and operational risk (Kearns, 2021).

⁹ Beyond the financial sector, knock-on effects on credit intermediation, on which households and businesses rely to maintain normal operations, are predicted to have an adverse impact on economic activity, employment and growth in an economy.

¹⁰ For an analysis of green extractivism, see Voskoboynik and Andreucci, 2022, and UNCTAD, 2022a.

2. Approaches to financial alignment

a. Risk-based approach: safeguarding financial stability

It has become a generally accepted view that climate change matters for monetary policy, and that central banks are important actors in managing risks to the financial system. It is also generally acknowledged that central banks can ensure that the financial system supports efforts to meet the temperature goals of the Paris Agreement as well as efforts towards achieving a just global transition to a low-carbon economy. This has resulted in the emergence of a conventional approach to climate central banking based on central banks' unique position to enact financial policies and to supervise and enforce financial regulations. This approach departs from the standpoint of preserving systemic financial stability (i.e. the stability of banks, insurance firms and other financial actors) by de-risking financial systems, and thus generating positive economy-wide spillovers in the direction of a low-carbon transition.

In a number of economies, central banks already take defensive and reactive actions to incorporate climate-related risks into their risk frameworks aimed at protecting their own balance sheets and preserving their ability to deliver on price stability mandates. Such risk management may include measures to de-risk their own international foreign reserves that may be exposed to both physical and transition risks associated with climate change. Central banks may also expand and enhance their analytical toolkits to gain a better understanding of the impacts of climate change on the economy over the long term. In addition, they raise awareness of climate risks through communications with financial institutions, disclosing the carbon footprint of their own balance sheets and promoting disclosure of climate-related financial risks by other financial market players, including through active membership of networks such as the NGFS, the UNEP Finance Initiative (UNEP FI), the International Finance Corporation's Sustainable Banking and Finance Network (SBFN) and the Net-Zero Coalition under the auspices of the United Nations.¹¹

Some central banks have gone further, taking measures to proactively mitigate climate change and promote a low-carbon transition by attempting to nudge common investment behaviour in the direction of considering climate risks, and thereby influencing lending criteria and practices. Examples of such actions include promoting bank lending to green

¹¹ In March 2022, the United Nations Secretary-General established the High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities.

projects, as well as greening non-monetary policy portfolios, foreign reserve management, central bank financing and/or lending quotas, as well as greening the collateral framework for monetary policy operations. These greening measures are deployed through the use of a variety of climate central banking tools (German Development Institute, 2016; European Parliament, 2022).

b. Transition approach: realizing green structural transformation

Given that LDCs and (other developing countries) already suffer from the severe impacts of climate change and nature-related loss, LDCs' financial sectors primarily need to contribute to the green transition and climate adaptation within the overall context of achieving fundamental progress on structural transformation.

The green transition-based approach to financial alignment is characterized by a robust engagement with transforming productive activities (Heinrich-Böll-Stiftung et al., 2022; Kedward et al., 2022). It departs from the imperative of realizing green structural transformation (Gabor, 2022) by prioritizing instead the role of the developmental State in directing finance to desired green sectors for achieving the transformation of productive systems. Accordingly, it eschews the delegation of the pace and nature of green structural transformation to private finance, as advocated by the conventional approach, in favour of alignment of financial systems to climate goals. It sets an ambitious agenda centred on the coordination of quantitative and qualitative credit allocation policies with fiscal and green industrial policies. By encompassing sector-specific prices or quantities of credit, it has the potential to promote distinctive low-carbonization pathways. Crucially, given a global financial system that still mainly prioritizes short-term profits, it explicitly sets out to redirect credit flows towards green productive activities (Gabor, 2022). Traditionally, quantitative tools, such as credit ceilings and quotas, have been a feature of credit allocation policies that are aligned with industrial policy. Under climate central banking, Bangladesh, India and Japan, for example, have implemented credit allocation policies that ration the flow of credit to high-carbon activities as part of their financial alignment. According to a survey by a group of academics (Augoyard et al., 2021),¹² 42 per cent

LDCs' financial systems should contribute to climate adaptation within the context of a green structural transformation



of the 26 central banks and financial supervisors in the Asia-Pacific region have implemented such credit allocation policies.

An added advantage of the green transition-based approach is that it goes beyond a narrow focus on mitigation, extending financial alignment to also encompass adaptation. In the context of rising physical risks, it thus incorporates a more proactive and dynamic alignment of financial systems.

By drawing the link between financial risk and the transition of the real economy, the developmental approach tailors alignment of the financial system to country-specific scenarios (UNCTAD, 2023a). It also automatically operationalizes developmental central banks. This is very important, given the potentially wide-ranging trade-offs implied by climate action and available evidence from the literature (see, for example, Augoyard et al. 2021) that systems for monitoring and evaluating the results of financial institutions' sustainable finance measures generally do not track equity and development impact aspects of performance. Augoyard et al. (2021) found that the choices of measures relating to the achievement of climate and environmental objectives by surveyed institutions in the Asia-Pacific are influenced mainly by measures being implemented in other countries, or by an internal assessment determining the need

¹² Those surveyed included members, associate members and observers of the South-East Asian Central Banks (SEACEN) Research and Training Centre, and two other non-SEACEN-associated monetary and financial authorities from the region. Of SEACEN's 19 full members, 16 responded, and a total of 10 associate members, observers and others responded, equivalent to an 84 per cent response rate achieved out of a total of 35 institutions surveyed.

for such measures and the assessed capacity of financial institutions. They also found that the opinions of other stakeholders, recommendations stemming from academic research and national government requests have little, if any, influence on central banks' and supervisors' decisions on which measures to implement. Crucially, they noted that the component of performance monitored the least is equity, despite the fact that the concept of equity is important for achieving a just transition.

3. Elevated risk of an unjust transition in least developed countries

Central banks of LDCs are under pressure to simultaneously converge towards global best practices and develop climate-change-adapted technical capacities (human and capital). This dual pressure places them in a highly disadvantaged position for achieving a just transition. According to the NGFS, the lack of high-quality, granular and consistent data across jurisdictions remains a major challenge, globally, for addressing climate-related risks and opportunities. Mutually reinforcing and collaborative actions across a variety of ecosystem role players are needed to disincentivize greenwashing, encourage consistency and standardization, provide additional layers of transparency, and reduce the costs of regulatory compliance implied by climate central banking. Micro, small and medium-sized enterprises (MSMEs) in LDCs lag behind in their ability to respond to pressures from various stakeholders to prove their accountability and commitment through sustainability disclosures. They are also more likely to be excluded even from voluntary consultative mechanisms, leading to a self-selection bias in certification that hinders progress towards achieving low-carbonization. This raises the concern that, to encourage wider certification adoption, standard setters may relax certain certification-acquiring requirements. Additionally, national (and regional) sustainability standards, although increasingly devised to make international standards more applicable and adaptable to local markets, lack recognition in international markets (UNCTAD, 2023b). For central banks of LDCs — where ecosystems for climate central banking are the least mature – low capacities and resources are compounded by the increasingly short time frame suggested by scientific evidence to avert climate disaster. This implies that LDCs face a herculean task.

Globally, all countries aim to achieve a “just transition” which is understood to mean a strategy to ensure that the greening of economies generates positive economic, social and environmental impacts with a

fair distribution of the benefits for all (UNFCCC, 2020). It aligns with the SDG principle of leaving no one behind. It is not a controversial concept, but can entail very different challenges depending on a country's stage of development. Compared to other countries at more advanced stages of development, LDCs face a greater risk of an “unjust” transition because of the structural impediments that plague their economies, including greater informality, youth bulges and attendant high rates of unemployment, higher rates of poverty, distinct ecological and climate challenges resulting in the accelerated deterioration of livelihoods, increasingly harder access to development finance and limited institutional capacities. All these conditions make it harder for these countries to achieve a just transition, and exemplify the push-and-pull dynamic that is the hallmark of development policymaking and the political economy in LDCs. Climate policies will only intensify this dynamic.

Climate change poses unprecedented challenges to LDCs. This is exemplified by the fact that four LDCs (Malawi, Mozambique, the Niger and South Sudan) feature among the 10 most climate-affected countries in the Global Climate Risk Index 2021 (Eckstein et al., 2021). In the vast majority of LDCs, climate change is increasing the frequency and severity of droughts, storms, cyclones and other weather

LDCs face a higher risk of an unjust transition due to:

- Deteriorating livelihoods**


- Difficult access to development and climate finance**


- Limited institutional capacities**


- Harsher trade-offs from climate action**



events, affecting disproportionately the populations that live in coastal areas and/or rely on agriculture. It thereby also exacerbates food insecurity and water scarcity problems. To attenuate the adverse social and economic effects of climate change in LDCs, an unprecedented increase of investments in climate adaptation is necessary (UNCTAD, 2021a). It also necessitates coherence between climate change adaptation and disaster risk reduction.

Moreover, on the development front, and due to their limited progress with structural transformation (UNCTAD, 2020), a distinct feature of many LDCs is the high proportion of their populations that remain dependent on agriculture. This presents a systemic risk, as the impact of climate change broadens and intensifies over time. Achieving climate-aligned development in LDCs will thus require structural transformations that shift their production structures towards activities and sectors that contribute to energy and resource security, low-carbon agriculture, climate resilience, food security and lower inequalities (UNCTAD, 2021a; 2021b). Consequently, achieving a just transition in LDCs by implementing climate change policies is inconceivable without appropriate industrial policies implemented alongside, because labour markets and unemployment are likely to be the first and the worst affected by a low-carbon transition

For example, long-term energy transition goals need to be weighed against nearer term considerations such as energy affordability, coverage and security.¹³ In this respect, LDCs are already constrained in their ability to cushion their populations from the cost implications of an energy transition. Progressive social protection practices implemented in the wake of COVID-19 are being tested by a shrinking fiscal space related to global economic uncertainty and debt burdens. Consequently, decisions on climate policies in LDCs will require an assessment of the available fiscal space over the long term, based on an analysis of sovereign debt dynamics.

From an institutional perspective, for most LDCs identifying alternative socioeconomic development paths is complicated by the deep uncertainty surrounding the evolution of climate change, which needs to be modelled to support the development of appropriate climate policies. Modelling tends to be outside the normal range of activities of most national statistical offices in LDCs. Consequently, they lack the capacity to collect appropriate data and track environmental and social impacts. It may take several years until proper data are collected and appropriate

¹³ For a detailed discussion on energy issues in LDCs, see UNCTAD, 2017.

Achieving a just transition in LDCs is inconceivable without appropriate industrial policies implemented alongside

modelling approaches developed. Moreover, a just transition in commodity-dependent LDCs calls for mitigating the risks from stranded assets, and finding ways to increase banks' available capital to extend credit for greening the economy, the financing of which might otherwise dry up as a consequence of financial alignment (Fanizza and Cerami, 2023; Brav and Heaton, 2021).¹⁴ Some industry experts are pessimistic about the prospects of a global consensus in this area. Under such circumstances, the already inadequate institutional capacities in LDCs are doubly strained by the concurrent need to anticipate, assess and address the social risks of the transition to ensure no one is left behind.

While the responsibility for climate-aligned structural transformations and the design of climate financing mechanisms rests primarily with governments and public authorities at the domestic level in LDCs, there are also critical international dimensions to a just transition in LDCs. A prevalent structural feature of the global financial architecture is that financial intermediaries and private capital give priority to short-term profits. This contributes to shortages of long-term and patient capital funding with a high risk tolerance of the kind especially needed for development projects in structurally weak economies, such as the LDCs, and for their low-carbon transition (UNCTAD, 2019b). As emphasized by UNCTAD (2023a), it is patient capital funding that connects finance with long-term structural transformation and countercyclical support in times of crises. This chronic deficit of long-term and sustainable investment in economies that need it the most underpins the urgency of aligning international finance to global climate goals in LDCs.

In addition, the recent evolution of the ODA architecture and development finance landscape, framed as moving "from billions to trillions", has seen donors and multilateral organizations support the development of more tools that de-risk private sector financial investments, including green

¹⁴ See also <https://gsh.cib.natixis.com/our-center-of-expertise/articles/why-we-need-a-shaded-taxonomy-from-green-to-brown-and-in-between>, and <https://esgclarity.com/defining-brown-activities-more-challenging-than-defining-green/>.

Climate change has adverse effects on credit ratings of developing countries

investments (UNCTAD, 2019b). However, these tools can cause a deterioration in the financial position of host governments when the latter are asked to guarantee private investments and provide subsidies for green transition and green growth that can increase public debt (e.g. due to contingent liabilities). With regard to attracting investments in LDCs, the fundamentals for private sector investment remain unchanged; it can be difficult to realize a profit in the shorter term, regardless of whether or not a project is green. The reality of conditions in LDCs means that an overreliance on financial sector instruments or private sector engagement has a higher probability of unleashing unintended consequences, as argued by UNCTAD (2019b) and Emery (2023). It illustrates the need for coherence between policy efforts to reduce carbon emissions, on the one hand, and the world of finance and investment on the other (UNCTAD, 2019a). All the more so considering LDCs already face risks posed by multiple concurrent transitions (e.g. graduation from concessional windows or income groups) and limited capacity to leverage private investment for development.

The incorporation of climate-related physical risks into the credit models used by credit rating agencies and financial institutions as part of climate policy regulations, for instance, disproportionately affects climate vulnerable LDCs. This is because credit rating agencies¹⁵ are more likely to downgrade climate vulnerable LDCs, thus discouraging investments in their bonds, and making it more difficult for LDC governments and the private sector to invest in climate adaptation and cover climate-related losses. Emerging evidence suggests that, unlike in developed economies, vulnerability to climate change

has adverse effects on credit ratings of developing countries, including LDCs, and on the sovereign cost of capital for them (European Parliament, 2022; Cevik and Tovar Jalles, 2020).

Risk assessment is a feature of well-functioning capital markets, and credit rating agencies play an important role in modern financial markets. However, UNCTAD analysis suggests that their sovereign ratings are often based more on subjective assessments than on “fundamental” variables related to debt sustainability (UNCTAD, 2015). More recent post-pandemic research supports UNCTAD’s initial analysis, and points to an entrenched bias in credit ratings; for instance, a detailed analysis of ratings for African countries revealed evidence of likely significant misestimations of risk by the world’s leading credit rating agencies (UNDP, 2023; DESA, 2022). Crucially, this may mean that imbalances in the international financial system cause LDCs to bear the brunt of the costs of the global low-carbon transition.

In a world of interdependent energy, labour and financial markets, a just transition in poorer countries is made more difficult by the lack of effective global mechanisms to deal with negative transnational impacts created by the implementation of transition policies in other countries. Of particular importance are the potential effects from the implementation of climate policies by trade partners (UNCTAD, 2022a). This can be detrimental not only to employment in directly affected sectors, but also to the labour force and entrepreneurs in other sectors connected through supply chain networks. There can also be adverse effects on government revenues, and therefore on the public debt of LDCs and, consequently, on their scope to undertake needed investments in public services, including the productive infrastructure required to facilitate structural transformation and sustainable development (encompassing climate change mitigation and adaptation).

The contribution of LDCs to the reduction of global emissions is governed by the UNFCCC’s principle of common but differentiated responsibilities and respective capabilities (United Nations, 1992: 4). This principle has significant implications for climate mitigation strategies in LDCs, and raises related issues of equity in global emissions reductions. The persistently large development deficits of LDCs could imply higher emissions necessitated by unequivocally desirable development progress (UNCTAD, 2022a). Therefore, it will be important for climate mitigation actions to be designed in ways that pay specific attention to how emission reduction actions could affect development and human progress (UNCTAD, 2022a).

¹⁵ They can also hinder the effective implementation of initiatives intended to relieve a country’s debt distress. For example, countries contemplating availing themselves of the Group of 20’s Debt Service Suspension Initiative (DSSI) launched in the wake of the COVID-19 pandemic, were wary that a suspension or deferment of debt payments to the private sector would be classified as restructuring and default under credit rating agencies’ criteria, and thus further hamper their access to development finance and worsen their debt positions. See https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/PB_131_final.pdf and <https://www.uea.ac.uk/climate/evaluating-sovereign-risk>.

A key problem with central banks acting on climate change is that their choice of measures and instruments inevitably entail wide-ranging policy trade-offs and distributional effects. The trade-offs from climate policy actions are by no means exclusive to LDCs. However, they are amplified by these countries' structural impediments, which also means that the attendant redistributive impacts of financial alignment are potentially harsher and larger in LDCs. Consequently, the potential role of financial alignment in promoting sustainability in the financial system and "greening" the economy is more contentious in LDCs, and will need to be complemented by other measures. Thus, financial alignment, as defined by the conventional approach, is likely to be insufficient, in and of itself, for supporting pathways towards climate adapted structural transformation. This is partly because the low levels of financial development in LDCs may limit the transmission of climate policies through monetary policy, but also because implementation of the Basel Framework regulations has revealed that regulating and supervising banks in developing countries can be prohibitively costly, and that credit ratings for financial institutions have been inaccurate (World Bank, 2020). An additional complication is that, for many developing countries and LDCs, monetary policy primarily serves as a tool for currency stabilization, such that financial alignment must also consider the implications for exchange rate policies (AfDB et al., 2021).

C. Conflicts and controversies around central banks' climate actions

1. Central bank mandates: Do they matter?

Overall, there remains no consensus on the extent to which climate change (or other environmental risks) should be incorporated into existing operational frameworks, or whether central banks should even play a supportive or promotional role in scaling up green finance (Cossin and Bourqui, 2020; Dikau and Volz, 2021; Goodhart and Lastra, 2023; Jordan, 2022; Krogstrup, 2022; Schnabel, 2023). For example, among European central banks, a general consensus has developed that they (and other supervisory bodies) cannot ignore climate change. However, the Federal Reserve (the central bank of the United States of America) takes the view that doing so could lead to its overstepping its wider economic mandate to promote "maximum employment, stable prices,

Redistributive impacts of financial alignment are potentially harsher and larger in LDCs

and moderate long-term interest rates" (*Financial Times*, 2023; European Parliament, 2022).¹⁶

As custodians of monetary policy, central banks are entrusted with a mandate by parliament or by law, and this can differ across jurisdictions, as they are influenced by domestic considerations. Central bank mandates have tended to evolve not only with changes in economic theory, but also in response to the impact of seismic global macroeconomic developments on domestic economies.

Technically, to use direct instruments for climate central banking, central banks would need some form of a sustainability mandate. According to a recent study, out of the 135 central banks covered by the IMF Central Bank Legislation Database, only 12 per cent had explicit sustainability mandates (Dikau and Volz, 2021). A far larger number (40 per cent) were mandated to support government policy priorities, which mostly included sustainability goals. Accordingly, to the extent that governments' policy objectives include climate change mitigation or adaptation, a broad interpretation of their mandates could be used to justify their taking action to align their policies to the Paris Agreement without a change of mandate.

However, advocacy on climate risks by central banks that do not have a formal mandate on environmental sustainability could be seen as a bid to gain more power by taking on additional responsibilities, especially in contexts of weak public control over private financial dynamics (Boneva et al., 2022; Baer et al., 2021; Husted et al., 2020). Moreover, considering that climate risk is a subset of the wider nature-related risk and biodiversity loss landscape, it could be argued that this is not part of the conventional business of central banks, nor is it within their competence. This raises related concerns that the entry of central banks into climate central banking potentially opens the door to a perpetual drift in central bank mandates.¹⁷

¹⁶ See also <https://www.reuters.com/business/finance/central-banks-walk-tightrope-juggling-mandates-mike-dolan-2023-03-15/>.

¹⁷ It is notable that the NGFS has expanded its focus beyond climate risk to take into account nature-related risk and biodiversity loss.

Central bank measures to proactively mitigate climate change and promote low-carbon transition require coordination with Government

The degree of central bank independence varies considerably across countries. Nevertheless, a theoretical and empirical convergence on granting them policy independence is discernible over time. Thus, over the period 1972–2012, 72 per cent of reforms were in favour of central bank independence and only 14.7 per cent were for decreasing their independence (Garriga, 2016). The trend towards central bank independence was generally premised on the notion that those banks had a well-defined objective of *price stability*, based on the theoretical and empirical understanding that low and stable inflation is a necessary precondition for growth or development to take place. A recent study also points to the increased focus on the goal of price stability across the world since the 1980s. Especially in developed countries, central banks have, to varying degrees, been given formal responsibility for price stability (micro-prudential regulation) and financial stability (macroprudential regulation). Several regions, such as South and East Asia, West Asia and North Africa, appear to be lagging behind in the reform process (Romelli, 2022).

It is notable that reforms that increase the level of central bank independence have tended to follow periods of high inflation rates. For example, in the early 1990s, the widespread adoption of central bank independence, and, with it, the practice of inflation targeting, was precipitated by the oil shock in the 1970s. Scholars point to historical evidence (including the recent history of the global financial crisis) to suggest that systemic banking crises and currency or sovereign debt crises are not generally associated with reforms that increase the level of central bank independence. Rather, the increased independence is largely due to external inducements, regional convergence and status quo bias. Scholars also note important variations in the level of central bank independence, depending on countries' level of development and external pressures (such as obtaining an IMF loan) for triggering reforms in favour of central bank independence, as well as precise, narrowly defined central bank mandates in developing economies (Akhtar Aziz, 2013; Dall'Orto Mas et al., 2020; Draghi, 2018; Romelli, 2022).

Central bank independence continues to be considered a virtue, but its desirability and relevance has increasingly been called into question since the 2008–2009 global financial crisis and the COVID-19 pandemic, both of which necessitated exceptional coordination between fiscal and monetary authorities. This challenged the narrow view of central bank independence, and increasingly, its relevance for development (Wachtel and Blejer, 2020; Goodhart and Lastra, 2023; UNCTAD, 2019a; Akin et al., 2021).

Historically, central banks coordinated with ministries of finance and other government agencies to proactively steer credit and support major structural change of the type required by the climate crisis, thereby complementing proactive fiscal and industrial policy regimes (Kedward et al., 2022). Such coordination, still present in many LDCs (see annex to this chapter), is virtually absent in most developed economies, many of which have adopted frameworks of central bank independence (Kedward et al., 2022). The absence of such coordination poses a particular challenge for central banks with narrowly defined mandates that focus on price stability, if they were to take measures to proactively help mitigate climate change and promote low-carbon transition. Such measures implemented in isolation (i.e. in accordance with their independence, and thus not acting in coordination with their governments) could be considered controversial.¹⁸ This area of climate central banking carries the highest probability of unleashing complex trade-offs and distributional impacts, decisions for which typically fall outside the purview of central bankers. It is, in particular, an area where the legitimacy of climate central banking attracts increasing debate.

One further complication for central banks is that the function of supervising and enforcing financial regulations requires a financial stability mandate.¹⁹ Not all central banks necessarily have this mandate, even in developed countries, which limits their access to the tools needed for them to play a more fundamental role in setting the direction of trends and behaviours for the financial sector and its associated players. Consequently, in the more common scenario of functions that are distributed across several authorities that oversee monetary policy and financial sector regulation in an economy, safeguarding financial stability often necessitates the cooperation of central banks, financial market supervisory authorities

¹⁸ For a more detailed explanation on some of the pros and cons of climate central banking see (UNCTAD, 2019a; Şimandan and Păun, 2021; Boneva et al., 2022, 2021).

¹⁹ See World Bank (2020) for an explanation of banking regulation and supervision.

and governments, although their roles tend to vary by country.

2. Central bank mandates in the least developed countries

Looking specifically at the case of the 46 LDCs, most of their central banks address multiple objectives, including price stability, financial stability and currency stability, as their main monetary policy targets (figure 4.2). In addition, their central banks are often required to support economic development, directly or indirectly. They also typically maintain tighter links with governments, and manage public debt in their discharge of monetary policy (see the annex to this chapter).

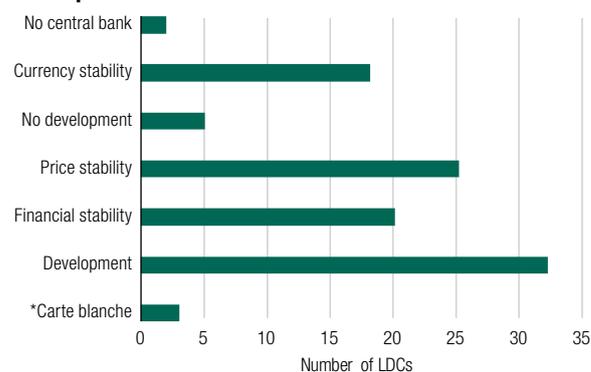
UNCTAD's analysis (see the annex to this chapter) of LDCs' central bank mandates suggests that promoting development is an explicit or implicit mandate in 32 (or 70 per cent) of them (figure 4.2).²⁰ Five LDCs (Haiti, Lesotho, Malawi, the United Republic of Tanzania and Zambia) where the central banks do not have a development mandate underwent (in some cases several) IMF-sponsored structural adjustment programmes. Development mandates are most often subordinate to a central bank's primary objective in 16 LDCs, and 20 LDCs' central banks have financial stability as a co-objective, though this objective is subordinate to that of price or currency stability in 10 of them.

Apart from the case of Djibouti, no LDC central bank appears to have an explicit mandate for sustainability, although two of them (in Ethiopia and Nepal) have mandates that refer to sustainable development and three of them (in Bangladesh, the Lao People's Democratic Republic, and Sao Tome and Principe) have mandates that appear to allow them to exercise discretion. This cluster of six central banks thus appears to have the possibility to implement climate central banking within their existing mandates. However, it could also be argued that all central banks of LDCs endowed with a development mandate could infer from that mandate that they can provide some form of support for sustainability, especially if the mandate specifies supporting or being in accord with government policies. Of those central banks, 15 have both a development and financial sustainability mandate, and, presumably, could be less wary about venturing into climate central banking without an explicit legal sustainability mandate.

²⁰ Countries served by the Central Bank of West African States are accounted for individually in the analysis.

Figure 4.2

Principal monetary policy targets of central banks in least developed countries



Source: UNCTAD secretariat.

* Note: The legal texts of the central banks of Bangladesh, the Lao People's Democratic Republic, and Sao Tome and Principe effectively give them freedom to implement monetary policy as they deem necessary or appropriate.

D. How central banks in least developed countries can select and use climate tools

1. Monetary policy and prudential regulation in least developed countries

Financial systems in LDCs are typically bank-based, and foreign banks tend to have a significant presence.²¹ Access to credit is fragmented, and differs between countries and borrowers. In several countries, very poor households and small enterprises often rely on informal money lenders, including microfinance institutions, for their liquidity needs. These sources of finance typically charge high interest rates and use predatory practices. Microcredit initiatives are not particularly noted for achieving significant transformative changes.²²

In LDCs with more developed banking systems, access to credit for relatively large companies might be easier, as long as they do not have a very high proportion of non-performing loans. Credit availability for these companies is important for structural transformation, since it can affect their ability to undertake productive investments and expand. Indeed, credit availability and the success of industrial policies are often interlinked. As far as broader financial services are concerned, among

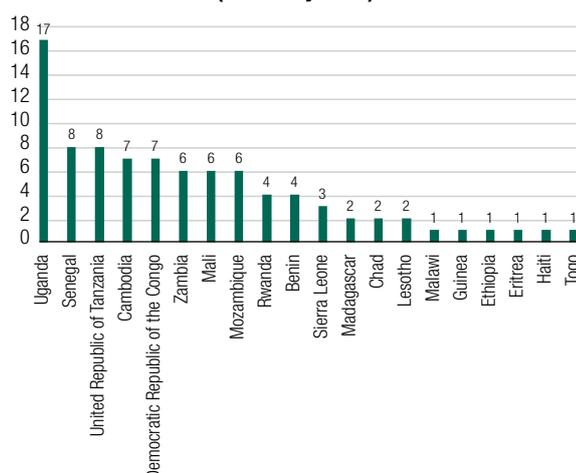
²¹ Apart from Ethiopia, LDCs grant licences to foreign entities to provide financial services and become part of the domestic financial sector as long as they satisfy specific regulatory requirements.

²² For a review of some empirical evidence on microfinance that covers several developing countries, see J-PAL, 2018.

interesting developments in recent years is the popularity of mobile phone payment systems across several LDCs. The providers of such systems are typically non-bank institutions that are not subject to regulation, which poses risks to financial stability (Oduor and Kebba, 2019).

UNCTAD's analysis of five providers of private credit active in LDCs finds that private credit flows range from supporting projects to boosting financial inclusion, as in Zambia, short-term loans for groups and individuals in Benin, a copper mine in Eritrea, a heavy fuel oil power plant in Senegal and digital communications infrastructure in the United Republic of Tanzania (figure 4.3).²³ Private credit also flows to small and medium-sized enterprises (SMEs), but the proportion of flows to foreign/foreign-owned projects, such as independent power producers, impact investors and joint ventures with State-owned companies, is

Figure 4.3
Selected private credit projects in least developed countries 2004–2023 (as of May 2023)



Source: Websites of OIKO Credit, Triple Jump, Emerging Africa Infrastructure Fund, Vantage Capital and ElectriFi.

Note: Due to the opaque manner in which information is provided by private credit funds, the number of projects is likely not exhaustive. It is also not possible to determine if lines of credit are from blended sources. Inclusion of a project implies that private credit provision is significant in project activities.

²³ Due to the opaque manner of information provision by private credit funds, the analysis offers merely a snapshot, and does not claim to be either comprehensive or to take into account the fact that credit may be blended. Information on the total amount of the funding extended is not always available. Some of the private credit consists of lending to microfinance providers. Moody's classifies private credit, which is one of the fastest-growing segments in global lending, as non-bank lending to mostly private-equity-owned, middle-market companies that are not publicly traded or issued. (See https://www.moody.com/web/en/us/private-credit.html?cid=F499DD7EF4D17482&gclid=EAlaIQobChMI9ICF6sjygAMVBpeDBx3OwQIXEAAAYBCAAEgLYm_D_BwE.)

far from insignificant. It is not immediately obvious if the totality of private credit is captured by prudential regulation in LDCs. According to Moody's, private credit and equity funds are globally subject to minimal regulatory scrutiny, or generally escape it altogether.

Another distinct characteristic of domestic financial institutions in LDCs is that they typically hold a significant proportion of the national sovereign debt. This creates strong links between the financial system and the government. State-owned banks have also traditionally played an important role in LDCs' financial systems. However, many of them have been privatized in recent decades, as part of IMF and World Bank structural adjustment programmes (UNCTAD, 2019a).

The COVID-19 pandemic created pressures on the financial systems of many LDCs (see section G), as evidenced by an increase in non-performing loans of households and firms, with negative impacts on the liquidity and solvency positions of their financial institutions. In many of these countries, government and central bank interventions were necessary to stabilize domestic financial systems. Nevertheless, their ability to undertake such countercyclical macroeconomic and financial interventions during the pandemic was significantly restricted by their limited policy space and the shallowness of their financial systems (UNCTAD, 2021b). This means that a significant proportion of domestic firms lacked access to formal financial support measures.

Monetary policy implementation in LDCs faces several challenges in practice. For example, the rise of private and public debt in recent years has created pressure on their central banks to keep interest rates low, so that interest payments by households, firms and governments would be manageable. However, when debt is denominated in a foreign currency, low interest rates can result in currency devaluations that create debt repayment difficulties (Christensen and Schanz, 2018). They also create inflationary pressures that can undermine price stability objectives.

As far as financial regulation is concerned, many LDCs rely on microprudential frameworks (i.e. focusing on the exposure of the financial system to individual institutions' risks). The use of macroprudential approaches (which focus on the importance of building buffers for protecting banks from systemic risks) is less common (Christensen and Upper, 2017). It is notable in that context that LDCs, although not members of the Basel Committee on Banking Supervision, often have an incentive to implement Basel-related regulations, because it signals to foreign investors that their domestic financial systems are stable (Oduor and Kebba, 2019).

Apart from capital and reserve requirements, financial regulators in LDCs often use credit controls²⁴ that set ceilings and minimum targets for the expansion of credit to specific sectors and activities. These controls are also used for supporting countries' development and industrial policy targets, in addition to supporting monetary policy and financial policy targets. This departs from the practice of central banks and financial regulators in developed countries, where fiscal and monetary authorities typically do not coordinate actions.

Given the conflicts and controversies posed by climate central banking, the institutional environment for coordination of fiscal, monetary and financial policies that characterizes many LDCs is thus likely to be more appropriate for addressing the climate crisis. This is especially so because, across all economies, climate mitigation and adaptation require even more policy synergy than traditional economic policy targets (IPCC, 2015). For example, decarbonization in specific sectors can be achieved more rapidly if green subsidies and regulatory interventions are combined with more favourable financing conditions for firms and sectors that need to reduce their environmental footprint.²⁵ However, a significant challenge is that, in some cases, specific tools may need to be used to achieve more than one target; for example, credit controls might need to be used to achieve both development and financial stability targets. This means that a careful design of such policy tools is necessary to ensure that multiple targets can be achieved and trade-offs minimized.

a. Intersections between central bank mandates and climate tools in least developed countries

Central banks in LDCs can use their mandates as a guideline to identify which climate tools (annex 1) they can potentially use. Figure 4.4 shows the link between mandates and climate tools. Central banks need to consider developing climate-adjusted analytical frameworks if they target macroeconomic variables such as inflation, employment and the exchange rate, because all these variables can be affected by the physical and transitional effects of climate change. Given that all central banks in LDCs target at least one macroeconomic variable, they need to consider development of climate-adjusted analytical frameworks as an option.

The next question is whether financial stability is included in their mission. If it is, they will need to

²⁴ For a historical account of the use of credit controls by developed countries, see Bezemer et al., 2023.

²⁵ For the importance of policy coordination for achieving climate targets, see also Dikau and Ryan-Collins, 2017.

Policy tools should be designed in a way that ensures that multiple targets can be achieved and trade-offs minimized

consider using climate risk exposure tools to protect the financial institutions of the country from their exposure to risks. However, an additional issue is to what extent the central bank uses a macroprudential approach to financial stability, and, if so, whether the kind of approach it uses is weak or strong. The key feature of a macroprudential approach is its emphasis on how the financial system as a whole works and the systemic risks that are created at the macro level. In the weak version, the feedback effects of the financial system on the macroeconomy are not explicitly considered in practice. In the strong version, on the other hand, those feedback effects are deemed to be particularly important (Dafermos, 2021; Dafermos and Nikolaidi, 2022).

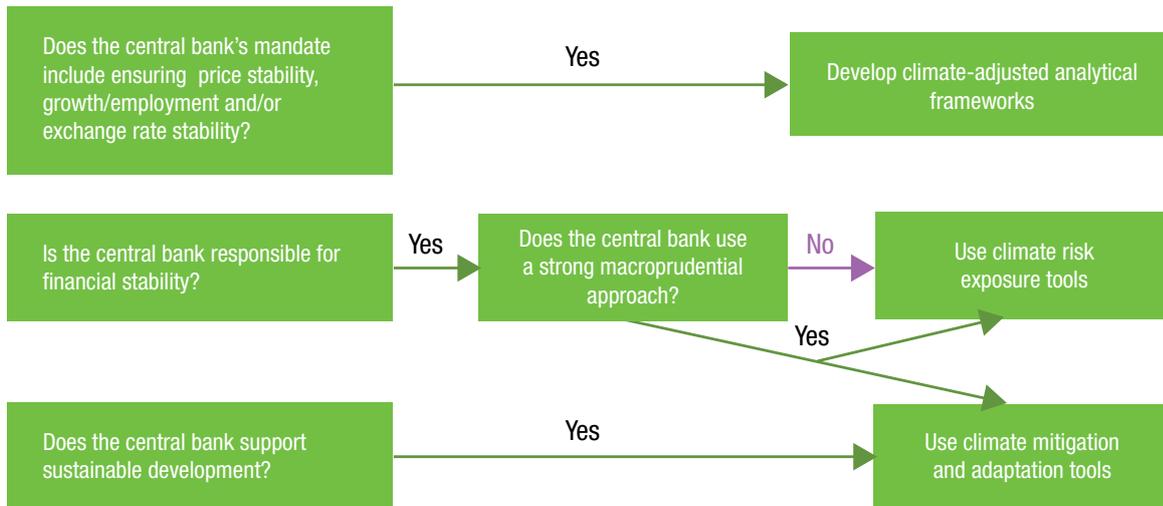
A strong macroprudential approach requires the use of climate mitigation and adaptation tools (figure 4.4), as illustrated by two examples. First, if banks in an LDC provide enough finance for climate adaptation, the companies and households will be better protected from climate-related events, and will be less likely to default on their debt. Hence, the financial system as a whole will be less exposed to physical risks. Second, the provision of more finance for decarbonization projects through the use of the bank's climate mitigation tools could make domestic industries less vulnerable to climate policies implemented in other countries. As a result of this, the domestic financial system would become less exposed to physical risks associated with a green transition. Overall, if climate mitigation and adaptation tools are used in an effective way, they can improve the climate resilience of the financial system.

The use of climate mitigation and adaptation tools is also recommended where a central bank in an LDC has an explicit target to support sustainable development, since these tools can contribute to achieving that target.

More broadly, it should be emphasized that the use of mandates for identifying potential climate tools need not be a static exercise. Governments can consider modifying the mandates of their central banks to make them support climate-aligned development.

Figure 4.4

Central bank mandates and climate tools



Source: UNCTAD secretariat.

b. Transmission channels, target consistency and potential side effects

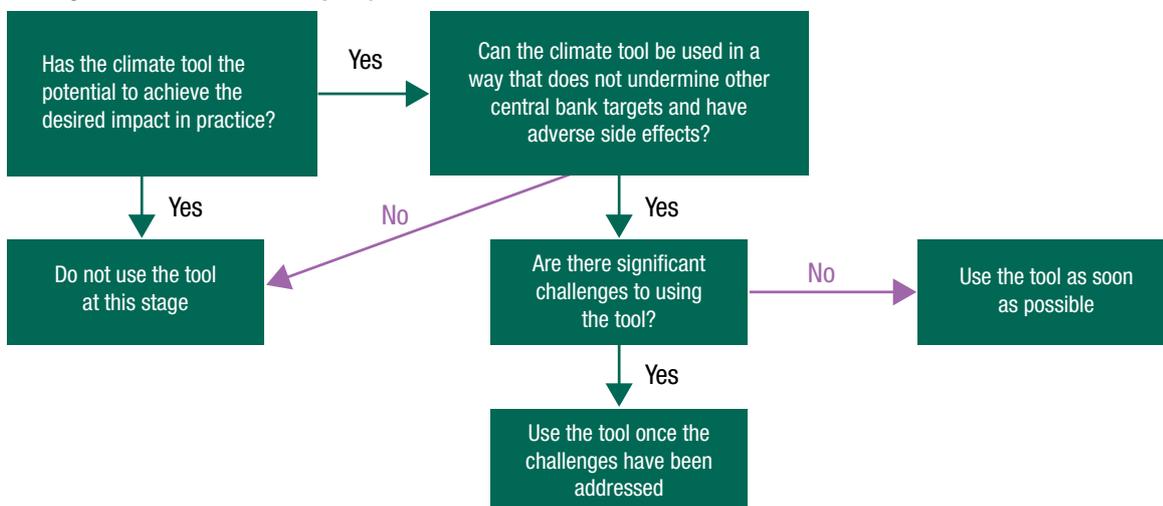
The existence of a specific mandate is a necessary, but not sufficient, condition for using certain types of climate central banking tools. Once potential climate policy tools have been identified, central banks need to examine a range of other issues before they decide which tools to use (figure 4.5). An important question is to what extent a specific climate tool has the potential to achieve the desired impact in practice. For example, in an economy in which formal credit constitutes only a small proportion of the total credit given to households and firms, the introduction of green credit controls may not have a significant impact on emissions, and therefore there is little point

in using such a tool. In other words, the central bank authorities should not use a tool which they believe does not fit the structure of the economy, at least at this stage.

If the tool has the potential to achieve the desired impact, the next question is whether its use might undermine other targets, especially primary ones. For instance, at a specific point in time a central bank might aim at a certain increase in the provision of credit to support economic growth and achieve a specific inflation target. However, the introduction of climate criteria in credit controls and refinancing operations might reduce credit to carbon-intensive sectors. Therefore, the central bank needs to evaluate to what extent the increase in green credit

Figure 4.5

Assessing a central bank's climate policy tool



Source: UNCTAD secretariat.

will counterbalance the reduced credit in order for the total credit to remain the same.

It is also important for a central bank to take into account to what extent the reduction in the credit provided to carbon-intensive sectors might undermine development targets and cause adverse distributional effects, for example because many poor people might be working in carbon-intensive industries. In such cases, a central bank's isolated use of climate mitigation tools is not recommended. Such tools can be used only if they are accompanied by other fiscal, industrial and social policies that ensure that the target of reducing emissions will not undermine social and development targets. If coordination with other policies is not possible, the use of the tool should be postponed until a coordination mechanism has been put in place.

Another case in which some side effects might arise is the establishment of minimum targets for the provision of credit to specific sectors or activities that are important from a climate perspective. Although an increase in credit availability might be beneficial for achieving green objectives, an overreliance on credit could lead to over-indebtedness of companies and possible defaults, thereby undermining central banks' financial stability objectives.

Challenges related to the so-called Tinbergen rule should also be considered (Dikau and Volz, 2021). According to this rule, there is a risk that banks could have too many targets and too few tools. Such a risk applies to climate mitigation and climate adaptation tools. The best way to address it would be for the tools to be designed in a way that does not undermine the more traditional targets (as pointed out in the example above about credit controls and refinancing operations). If this is not possible, some trade-offs might arise.

2. Classification of recommended climate central banking tools

A distinction is made between three types of tools that central banks in LDCs could potentially use: (i) climate-adjusted analytical tools; (ii) climate risk exposure tools; and (iii) climate mitigation and adaptation tools. *Climate-adjusted analytical frameworks* enhance central banks' understanding of the way the macroeconomy can be affected by climate change, and its implications for the conduct of monetary policy. *Climate risk exposure tools* aim at reducing the exposure of financial institutions to climate-related financial risks. *Climate mitigation and adaptation tools* aim to contribute to the reduction

The central banks of LDCs need to pay explicit attention to the macroeconomic implications of the structural features of the global financial architecture

of GHG emissions and help with the financing of climate adaptation investment. Examples of tools for each of these categories are described below. The applicability of these tools will vary with the central bank's mandate and extent of access to monetary policy tools.

(i) Climate-adjusted analytical tools

Climate-adjusted macroeconomic projections: Such projections take explicit account of the impact of the physical and transition effects of climate change on both the demand- and the supply-side of the macroeconomy, paying attention both to domestic and global channels. For example, climate change can have a significant impact on inflation.²⁶ The central banks in LDCs also need to pay explicit attention to the macroeconomic implications of the structural features of the global financial architecture described in section B. For instance, they should consider the possibility that the costs of borrowing might increase for their economies as a result of the incorporation of physical risks into the evaluations of credit rating agencies.

However, the development of modelling tools that can be used for conducting such projections is a challenging task due to the unique features of climate change (see NGFS, 2019; Battiston et al., 2021). In LDCs, proper modelling tools are unlikely to be available in the near term, and the necessary data are typically missing (UNCTAD, 2023c). Instead, climate-adjusted macroeconomic projections could be of a qualitative nature: monetary authorities could identify the key channels through which key variables can be affected under different climate scenarios and analyse the implications of these channels for macroeconomic and financial stability.

²⁶ Schnabel (2022) distinguishes "climateflation" and "fossilflation". Climateflation refers to the increase in prices that can be caused by the adverse effects of droughts, floods, hurricanes and other climate-related events on the supply of goods and services (see also Beirne et al., 2021)). Fossilflation is a type of inflation that can result from increases in the prices of oil, gas and coal due to carbon pricing policies domestically or abroad. In climate-adjusted macroeconomic projections, such climate effects need to be explicitly analysed.

Monetary authorities might need to update their conceptual understanding of the transmission mechanisms of monetary policy

Climate-adjusted frameworks of monetary policy

transmission: Climate change can affect several transmission channels of monetary policy. First, the impacts of climate change can affect the ability of central banks to control inflation through changes in the policy interest rates (see NGFS, 2020b). For example, climate-related events might cause banks to be less willing to provide credit to the economy. In that case, a reduction in the interest rate might be insufficient to stimulate the economy if inflation is below target. In addition, as the recent food and energy crises have illustrated, an increase in inflation that stems from factors largely beyond the control of central banks can render the interest rate an ineffective tool for achieving inflation targets. Second, climate change impacts can affect the ability of central banks to control exchange rates through changes in interest rates and the use of foreign currency reserves: international investors might be unresponsive to monetary policy interventions when an economy is hit by climate-related shocks. Therefore, monetary authorities might need to update their conceptual understanding of the transmission mechanisms of monetary policy. If such an update leads to conclusions that call into question the effectiveness of existing tools, the ways of using those tools would need to be revised.

(ii) Climate risk exposure tools

Climate stress testing: Climate stress testing exercises allow central banks and financial supervisors to evaluate the exposure of the financial system to transition risks and physical risks under different potential climate pathways. Climate pathways will capture different assumptions about global decarbonization efforts in the coming decades. Following the NGFS (2022), the scenarios that are typically considered in climate stress testing exercises are (a) a *hot house world* scenario in which climate policies remain unambitious; (b) a *disorderly transition* scenario in which climate policies become ambitious after 2030, causing an abrupt transition to a low-carbon economy that is characterized by significant financial losses; and (c) an *orderly transition* scenario whereby the transition starts early (immediately), and thus facilitates a smooth and

steady transition. Climate stress testing exercises have been conducted by several central banks and financial supervisors recently, including by the Bank of England, Banque de France/ACPR, the central bank of the Kingdom of the Netherlands (DNB) and the European Central Bank (ECB) (Vermeulen et al., 2018; Alogoskoufis et al., 2018; Baudino and Svoronos, 2021; Bank of England, 2021; ECB, 2022; Banque de France/ACPR, 2021).

Running climate stress testing exercises requires sufficiently granular data about the regional and sectoral decomposition of bank credit, as well as innovative modelling approaches. A significant challenge for central banks and financial supervisors in LDCs is that they do not typically collect such data. Moreover, they might not have either the capacity or the human resources necessary for running climate stress testing exercises.

Climate risk financial disclosures: Central banks and financial supervisors can ask financial institutions to report their exposure to transition and physical risks. In the absence of detailed data about such exposure, financial institutions can use the loans to carbon-intensive sectors and to climate vulnerable regions (relative to total loans) as proxies for their exposure to transition risks and physical risks, respectively. However, an analysis of climate-related financial risks without the use of scenarios could be misleading

Climate-risk-adjusted capital and reserve requirements:

From a microprudential perspective, the exposure of banks to climate-related financial risks needs to be reflected in their capital and reserve requirements. For example, banks may have provided loans to households and non-financial corporations that risk debt default because they might be suffering financially due to an increase in carbon taxes or because of climate-related events that damage their assets. In such a scenario, the banks need to hold higher capital against those loans to be able to cope with solvency pressures. They might also need to increase their reserves to deal with liquidity pressures linked with climate risks.

(iii) Climate mitigation and adaptation tools

Green differentiated capital and reserve requirements:²⁷

According to this tool, requirements for different types of loans are differentiated on the basis of the climate footprint and greenness of their underlying activities. Green differentiated capital requirements can take

²⁷ Throughout the discussion, the term “green” is used to capture climate mitigation only; it does not include climate adaptation.

the form of green-supporting and dirty-penalizing factors (Dafermos and Nikolaidi, 2021; 2022). In the case of green-supporting factors, the capital requirements for loans that are used to finance green activities decline as an incentive for the provision of such loans. In the case of dirty-penalizing factors, the capital requirements on dirty loans (i.e. those that support high carbon-emitting activities) increase to make it more costly for banks to provide such loans. Reserve requirements can be adjusted based on the greenness/dirtiness of the total assets of banks (Campiglio, 2016; UNEP, 2017).

Climate adaptation capital and reserve requirements:

The idea behind this tool is to incentivize the provision of loans that support climate adaptation projects, such as investments in wind-resilient buildings, the use of drought-resilient seeds, climate-induced firm relocation, or the development of digital business models that reduce the reliance on physical climate-vulnerable assets. Banks would therefore need to hold less capital against loans that are linked with such climate adaptation projects. Moreover, their reserve requirement ratio could be inversely linked to the proportion of climate adaptation loans in total loans that they have provided.

Green and climate adaptation refinancing operations:

Through refinancing operations, central banks provide liquidity to commercial banks. The idea behind green refinancing operations is to make the interest rate on central bank loans a function of the greenness/dirtiness of the balance sheet of commercial banks:²⁸ the higher the proportion of green loans to total loans and the lower the proportion of dirty loans, the lower would be the interest rate at which a commercial bank could get a loan from the central bank. This would incentivize banks to decarbonize their assets. Banks could also pass on the change in the central bank interest rate to the interest rates that they charge their borrowers, affecting thereby the demand for green and dirty loans. Similarly, climate adaptation refinancing operations would imply a lower interest rate for commercial banks that provide more loans that support climate adaptation projects.

Green finance and climate adaptation financial supervision:

Through financial supervision, banks could be instructed to demonstrate engagement with green finance. For example, they could be required to (i) submit climate transition plans explaining how they intend to make their operations and lending practices

Bangladesh is the only LDC that has engaged in climate central banking

climate-aligned (Dikau et al., 2022); (ii) report on the progress made in supporting climate mitigation and adaptation; and (iii) create separate units that deal with climate-related issues.

Green finance and climate adaptation credit controls:

Broadly speaking, credit controls refer to policies that directly affect the quantity or the price of credit (Bezemer et al., 2023). Such policies have been used extensively in LDCs. In the case of green credit controls, central banks or financial supervisors could instruct banks to provide a minimum amount of lending to specific green activities (perhaps at a subsidized interest rate) or place a ceiling on the amount of lending provided to certain carbon-intensive activities. In the case of climate adaptation credit controls, banks could be instructed to provide a specific amount of lending to households or companies that engage in climate adaptation investments.

Green finance and climate adaptation in central bank portfolios:

Central banks could use their own portfolios to support climate mitigation and adaptation efforts (see NGFS, 2020b). For instance, they could create a revolving scheme from their own funds to directly support climate-related projects. In principle, this could be extended to monetary policy portfolios; however, central banks in LDCs do not typically conduct corporate quantitative easing programmes due to the very limited role of corporate bond markets in these countries.

E. Country case studies

1. Overview of case study countries

Having analysed the key issues about central banking and climate change, this section illustrates the potential use of climate tools by central banks in three LDCs: Bangladesh, Zambia and Madagascar. These countries, are useful examples because they differ significantly in terms of GDP per capita – with Bangladesh being the richest country and Madagascar the poorest – and in domestic contexts for climate central banking (table 4.1). Bangladesh was also selected because it is the only LDC that has engaged in climate central banking.

²⁸ See van 't Klooster and van Tilburg (2020) for a proposal on how the Targeted Longer-Term Refinancing Operations (TLTROs) of the ECB could become green.

Table 4.1

Key economic and natural disasters statistics, Bangladesh, Zambia and Madagascar

	Bangladesh	Zambia	Madagascar
GDP per capita ^a (current dollars, 2022)	2 688	1 488	505
Export structure by products ^b , 2021	Manufactured goods (94%), other (6%)	Ores and metals (73%), manufactured goods (11%), all food items (8%), other (8%)	All food items (41%), ores and metals (32%), manufactured goods (21%), other (6%)
Top five export partners ^b , 2021	United States, Germany, United Kingdom, Spain, Poland	China, Switzerland, Liechtenstein, Namibia, Democratic Republic of the Congo, Singapore	France, United States, China, Japan, Canada
Personal remittances ^a (percentage of GDP), 2022	4.67	0.82	4.80
Gini ^a , latest available year	32.4	57.1	42.6
Manufacturing, value added ^a (percentage of GDP), 2022 for Bangladesh, Zambia, 2021 Madagascar	21.76	8.08	9.50
Domestic credit to private sector ^a (percentage of GDP), 2022 for Bangladesh, Madagascar, 2021 Zambia	38.96	11.33	19.11
Annual deaths from natural disasters per 100 000 people, ^c 1990–2022 average for Bangladesh, Zambia, 1991–2022 average for Madagascar	4.29	0.03	0.46
Number of people affected by natural disasters per 100 000 ^c , 1990–2022 average for Bangladesh, Zambia 1991–2022 average for Madagascar	4 663	5 578	2 176
Total annual economic damages from natural disasters ^c (percentage of GDP), 1990–2022 average for Bangladesh, Zambia, 1991–2022 average for Madagascar	0.92	0.03	0.57

Sources:^a World Bank, *World Development Indicators* (<https://databank.worldbank.org/source/world-development-indicators>, accessed July 2023), ^b UNCTADstat, ^c Our World in Data (<https://ourworldindata.org/>, accessed January 2023).

Note: Natural disasters refer to all geophysical, meteorological and climate events including earthquakes, volcanic activity, landslides, drought, wildfires, storms, and flooding. The latest available years for the Gini index are 2016 for Bangladesh, 2015 for Zambia and 2012 for Madagascar. For Zambia and Madagascar, data are missing for several years between 1990 and 2002.

a. Bangladesh

Economic environment and climate change

Bangladesh has achieved substantial labour productivity growth, with a rising share of manufacturing in output and employment on the back of increased specialization in manufactures for export. The country is one of the top LDC exporters of ready-made garments, a sector that has contributed significantly to the country's industrialization, and remains the main driver of export growth. More recently, services are gaining in importance. In addition, large flows of remittances have strengthened Bangladesh's external position. This positive economic performance has been accompanied by a decline in poverty, but the COVID-19 pandemic and the war in Ukraine have interrupted the country's long period of robust economic growth, deepening existing

vulnerabilities. In the wake of the pandemic, in 2022 Bangladesh experienced stagnating job growth, rising inequality and a slowing down in the rate of poverty reduction. In 2023, negative effects from the war in Ukraine have led to a considerable widening of Bangladesh's current account deficit, depreciation of its currency, the Bangladeshi taka, and a decline in foreign exchange reserves, all of which are hampering recovery from the pandemic, with revenues remaining low and financial sector vulnerabilities high (IMF, 2023; UNCTAD, 2019b).

In 2021, Bangladesh was recommended for graduation from the LDC category with the expectation that the country would graduate in 2026.²⁹ There are

²⁹ See <https://www.un.org/ldcportal/content/bangladesh-graduation-status>.

four lingering sources of vulnerability that will continue to shape the country's trajectory towards graduation and beyond: (i) a reliance on LDC-specific preferential market access for low-skill garment exports; (ii) insufficient export diversification; (iii) dependence on migrant remittances for capital accumulation; and (iv) vulnerability to climate change (UNCTAD, 2022c).

Industrial policy has been at the core of economic policymaking since the 1980s, when the Government of Bangladesh developed its first industrial plan. Industrial policy tools used by Bangladesh include subsidies, discounted interest rates, import tariffs, tax rebates for research and development, public procurement rules and targeted public investment (Roy, 2017; UNCTAD, 2022c). However, Bangladesh's industrialization, like that of other Asian LDCs, is of a shallow form (UNCTAD, 2020). In particular, an overreliance on the ready-made garment sector renders the economy particularly vulnerable to external shocks.

Bangladesh is vulnerable to both disasters and climate change, and ranked the seventh extreme disaster risk-prone country in the world in the Global Climate Risk Index 2021. Its economic performance is highly susceptible to the growing severity and frequency of climate-related events, such as riverine floods, flash floods, storm surges and cyclones, due to the country's high proportion of low-lying inhabited coastland areas, and the population's continued reliance on climate-sensitive sectors, such as agriculture and fisheries (UNCTAD, 2022c). Women in Bangladesh are disproportionately affected by the loss of natural resources due to the prevalent practice of men moving out of coastal areas in search of livelihoods (Chowdhury et al., 2022).

Given its high vulnerability to climate change, Bangladesh has a long history of engaging in adaptation, and has produced a number of action plans: the National Adaptation Programme of Action (NAPA), first published in 2005 (updated in 2009), the National Adaptation Plan of Bangladesh (2023–2050) released in 2022, and the Bangladesh Climate Change Strategy and Action Plan released in 2009 and updated in 2022 (Bangladesh, Ministry of Environment, Forest and Climate Change, 2022). Bangladesh also has the ambition to achieve a substantial reduction in its emissions, in line with its nationally determined contributions (NDC). Mitigation plans include a focus on supporting renewable energy projects, improving the efficiency of existing power plants, reducing deforestation, enhancing the use of solar energy in agriculture and improving waste management (Government of the People's Republic of Bangladesh, 2022).

Bangladesh is considered among the global leaders in climate central banking

Financial system and use of climate tools by Bangladesh Bank

The broad vision of Bangladesh Bank is to maintain price and financial stability, and to support inclusive economic growth, employment creation and poverty reduction. Bangladesh Bank also has as an explicit target to support socially responsible and environmentally sustainable development initiatives. This suggests that it is in a position to consider all the climate central banking tools discussed in section D.

The financial system of Bangladesh is predominantly bank-based; the presence of non-bank financial institutions (NBFIs) is relatively limited (Habib, 2019).³⁰ Among NBFIs, microfinance institutions have a long history dating back to the 1970s (Mia et al., 2019). By 2013, the significant expansion of microcredit in Bangladesh meant at least 60 per cent of rural households had received microcredit at least once in their lifetime (Osmani, 2016). According to Bangladesh Bank (2022),³¹ there are 61 banks in the scheduled bank category (State-owned commercial banks, specialized banks, several types of private commercial banks and foreign commercial banks), of which 34 are NBFIs – mostly private domestic or joint-venture initiatives. The bond market in Bangladesh remains underdeveloped. A traditional weakness of the Bangladesh financial system is the high proportion of non-performing loans, particularly high in specialized banks and State-owned commercial banks. While Bangladesh has taken steps to adopt some elements of Basel III that could address financial stability issues, it applies numerous exceptions (Habib, 2019; IMF, 2023).

Bangladesh is considered among the global leaders in climate central banking, having gained global

³⁰ Bangladesh Bank classifies the financial system into (i) the formal financial sector, which comprises all regulated institutions, such as banks, NBFIs and micro finance institutions; (ii) the semi-formal financial sector, which comprises institutions that are regulated but do not fall under the jurisdiction of the Bangladesh Bank and; (iii) the informal financial sector, which comprises private financial intermediaries that are completely unregulated (see <https://www.bb.org.bd/en/index.php/financialactivity/index>).

³¹ <https://www.bb.org.bd/en/index.php/financialactivity/bankfi>.

Special attention should be given to types of microcredit that could result in maladaptation

recognition for being an early promoter of climate finance (Khairunnessa et al., 2021; Bose et al., 2021; IFC, 2018). In 2011 it issued the Environmental Risk Management (ERM) Guidelines for Banks and Financial Institutions (updated in 2017), which are a form of green financial supervision. The banks were instructed to support climate mitigation in several phases. They were asked to, inter alia, (i) establish a separate green banking unit, (ii) create supervisory committees to monitor progress on the support of green activities and allocate budgets for green finance, (iii) formulate sector-specific green financial policies, and (iv) publish reports on green activities using standardized formats.

Bangladesh Bank has also used green credit controls. Since 2016, it has set a 5 per cent minimum target of direct green finance in the total funded loan disbursements/investments of financial institutions.³² Green finance refers to loans for projects involving renewable energy, energy efficiency, alternative energy, liquid waste management and solid waste management (Bangladesh Bank, 2022). In addition, banks have been instructed to establish a climate risk fund, and allocate at least 10 per cent of their corporate social responsibility budget to that fund. The Bank of Bangladesh has also taken measures to green its own portfolio: it has established a 2 billion Bangladeshi taka revolving refinancing scheme from its own funds to support projects on solar energy, biogas and an effluent treatment plant (Khairunnessa et al., 2021).³³

Options for the future

Bangladesh exemplifies how central bank climate action can support industrial policy objectives. By directing credit to specific activities that support climate mitigation and assessing banks based on the financing they provide to green initiatives, Bangladesh Bank supports the industrial policy targets of the Government towards a green transition. For example, it is a high priority for the ready-made garment sector to reduce its environmental footprint. This is important not only because of national environmental targets, but also because, in order to maintain a high

share in global export markets, that sector needs to satisfy global environmental standards (Rab and Hoque, 2017). By offering better financing conditions to ready-made garment companies that improve resource efficiency, adopt energy and chemical waste management policies and other environmental initiatives, the banking sector can support the country's low-carbon transition.

However, the limitations of green finance initiatives need to be explicitly considered. Over-indebtedness and higher default rates for companies that engage in green activities are some potential side effects of green credit controls. For 2023, the private sector's stock of credit as a proportion of GDP is estimated to be close to 45 per cent, up from 39 per cent in 2022 (table 4.1). Therefore, Bangladesh Bank needs to carefully consider how climate mitigation tools could be designed in a way that does not further increase private sector indebtedness and the potential for defaults. An additional significant challenge to the promotion of green finance is that the perceived credit risk of green loans is typically high. This discourages the banking sector from providing more green finance.

So far, most climate initiatives of Bangladesh Bank have targeted climate mitigation, with climate adaptation relatively neglected. Given that Bangladesh is highly vulnerable to climate change impacts, more emphasis could be placed on the development and use of central bank tools for climate adaptation. This could include the specific incorporation of climate adaptation into financial supervision reporting, and the use of explicit climate adaptation targets in credit controls. The development benefits of climate adaptation tools will be enhanced if more support is given to dual-use adaptation investments (Khan et al., 2020). The sustainable finance taxonomy that is currently under development (Bangladesh Bank, 2022) is expected to strengthen the effectiveness of both climate mitigation and climate adaptation tools.

Special attention should also be given to the fact that poor people in several climate vulnerable rural areas in Bangladesh, whose livelihoods have been disrupted by climate-related events, borrow from informal moneylenders, often at usurious interest rates. This type of microcredit could result in maladaptation, whereby over-indebtedness undermines the ability of vulnerable populations to respond effectively to climate change (Jordan, 2021).

Bangladesh Bank could also more explicitly consider incorporating climate risk transmission channels into its analytical frameworks, which would improve the conceptual understanding of the macrofinancial effects of transition and physical risks, as well as

³² In 2020, it also set a 5 per cent green finance target for total funded term loan disbursements/investments.

³³ For a chronological summary of the green finance initiatives of Bangladesh Bank, see Bangladesh Bank, 2022.

its macroeconomic projections. For instance, given that four of the top five export partners of Bangladesh are in Europe (see table 4.1), Bangladesh Bank needs to understand how the country's exports – and hence, macroeconomic and financial stability – could be affected by the implementation of the European Union's Green Deal policies. Of particular importance for Bangladesh Bank is to also improve its understanding of how the transmission mechanisms of macroeconomic and financial policies can be affected by climate events. Accordingly, the Bank could set as a medium-term target the running of some climate stress testing exercises that would analyse in a more integrated way the risks related to both global and domestic climate-related developments.

b. Zambia

Economic environment and climate change

Zambia is a resource-based economy, with a copper mining industry dating back to the 1920s. In 2021, ores and metals accounted for 73 per cent of the country's total exports (table 4.1). Zambia's copper mining accounts for more than 2 per cent of global copper production, and the performance of its copper mining industry has a considerable impact on overall trends in Zambia's GDP, foreign direct investment, exports and government revenues. Zambia's financial position is thus highly susceptible to fluctuations in global market prices and demand for copper. The COVID-19 pandemic led to a sharp fall in the price of copper, precipitating the country's default on its external debt in November 2020 (UNCTAD, 2022b; AfDB, 2021a). In August 2022, the IMF approved a loan of \$1.3 billion to the country under a 38-month arrangement that obliges Zambia to implement austerity measures and several fiscal policy and institutional reforms (IMF, 2022).

The country has achieved socioeconomic progress and met the criteria for graduation from LDC status for the first time in 2021.³⁴ However, vulnerabilities persist in terms of structural transformation. For instance, manufacturing value added as percentage of GDP witnessed sharp declines between 2004 and 2013, and after a brief recovery, resumed a declining trend in 2017 (UNCTAD, 2022b). Zambia's manufacturing sector is characterized by limited diversification, low levels of investment and the prevalence of outdated technologies (Zambia, Ministry of Commerce, Trade and Industry, 2018). Priority sectors in Zambia's industrial policy are processed foods, textiles and garments, engineering

³⁴ <https://www.un.org/ldcportal/content/zambia-graduation-status>.

The growing demand for copper poses environmental and social risks for Zambia

products, wood and wood products, leather and leather products, mineral processing and products, pharmaceuticals, and the blue economy. At the core of the industrial policy is the provision of low-cost financing, which is expected to be provided mainly by the private sector and the Development Bank of Zambia (Government of Zambia, 2018).

Zambia has the potential to benefit from the growing global demand for renewable energy technologies, since copper plays a key role in the development of renewable energy systems and is an essential material component of electric vehicles. However, the growing demand for copper also poses environmental and social risks, and Zambia could suffer from the vagaries of green extractivism (UNCTAD, 2022a).

Zambia's 2016 NDC³⁵ (with commitments updated in 2022) stated that climate variability and change had become a major threat to sustainable development in the country, and that its commitments were contingent on external financial support. Indeed, Zambia has experienced increased frequency and severity of drought and flooding, with adverse consequences for food and water security. The effects of climate change on agriculture, transport infrastructure and electricity generation (predominantly hydro power) constitute a particular challenge for the Zambian economy (UNCTAD, 2022b; Hunter et al., 2020; Tembo et al., 2020).

Financial system and the role of the Bank of Zambia

The rise of non-performing loans in the wake of the COVID-19 pandemic places the domestic financial system under considerable pressure. Non-performing loans continue to be highest in the agricultural, forestry, fisheries and hunting sectors. Foreign banks dominate the banking sector, with the proportion of assets of their subsidiaries in total assets of the banking sector higher than 70 per cent during the period 2018–2020 (Bank of Zambia, 2020a). Local private banks and those partially owned by the Government, account for the remainder of assets. Microfinance institutions (the majority of which were established in the early 2000s) constitute the formal non-bank financial sector (Bank of Zambia, 2020a). However, their lending remains limited, and is

³⁵ <https://unfccc.int/documents/498042>.

The Bank of Zambia is one of three main regulators of the financial system

directed mainly to rural agricultural households. The collapse of several microfinance institutions in the past has contributed to the underdevelopment of the microfinance sector (Agri-ProFocus Zambia, 2014).

The Bank of Zambia is one of three main regulators of the financial system. It is responsible for the regulation and supervision of banks and other financial service institutions, while the Securities and Exchange Commission (SEC) and the Pensions and Insurance Authorities (PIA) are responsible for supervising and regulating the capital markets and the pension/insurance industry, respectively.³⁶ The Bank of Zambia is now in the process of strengthening its microprudential and macroprudential supervision. For example, it is currently undertaking macroprudential stress tests, for which it aims to use supervisory technologies (SupTechs). It also intends to develop a microprudential stress testing framework. In addition, it is customizing the Basel III liquidity requirements, and plans to establish and operationalize a Financial Stability Committee (Bank of Zambia, 2020b). Strengthening the financial supervisory capacity of the Bank is part of the recent agreement of the country's authorities with the IMF. In the context of this agreement, steps have also been taken to make the Bank of Zambia operationally independent (IMF, 2022).

The primary objective of the Bank of Zambia is the achievement and maintenance of price and financial stability with the aim of supporting sustainable development. To achieve this objective, the Bank uses several monetary and financial policy tools. These include reserve requirements, credit controls, lending facilities, open market operations and prudential guidelines. Moreover, by selling and buying foreign exchange reserves, the Bank aims to keep the exchange rate at levels that help maintain stability.³⁷ In April 2020, the Bank of Zambia introduced the Targeted Medium-Term Refinancing Facility (TMTRF) aimed mainly at supporting the liquidity of the financial sector during the COVID-19 crisis, and encouraging lending to non-financial corporations and households. The facility has specifically targeted the agricultural,

manufacturing, energy and tourism sectors (Bank of Zambia, 2020a).

Possibilities for the Bank of Zambia to use climate tools

The Bank of Zambia's mandate refers explicitly to the maintenance of price and financial stability. In line with the decision map presented in figure 4.4, the Bank could consider developing climate-adjusted analytical frameworks and using climate risk exposures tools. For example, it could start by developing forward-looking macroeconomic projections that capture the macrofinancial risks and opportunities that arise from the global transition to low-carbon technologies, with a special emphasis on the increasing demand for copper (see table 4.1). The monetary authorities of Zambia need to pay particular attention to climate-related developments in Zambia that have the potential to create both opportunities (e.g. higher demand for copper) and risks (e.g. green extractivism). The Bank could also incorporate climate change in stress testing exercises.

The use of climate mitigation and adaptation tools might be more controversial and less straightforward, given the Bank of Zambia's narrowly defined legal mandate. The Bank aims to support sustainable development, but only through the maintenance of price and financial stability, and not directly. The recent agreement with the IMF to make the Bank of Zambia operationally independent³⁸ may complicate eventual attempts by the Bank to directly support climate mitigation and adaptation targets.

Should the Government at some point decide to make climate-aligned development an explicit target³⁹ of the Bank of Zambia, there are several tools at the Bank's disposal that would allow it to do so. Given Zambia's high vulnerability to climate change and very low contribution to global cumulative emissions, it would be desirable for such tools to be adjusted in order to focus primarily on climate adaptation. For instance, through the use of credit allocation policies, specific minimum targets could be set prioritizing the provision of credit to climate adaptation projects. In this context, the TMTRF could be used to encourage the provision of credit to companies and households that can use it to further national adaptation plans, or reserve requirements could be lowered for

³⁸ See <https://www.imf.org/en/News/Articles/2021/12/06/pr21359-zambia-imf-staff-reaches-staff-level-agreement-on-ecf>.

³⁹ It is notable that as part of its vision and mission, the Bank aims "To be a dynamic and credible central bank that contributes to the economic development of Zambia" and "To achieve and maintain price and financial system stability to foster sustainable economic development".

³⁶ See <https://www.boz.zm/financial-sector-development.htm>.

³⁷ See <https://www.boz.zm/monetary-policy-instruments.htm>.

those banks that increase their financing of climate adaptation investment. In order for these tools to be effective, special emphasis should be placed on the development of Zambian context-specific criteria for the classification of climate adaptation activities.

c. Madagascar

Economic environment and climate change

The economy of Madagascar is largely agrarian. Agriculture and fisheries play a prominent role in the economy, whereas the contribution of manufacturing is less than 10 per cent of GDP (see table 4.1). Despite considerable natural resources, the country has one of the world's highest poverty rates,⁴⁰ which have been exacerbated by the impacts of the COVID-19 pandemic and the inflationary effects of the war in Ukraine. Madagascar is among six LDCs that posted an overall decline in total wealth per capita during the period 1995–2014, raising serious sustainability concerns (UNCTAD, 2021b; AfDB, 2021b). The manufacturing, mining and services sectors were the worst affected by the COVID-19 pandemic, leading to negative economic growth and a deterioration in the fiscal deficit, reversing the trend of improved economic performance since 2015 (AfDB, 2021a; 2022). Economic progress is hampered by low structural transformation, high vulnerability to external shocks (including multiple climatic and trade shocks) that contribute to a history of sharp growth contractions, the lack of employment opportunities, and a decline in the productivity of private enterprises in recent years.

Madagascar has an extensive coastline, which makes its coastal zones particularly vulnerable to climate change. Climate change is also affecting the country's exceptional biodiversity. The agricultural sector has historically borne the brunt of cyclones and droughts, with adverse impacts on soil fertility, water resources and economic and social infrastructure. It is expected that global warming will intensify cyclones, increase rainfall in most parts of the country and worsen coastal erosion (Madagascar, Presidency, 2015). The capital city is particularly exposed to flooding, and suffers from a shortage of water supply, as well as poor sewerage and drainage infrastructure (Global Center on Adaptation, 2022).

Madagascar formulated its National Climate Change Policy in 2010, which aims to increase its resilience to climate change (World Bank et al., 2021). According

⁴⁰ Estimated at above 80 per cent (see <https://www.imf.org/en/Publications/CR/Issues/2023/03/21/Republic-of-Madagascar-2022-Article-IV-Consultation-Third-Review-Under-The-Extended-Credit-531196>).

Prior to 2014, active use of monetary policy in Madagascar was absent

to Madagascar's intended nationally determined contribution (INDC),⁴¹ climate mitigation efforts will focus, among other things, on renewable energy, rural electrification and the implementation of climate-smart agriculture, including the reduction of forest timber extraction and production of biogas from waste water. Adaptation plans also target improved management of water resources, restoration of natural habitats and the use of resilient agriculture integrated models. Climate adaptation efforts are giving particular emphasis to the development of early warning systems for cyclones, droughts, floods and other climate-related events (World Bank et al., 2021).

Financial system and the role of the Central Bank of Madagascar

The Malagasy financial system primarily consists of banks and microfinance institutions, with a limited number of pension funds and insurance companies. The vast majority of banks are subsidiaries of foreign banks (IMF, 2016; 2020). Crucially, a large proportion of the population has no access to financial services.⁴² Lending by microfinance institutions that service poor households is restricted by the existence of low credit ceilings (IMF, 2016). In 2020, the private credit-to-GDP ratio was very low, at about 16 per cent (see table 4.1).

Prior to 2014, there was no active use of monetary policy, but in recent years the Central Bank of Madagascar (BFM)⁴³ has gradually assumed an important role in the management of bank liquidity (IMF, 2020). The BFM's mandate is to ensure the internal and external stability of the currency.⁴⁴ The ultimate aim of monetary policy is to control the inflation rate. The BFM uses three key tools for this purpose: it maintains an interest rate corridor system, with an upper limit for the interest rate on marginal lending facilities and a lower limit for the interest rate on deposit facilities; it operates mandatory reserve requirements for financial intermediaries to prevent excessive credit expansion; and its interventions in the money market encompass refinancing operations and

⁴¹ <https://unfccc.int/NDCREG>.

⁴² See <https://www.findevgateway.org/country/financial-inclusion-in-madagascar>.

⁴³ Banky Foiben'i Madagasikara.

⁴⁴ See <https://www.banky-foibe.mg/politique-monetaire-2>.

liquidity withdrawals. The IMF has recommended the introduction of a regulatory framework for repurchase operations (repos) that would enhance longer term interbank lending, along with the development of a bond market (IMF, 2020).

Can the central bank use climate tools?

Based on its mission to maintain price stability and exchange rate stability, the BFM needs to have an integrated understanding of how the external macroeconomic environment is shifting because of climate change. Since the country is very susceptible to external factors, the BFM needs to develop a climate-adjusted analytical framework that will allow it to understand (i) how global climate policies will affect its main export partners (see table 4.1), (ii) how the economy of Madagascar will be affected by climate events, and (iii) how climate change might impair the effectiveness of the BFM's monetary policy tools. Regarding the latter, global and national climate-related supply shocks might, for instance, create inflationary pressures that could reduce the effectiveness of the interest rate corridor system.

However, since financial supervision by the BFM is weak at present (IMF, 2020), any use of climate risk exposure tools might be premature. Should financial supervision and regulation be strengthened in the future, the BFM could consider running some climate stress tests to evaluate the vulnerability of the Malagasy financial system to transition and physical risks. Should the Government decide to identify sustainable development as a primary or secondary mandate of the BFM, the use of some climate adaptation tools could be contemplated. For example, the BFM could link reserve requirements with the proportion of climate adaptation loans in the total loans of banks and microfinance institutions. In addition, some minimum credit targets could be set for the provision of climate adaptation loans in order to further national goals on climate adaptation.

2. Policy lessons from country case studies

The following key policy lessons may be drawn from the country case studies:

- The central banks of LDCs should contemplate the use of central banking climate mitigation and adaptation tools only if the following conditions are met: (i) sustainable development or a strong macroprudential approach are part of their mandates; and (ii) their financial systems are sufficiently developed and used by a sufficiently large proportion of the population and the non-financial corporate sector. Both these

conditions hold in the case of Bangladesh, but not in the case of Madagascar.

- Conditions (i) and (ii) are necessary, but not sufficient for justifying the use of climate central banking tools. For example, climate tools cannot be successful without the prior development of specific green and adaptation criteria/taxonomies. Climate tools can also have adverse effects, if, for example, they lead to over-indebtedness and defaults. Such side effects of climate central banking tools need to be seriously considered before central banks can consider introducing climate initiatives.
- If climate tools are introduced by LDCs' central banks, it is essential for them to be aligned with national targets of industrial and fiscal policy. For example, if the Bank of Zambia decides to use climate tools, it needs to first make sure that the financial system will continue to support the priority sectors that have been identified by the national industrial policy. Moreover, if there are explicit green targets in a country's industrial policy, any climate-related adjustments of monetary and financial tools should support those targets.

Climate central banking should align with industrial policy to foster green structural transformation



- Central banks in LDCs, regardless of their mandate, need to develop analytical frameworks that allow them to identify how exposed their financial systems and macroeconomies are to risks that might stem from the implementation of climate policies in other countries (especially their export partners), and from climate-related physical events. This is important information that should also be shared with government authorities for the planning and management of green structural transformation and the low-carbon transition.

- Central banks in LDCs will require assistance from the international community to acquire the necessary technical and financial resources to deploy climate central banking tools. Even in the case of Bangladesh, which is among global leaders in the application of such tools, the apparent mitigation bias in its use of the tools points to deficiencies in institutional capacity in the face of already evident and increasing damage from climate change in the country. Accordingly, one way in which multilateral development banks could make a meaningful contribution to climate central banking in LDCs is to prioritize a focus on the development of domestic financial systems that operate in a transparent manner to ensure that necessary ecosystem gaps are plugged as quickly as possible, and that data/information becomes readily available for monitoring financial alignment targets and the use of related tools.

G. Conclusions

There is an ongoing global debate on how the financial system can be reformed to contribute to the transition to a low-carbon economy. The conventional view takes a static, risk-based approach to aligning financial flows to net-zero commitments. This chapter argues that a green transition-oriented approach to financial alignment in LDCs has the highest probability of fostering green structural transformation and developmental progress in these countries.

The chapter has focused on the role that central banks in LDCs could play in fostering the alignment of their domestic financial systems with global goals for climate action. It identifies three types of climate central banking tools and a two-step process based on the understanding that one size does not fit all when it comes to climate central banking. It serves to guide central banks through the process of determining under what conditions central banks in LDCs should contemplate engaging in climate central banking, and how they may select specific tools through which to implement climate-related mandates. The importance of the “one-size-does-not-fit-all” approach is unambiguously illustrated by the three country case studies. It is also evident that, even in cases where central bank mandates in LDCs do not allow a direct engagement with climate central

It is a necessity for central banks of LDCs to use climate-adjusted analytical frameworks

banking tools, the need for those banks to use climate-adjusted analytical frameworks is no longer a matter of choice but one of a necessity. This is because of the growing importance of physical and transition effects in the new climate-related macroeconomic environment of LDCs. For example, the Bank of Zambia might not yet be able to use central banking tools for achieving climate targets. However, it would benefit from the development of climate-adjusted analytical frameworks and the use of some climate risk exposure tools. Similarly in the case of Madagascar’s central bank, the development of climate-adjusted analytical frameworks would be beneficial, given the high climate-induced risks that the country is facing, even though the use of climate central banking tools would be premature because of the low level of financial sector development in that country.

Addressing climate challenges in LDCs requires fundamental structural transformations driven by governments. Central banks can only play a supportive role in this process, and that role requires them to transition from a technocratic to a developmental role. A key and unavoidable requirement for the adoption of central banking tools for climate mitigation and adaptation is thus the coordination of central banks with fiscal and regulatory authorities. This is of particular importance for maximizing the beneficial effects of those tools for climate-aligned development, and financial stability generally, but more so in LDCs, which must concurrently target low-carbon transition and structural transformation in a manner that is synergistic and transformative.

More fundamentally, the conditions for averting an unjust transition in LDCs will not be achieved through the alignment of domestic financial systems alone. Such an alignment should be undertaken as part of a broader reform of the international financial architecture, which will require important complementary and concerted actions at the international level.

Annex

Annex table A4.1

Development mandates of central banks in least developed countries

LDC REGIONAL GROUP: African LDCs and Haiti			
Country	Central Bank	Legal Development Mandate	Text
Angola	Banco Nacional de Angola	Yes, subordinate	The National Bank of Angola, as the central and issuing bank, ensures the preservation of the value of the national currency and participates in the definition of monetary, financial, and foreign exchange policies. Without prejudice to the provision of the above objective, it is the responsibility of the National Bank of Angola to execute, monitor, and control monetary, foreign exchange, and credit policies, manage the payment system, and administer the circulating medium within the scope of the country's economic policy.
Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo	Central Bank of West African States	Yes	The prime purpose of the Central Bank's monetary policy shall be to ensure price stability. The Monetary Policy Committee shall set the inflation target. This purpose notwithstanding, the Central Bank shall provide support for the economic policies of the West African Economic and Monetary Union (WAEMU), to ensure sound and sustainable growth.
Burundi	Banque de la République du Burundi	Yes, subordinate	The main objective of the central bank is to ensure price stability. Without prejudice to the preceding objective, the central bank contributes to the stability of the financial system. While prioritizing the aforementioned two objectives, the central bank also contributes to the implementation of economic policies conducive to macroeconomic stability and the harmonious development of the country.
Central African Republic, Chad	Banque des États de l'Afrique Centrale, BEAC	Yes, subordinate	The mandate of the Central Bank of Central African States (BEAC) is to ensure the stability of the currency. Without prejudice to this objective, the BEAC supports the general economic policies formulated by the member states of the monetary union.
Comoros	Banque Centrale des Comores	Yes, subordinate	The Bank is the sole monetary authority of the Comoros. The Bank guarantees the stability of the currency of the Comoros. Without prejudice to this objective, it supports the economic policy of the Comoros. The Bank defines and implements the monetary policy of the Comoros. It holds and manages the gold reserves and the foreign exchange reserves of the Comoros. These gold reserves and these reserves are recorded as assets on its balance sheet.
Democratic Republic of the Congo	Banque Centrale du Congo	Yes, subordinate	The Bank is tasked with defining and implementing the monetary policy of the country, the main objective of which is to ensure the stability of the general level of prices. It is independent in the achievement of this objective. To this end, the Bank, through its Board, whether in the person of the Governor or any other member of its decision-making bodies, must not take any action that could compromise this independence. Without prejudice to the main objective of stability of the general level of prices, the Bank supports the general economic policy of the Government
Djibouti	Banque Centrale de Djibouti	Yes	The central bank's general mission is to ensure the stability of the national currency and the smooth functioning of the banking and financial system. Other contributions: The central bank lends its support to the implementation of the state's economic policy. In this context, it can propose to the government any measure that is likely to have a positive impact on the economic and social development of the country.
Eritrea	Bank of Eritrea	Yes	The principal objective of the Bank shall be to manage money and credit in the Eritrean economy, subject to the provisions of this Proclamation, with the purpose of safeguarding the value of the national currency. More specifically: (1) the Bank shall: (a) pursue stability in prices in Eritrea (b) maintain sound exchange rate policy to promote a healthy balance of payments and a sustainable foreign exchange reserve position; and (c) foster economic growth, employment and overall development in the country; (2) the Bank shall promote the establishment of payment systems to facilitate the execution of domestic and foreign payment transactions; and (3) the Bank shall promote a sound financial system in the country in accordance with the nation's financial laws and prudential guidelines.
Ethiopia	National Bank of Ethiopia	Yes	Maintain price and exchange rate stability, foster sound financial system and contribute for the rapid and sustainable economic development of Ethiopia

LDC REGIONAL GROUP: African LDCs and Haiti			
Country	Central Bank	Legal Development Mandate	Text
Gambia	Central Bank of the Gambia	Yes, subordinate	(1) The primary objects of the Bank are to (a) Achieve and maintain domestic price stability; (b) Promote and maintain the stability of the currency of the Gambia (c) Direct and regulate the financial, insurance, banking and currency system, in the interest of the economic development of the Gambia; and (d) Encourage and promote economic development and the efficient utilization of the resources of the Gambia through the effective and efficient operation of a financial system. (2) Without prejudice to sub-section (1), the Bank shall: (a) Support the general economic policy of the Government; and (b) Promote economic growth and the effective and efficient operation of a financial system in the Gambia.
Guinea	La Banque Centrale de la République de Guinée	Yes, subordinate	The main objective of the Central Bank is to ensure price stability. The inflation target is defined by the Monetary Policy Committee. Without prejudice to this objective, the Central Bank lends its support to the general economic policy of the Government of Guinea with a view to healthy and sustainable economic growth.
Haiti	Banque de la République d'Haïti	No	The legislation in force assigns four fundamental roles to the BRH, which can be stated as follows: defend the internal and external value of the national currency; ensure the efficiency, development and integrity of the payments system; ensuring the stability of the financial system; act as the state's banker, cashier and fiscal agent.
Lesotho	Banka e Kholo ea Lesotho	No	The objective of the Bank is to achieve and maintain price stability. 6. The functions of the Bank shall be: (a) to foster the liquidity, solvency and proper functioning of a stable market-based financial system; (b) to issue, manage and redeem the currency of Lesotho; (c) to formulate, adopt and execute the monetary policy of Lesotho; (d) to formulate, adopt and execute the foreign exchange policy of Lesotho; (e) to license or register and supervise institutions pursuant to the Financial Institutions Act 1999, the Money Lenders Act 1989, the Building Finance Institutions Act 1976, and the Insurance Act 1976; (f) to own, hold and manage its official international reserves; (g) to act as banker and adviser to, and as fiscal agent of, the Government of Lesotho; (h) to promote the efficient operation of the payments system; (i) to promote the safe and sound development of the financial system; and (j) to monitor and regulate the capital market.
Liberia	Central Bank of Liberia	Yes	The principal objective of the Central Bank shall be to achieve and maintain price stability in the Liberian economy. To this end, it shall devise and pursue policies designed to: a. preserve the purchasing power of the national currency; b. promote internal and external equilibrium in the national economy; c. encourage the mobilization of domestic and foreign savings and their efficient allocation for productive economic activities; d. facilitate the emergence of financial and capital markets that are capable of responding to the needs of the national economy; and e. foster monetary, credit and financial conditions conducive to orderly, balanced and sustained economic growth and development.
Madagascar	Banky Foiben'i Madagasikara	Yes, subordinate	The primary objective of the Central Bank is to ensure internal and external stability of the currency. Without prejudice to this primary objective, the Central Bank contributes to the financial stability and the soundness of the financial system of Madagascar.

LDC REGIONAL GROUP: **African LDCs and Haiti**

Country	Central Bank	Legal Development Mandate	Text
Malawi	Reserve Bank of Malawi	No	(1) The primary objectives of the Bank shall be to maintain price and financial stability. (2) In case of conflict between price and financial stability, the price stability objective shall take precedence. Website: The bank shall complement general economic development in Malawi. Vision: To be a central bank of excellence that promotes macroeconomic stability for sustainable economic development in Malawi
Mauritania	Banque Centrale de Mauritanie	Yes, subordinate	The main objective of the Central Bank is to maintain price stability. Without prejudice to the objective of price stability, the Central Bank pursues the stability of the financial system and contributes to the implementation of the general economic policies defined by the Government.
Mozambique	Banco de Moçambique	Yes	1. The main objective of the Bank shall be to preserve the value of the national currency. 2. In light of said currency preservation, the Bank shall also undertake the following: a) promote the conduct of sound monetary policy; b) guide credit policy with a view to promoting the economic and social growth and development of the country; c) manage foreign assets so as to maintain an adequate volume of means of payment necessary for international trade d) discipline banking activity; 3. In the pursuit of the objectives set out in paragraphs 1 and 2 of this Article, the Bank shall observe Government policies.
Rwanda	National Bank of Rwanda	Yes	The general mission of NBR is to ensure price stability and sound financial system. In particular, NBR has the following responsibilities: 1. to define and implement the monetary policy; 2. to organise, supervise and coordinate the foreign exchange market 3. to supervise and regulate the activities of financial institutions notably banks, micro finance institutions, non-deposit taking lending institutions, finance-lease institutions, insurance institutions, social security institutions, pension funds/schemes institutions, discount houses and other financial services providers that are not supervised by any other institution under specific laws; 4. to supervise and regulate payment systems; 5. to conduct a financial stability assessment for sustaining economic growth and development; 6. to formulate and implement policies to promote the establishment of regulations and the supervision of efficient and effective clearing and settlement payment systems; 7. to issue and manage currency; 8. to hold and manage official foreign exchange reserves; 9. to act as State Cashier; 10. to collect, compile, disseminate monetary and related financial statistics on a timely basis; 11. to follow up and promote the soundness of financial institutions and their compliance with governing laws including Law on preventing and opinion of NBR on the status of currency, access on credit and the economy in general is particularly sought in the event the Government needs to take monetary or financial measure.
Sierra Leone	Bank of Sierra Leone	Yes	The objective of the Bank shall be to (a) issue and manage the currency of Sierra Leone (b) achieve and maintain price stability (c) contribute to fostering and maintaining a stable financial system; and (d) support the general economic policy of the Government.
Somalia	Bankiga Dhexe Ee Soomaaliya	Yes, subordinate	1. The primary objective of the Bank shall be to achieve and to maintain domestic price stability. 2. The other objective of the Bank, which shall be subordinated to the primary objective of the Bank, shall be to foster and maintain a stable and competitive market-based financial system. 3. Without prejudice to these two objectives, the Bank shall support the general economic policies of the Government.

LDC REGIONAL GROUP: African LDCs and Haiti			
Country	Central Bank	Legal Development Mandate	Text
South Sudan	Bank of South Sudan	Yes, subordinate	<p>(1) The primary objective of the Bank shall be to maintain monetary and domestic price stability.</p> <p>(2) The other objectives of the Bank, which shall be subordinated to the primary objective of the Bank, shall be to foster the liquidity, solvency and effective functioning of a stable market based financial system, and to promote a safe, sound and efficient national payment system which aims to maintain the stability of the financial system as a whole.</p> <p>(3) Without prejudice to its primary objectives, the Bank shall support the general economic policies of the Government, and promote sustainable economic growth</p>
Sudan	Bank of Sudan	Yes	<p>The Bank shall have the following objects, to:</p> <p>(a) issue currency of the types thereof, organize, control and supervise the same;</p> <p>(b) lay down monetary and financing policies and implement the same, in such a way, as may achieve the national objectives of the national macro economy, in consultation with the minister;</p> <p>(c) organize banking business, monitor and supervise, strive to promote and develop and raise the efficiency thereof, in such way, as may achieve the balanced economic and social development;</p> <p>(d) strive to achieve economic stability and the stability of the par value of the Sudanese Pound;</p> <p>(e) act, in its capacity as the Government banker, as an advisor and agent thereof, in the monetary and financial affairs;</p> <p>(f) abide, in the discharge thereby, of the duties, achievement of the objects, exercise of the powers thereof, by the ordinance of Islamic Sharia, in Islamic banking system, and conventional banking customs, in the conventional banking system.</p>
Uganda	Bank of Uganda	Yes	<p>(1) The functions of the bank shall be to formulate and implement monetary policy directed to economic objectives of achieving and maintaining economic stability.</p> <p>(2) Without prejudice to the generality of subsection (1), the bank shall:</p> <p>(a) maintain monetary stability;</p> <p>(b) maintain an external assets reserve;</p> <p>(c) issue currency notes and coins;</p> <p>(d) be the banker to the Government;</p> <p>(e) act as financial adviser to the Government and manager of public debt;</p> <p>(f) advise the Government on monetary policy as is provided under section 32(3);</p> <p>(g) where appropriate, act as agent in financial matters for the Government;</p> <p>(h) be the banker to financial institutions;</p> <p>(i) be the clearinghouse for cheques and other financial instruments for financial institutions;</p> <p>(j) supervise, regulate, control and discipline all financial institutions and pension funds institutions;</p> <p>(k) where appropriate, participate in the economic growth and development programmes.</p>
United Republic of Tanzania	Benki Kuu Ya Tanzania	No	<p>1) The principal functions of the Bank shall be to exercise the functions of a central bank and, without prejudice to the generality of the foregoing, to formulate, implement and be responsible for monetary policy, including exchange rate policy, to issue currency, to regulate and supervise banks and financial institutions including mortgage financing, development financing, lease financing, licencing and revocation of licences and to deal, hold and manage gold and foreign exchange reserves of the United Republic of Tanzania.</p> <p>(2) The Bank shall compile, analyse, and publish the monetary, financial, balance of payments statistics and other statistics covering various sectors of the national economy.</p> <p>(3) In the pursuit of its objectives and performance of its tasks, the Bank shall be autonomous and accountable as provided for under this Act.</p>
Zambia	Bank of Zambia	No	<p>(1) Subject to the Constitution, the additional function of the Bank is to formulate and implement monetary and supervisory policies, directed at achieving and maintaining price stability and financial stability.</p> <p>(2) Where it is considered that there is a conflict between price stability and financial stability referred to under subsection (1), price stability shall take precedence.</p>

LDC REGIONAL GROUP: Asian LDCs

Country	Central Bank	Legal Development Mandate	Text
Afghanistan	Da Afghanistan Bank	Yes, subordinate	<p>The primary objective of Da Afghanistan Bank shall be to achieve and to maintain domestic price stability.</p> <p>The other objectives of Da Afghanistan Bank, which shall be subordinated to the primary objective of Da Afghanistan Bank, shall be to foster the liquidity, solvency and effective functioning of a stable market based financial system, and to promote a safe, sound and efficient national payment system.</p> <p>Without prejudice to its primary objectives, Da Afghanistan Bank shall support the general economic policies of the State, and promote sustainable economic growth.</p>
Bangladesh	Bangladesh Bank	Yes	<p>Whereas, it is necessary to establish a central bank in Bangladesh to manage the monetary and credit system of Bangladesh with a view to stabilizing domestic monetary value and maintaining a competitive external par value of the Bangladesh Taka towards fostering growth and development of country's productive resources in the best national interest</p> <p><i>NOTE:</i> vision on website mentions supporting rapid broad based inclusive economic growth, employment generation and poverty eradication</p>
Bhutan	Royal Monetary Authority of Bhutan	Yes, subordinate	<p>The primary objective of the Authority shall be to formulate 7. and implement monetary policy with a view to achieving and maintaining price stability. 8. Without prejudice to the primary objective, the secondary objectives of the Authority shall be to formulate and apply financial regulations and prudential a) guidelines to ensure the stability and integrity of the financial system, as empowered by this Act or by any other Act; promote an efficient financial system comparable to b) international best practices; promote, supervise and, if necessary, operate national c) and international payment and settlement system including electronic transfer of funds by financial institutions, other entities and individuals; promote sound practices and good governance in the d) financial services industry to protect it against systemic risk; and e) Subject to the above, promote macro-economic stability and economic growth in Bhutan.</p> <p>Reinforcing stable and inclusive economic growth.</p>
Cambodia	National Bank of Cambodia	Yes	<p>The mission of the National Bank of Cambodia is to determine and direct the monetary policy aimed at maintaining price stability in order to facilitate economic development within the framework of Cambodia's economic and financial policy</p>
Lao People's Democratic Republic	Bank of the Lao People's Democratic Republic	Yes	<p>The Bank of the Lao People's Democratic Republic serves as the secretariat for the Government in monetary management stably, financial institution supervision soundly, and payment system development efficiently in order to support the national socio-economic development.</p> <p>The Bank of the Lao PDR implements duties as follows:</p> <ol style="list-style-type: none"> 1. to prepare draft of policy, strategy to propose for Government consideration; 2. to apply the policy and strategy into action plan and project of the Bank of the Lao PDR for implementation; 3. to prepare draft of new and amended law, presidential decree and governmental decree proposing for Government consideration; 4. to disseminate law and regulation relating to financial and banking to public; 5. to implement monetary policy by using appropriate monetary policy tool in each period circumstance; 6. to manage foreign exchange in compliance with law and regulation; 7. to maintain and manage foreign currency reserve; 8. to supervise and inspect operation of financial institution 7; 9. to supervise and inspect payment's instrument, mechanism and system for safety manner; 10. to open its own account and Government account in foreign central Bank, international financial institution and foreign financial institution; 11. to accept open account to the Government, financial institution and international organization; 12. to distribute, sale, buy and settle the Government bond and bond guaranteed by the Government as defined in the relevant regulation; 13. to provide the opinion for the Government on the foreign currency borrowing from domestic or foreign country; 14. to reconcile and analyze information on economic, financial, monetary and performance of financial institution in the domestic and abroad; 15. to represent for the Government in international financial organization, cooperate and sign agreement regarding to finance and monetary with foreign country and international financial organization base on Government assignment; 16. to form, amend, supervise and develop accounting system of the Bank of the Lao PDR and financial institution; 17. to coordinate and cooperate with other sectors concerned both domestic and abroad in order to ensure its harmonious performance; 18. to report on its performance and relevant outstanding economic issue to the Government regularly; 19. to perform other duties provided by law and regulation.

LDC REGIONAL GROUP: Asian LDCs			
Country	Central Bank	Legal Development Mandate	Text
Myanmar	Central Bank of Myanmar	Yes, subordinate	The main aim of the Central Bank shall be to achieve and maintain the domestic price stability. 6. The Central Bank shall, in accordance with its main aim, endeavor to attain the following objectives: (a) to achieve monetary stability; (b) to achieve financial system stability; (c) to develop efficient payments and settlement system, (d) to support the general economic policy of the Government conducive to the sustained economic development.
Nepal	Nepal Rastra Bank	Yes	To formulate necessary monetary and foreign exchange policies in order to maintain the stability of price and balance of payment for economic stability and sustainable development of economy, and manage it;
Yemen	Central Bank of Yemen	Yes	Monetary Policy: The Central Bank uses all monetary policy tools to control inflation, stabilizes exchange rates of the national currency and create the right climate for investment and growth.

Source: Central bank websites and government gazettes.

LDC REGIONAL GROUP: Island LDCs			
Country	Central Bank	Legal Development Mandate	Text
Kiribati	-	-	No central bank
Sao Tome and Principe	Banco Central de São Tomé e Príncipe	Yes	Mandate: As the central bank of Sao Tome and Principe, it is the bank's special responsibility, in accordance with the general orientation of the government, to formulate and execute in the areas of monetary, credit, interest, and exchange policies, the most appropriate policies, as well as to promote the monitoring of results. Website: The strategic objective of monetary policy is to maintain price stability, with a view to achieving macroeconomic balance and consequently promoting sustainable economic growth.
Solomon Islands	Central Bank of Solomon Islands	Yes, subordinate	(1) The primary objective of the Central Bank shall be to achieve and to maintain domestic price stability. (2) An additional objective of the Central Bank, which shall be subordinated to the primary objective, shall be to foster and to maintain a stable financial system. (3) Without prejudice to attainment of these two objectives, the Central Bank shall support the general economic policies of the Government.
Timor-Leste	Banco Central de Timor-Leste	Yes, subordinate	The Bank's main purpose is to achieve and maintain internal price stability. In addition to the above, the Bank shall foster and maintain a stable and competitive system based on free market principles. Without prejudice to the previous articles, the Bank shall support the Government's general economic policies.
Tuvalu	-	-	No central bank

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