

— KEYS TO —
CLIMATE
ACTION

How Developing Countries
Could Drive Global Success
and Local Prosperity



Amar Bhattacharya, Homi Kharas,
and John W. McArthur
Editors

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Tackling Climate Change from an Investment-Led Development Perspective in Latin America and the Caribbean

Daniel Titelman, Michael Hanni, Noel Pérez Benítez,
and Jean-Baptiste Carpentier

Introduction

Latin America and the Caribbean are highly vulnerable to the effects of climate change, with long-lasting economic and social consequences. The region already faces the accelerating impact of a changing climate, with more frequent—and severe—natural disasters, prolonged droughts, and heatwaves (WMO, 2022). Across the region’s varied geographies, the future macroeconomic, fiscal, and social impacts will unfold at different speeds and intensities. Fiscal accounts will come under growing pressure, as public outlays for reconstruction and social support rise sharply. This may create negative feedback loops, where responding to extreme climatic events results in large increases in public debt, which in turn limits the capacity of countries to invest in building resilience, making them more vulnerable to climate change.

The region’s policy challenge is stark because responding to climate change and creating a sustainable development path is predicated on investment. Adaptation investment to build resilience will be critical to protecting, and expanding, the capital stock, limiting economic losses and a deterioration in living standards (as proxied by gross domestic product [GDP] per capita). Mitigation investments will also play a key role in driving sustainable economic

development, incentivizing the adoption of low-carbon technologies that will support the creation of dynamic, competitive, and environmentally responsible economies. Transforming the region's carbon-intensive energy sector and upgrading of public infrastructure, such as transportation and urban services, will pay a double dividend: greater resilience to climate shocks and lower long-term energy prices.

The magnitude of climate change and development investment needs is exceptionally large and represents an outsized challenge for the region, which already struggles with low overall and public investment rates. While comprehensive estimates are lacking, available studies suggest incremental investment needs ranging from around 2 percent of GDP for adaptation to upward of 10 percent of GDP per year for mitigation. Overall investment needs are likely to be much more. Existing estimates are largely focused on investment needs for key infrastructure.

However, climate change and development will require large-scale investments in "soft" infrastructure, such as social protection systems capable of achieving an orderly and just transition to a low-carbon economy.

Creating the financing framework to make these investments viable represents a major challenge for the region. Alleviating fiscal constraints to public investment will require a significant ramping up of domestic resource mobilization, particularly by increasing the region's relatively low tax take. Mobilizing private finance will be key, calling for fiscal policies and regulatory measures to channel investment to projects with large climate and development returns. Derisking climate investments and reducing the cost of capital for private investors is especially important. Multilateral and national developments can play a catalytic role in this regard, providing low-cost project finance.

This chapter is structured as follows. The next section explores the region's macroeconomic, fiscal, and social vulnerabilities to climate change. The third section underlines the crucial role of investment in tackling climate change and creating a sustainable development path for the region and estimated investment gaps. The fourth section highlights that the region faces these investment challenges from a weak starting point, with exceptionally low economic growth, limited levels of investment and productivity and reduced fiscal space. The fifth section outlines a financing framework for a climate and development investment push, reviewing policy options and potential sources of finance.

Latin America and the Caribbean Are Highly Vulnerable to the Economic and Social Impacts of Climate Change

Climate change represents a permanent shock to the region's economies, with long-lasting implications for its economic and social development. A changing

climate manifests itself in both long-term and cumulative processes as well as the onset of extreme periodic events.

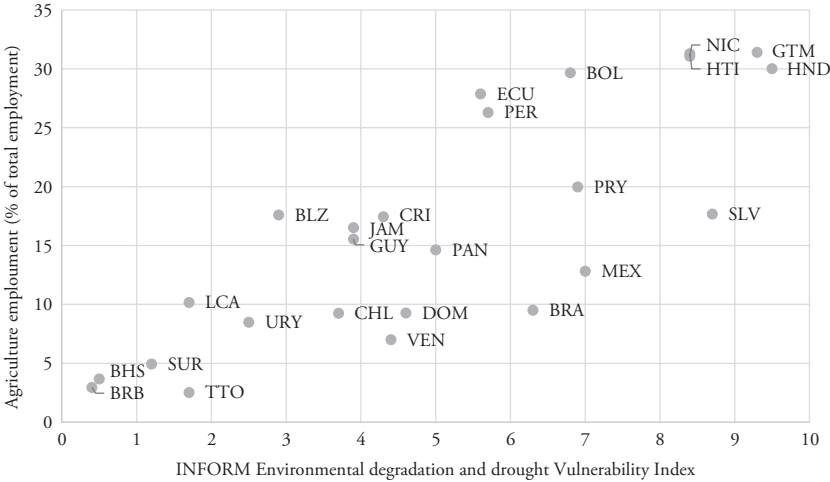
Higher temperatures will progressively change climatic conditions—higher incidence of drought and heatwaves, greater variability in precipitation, among others—in the long run, which undermine the determinants of long-run potential economic growth through various channels, including higher rates of depreciation of public and private capital, reduced economic output of existing industries—reduced crop yields, lower hydroelectric generation—and a reduction in work output (labor productivity). The stepwise change in climatic conditions is also likely to drive severe one-off meteorological and hydrological events that result in large-scale losses in capital stock and, in turn, potential economic growth. Despite these risks, the long-term impact of climate change remains difficult to estimate because of potential tipping points and cascading effects that are hard to forecast (Kemp et al., 2022).

The region's economic vulnerability to the progressive change in climatic conditions cannot be understated. Agriculture, hunting, and fishing activities are particularly exposed. The increased frequency and severity of drought, volatile precipitation, and prolonged heatwaves are projected to reduce crop yields and livestock production in the region (Morris et al., 2020). As seen in Figure 10.1, countries in the region where agricultural activities play a prominent role are also the most vulnerable to environmental degradation and drought. Agriculture represents more than 20 percent of total employment in seven countries, and above 30 percent in four of these countries (Guatemala, Haiti, Honduras, Nicaragua). It makes up more than 5 percent of total GDP in 20 countries and reaches 10 percent of GDP or more in eight of these countries (Bolivia, Dominica, Guyana, Haiti, Honduras, Nicaragua, Paraguay, Suriname). Exports of foods and beverages are also an important generator of foreign exchange, accounting for more than 20 percent of the value of total exports of goods and services in 11 countries and surpassing 35 percent in Ecuador, Guatemala, and Nicaragua.¹

The region's extractive sector will also be increasingly impacted by climatic hazards. Drought, heavy precipitation, and heatwaves create significant physical challenges for the operation of mining and hydrocarbon activities. Mining, with a high dependence on water availability, will be affected by changes in hydrological conditions (Odell et al., 2018). Much of global mine production takes place in areas that already face significant water stress (McKinsey, 2020). For example, Chile—the world's largest producer of copper—is among the most water stressed countries in the world (WRI, 2019). Rising demand for low-carbon technologies

1. Based on figures from CEPALstat, available online: <https://statistics.cepal.org/>.

Figure 10.1. Latin America and the Caribbean: Exposure of agricultural employment to environmental degradation and drought, 2015–2019 average



Source: Authors' elaboration based on data from CEPALSTAT, ILOstat, and Index for Risk Management (INFORM).

that incorporate metals such as copper and lithium—ranging from electric cars to energy efficiency solutions—will heighten stress on water systems in producing countries, especially in Latin America. These activities may be significantly curtailed as climate change increases risks to the region's overall water security (IPCC, 2022).

Catastrophic weather events are on the rise in the region, as are the economic and human costs associated with them. The frequency of natural disasters in the region has increased significantly since the beginning of the 20th century. Between the years 1900 and 1960, 157 natural disasters were recorded, with average annual economic damages below \$1 billion at 2021 prices (Centre for Research on the Epidemiology of Disasters, 2023). This trend accelerated in the 1960s, with 227 disasters being recorded between 1961 and 1980, which rose further to 874 for the period 1981–2000 and to 1,298 between the years 2000 and 2020. Annual average economic costs due to natural disasters quadrupled between 1960 and 2020, rising from around \$3 billion to more than \$14 billion at 2021 prices.

While average annual economic costs associated with natural disasters appear to be manageable at the regional level, extreme events at the country level can result in devastating losses. Caribbean and Central American countries are

particularly exposed to the effects of these extreme meteorological and climatic events. The economic damage and losses suffered by Dominica due to Tropical Storm Erika in 2015 were estimated to be equivalent to 90 percent of GDP, with damage to durable assets alone totaling more than 5 years of normal investment spending (Government of the Commonwealth of Dominica, 2015). In 2017, Hurricanes Irma and Maria caused damage and losses equivalent to 11 percent of GDP in Antigua and Barbuda, with recovery needs estimated to be 15 percent of GDP (Government of Antigua and Barbuda, 2017). Losses in the Bahamas to tropical cyclone Dorian in 2019 were estimated at 26 percent of GDP (Centre for Research on the Epidemiology of Disasters, 2023). In 2020, Nicaragua faced the impact of two major hurricanes—Eta and Iota—which resulted in economic damage equivalent to 7 percent of GDP (Centre for Research on the Epidemiology of Disasters, 2023).

Public liabilities in the aftermath of such events tend to be high, as damage—or even destruction—of physical infrastructure is costly to replace. Attending to infrastructure needs puts significant pressure on fiscal accounts, forcing countries to balance reconstruction efforts with measures to limit a deterioration in debt dynamics. Caribbean countries are particularly vulnerable to this vicious circle, with high levels of exposure to natural disasters and severe climatic events coexisting side by side with elevated public debt levels. In the absence of external aid, financing reconstruction investment through debt, even at concessional terms, heightens fiscal vulnerabilities. Increases in debt levels and debt service further limit the fiscal space to engage in ongoing adaptation investments, creating greater vulnerability to the effects of climate change and, in turn, exacerbating negative debt dynamics.

The region is also highly vulnerable to the social impact of climatic change and extreme weather events. Poverty levels remain elevated in several countries in the region, despite experiencing significant improvements in the 2000s. The region is also the most unequal in the world, with exceptionally high levels of income and wealth inequality. Vulnerable populations will be the most effected, frequently those living in areas of greater climatic risk or in economic sectors that are more exposed to climate change (especially agriculture and fishing) with precarious jobs and unstable income. They also face a higher probability of potentially insurmountable damages after a natural disaster, with insufficient savings or access to credit to cover reconstruction costs. Left unchecked, this dynamic can create a negative feedback loop in which a disaster intensifies poverty and inequality, reducing the coping capacity of vulnerable populations and leaving them more exposed to climate change.

Recent studies confirm the high level of social vulnerability in the region. Pessimistic scenarios suggest that climate change may create 5.8 million additional extreme poor in 2030, which corresponds to an increase of 305 percent compared to the baseline scenario without climate change (Arga Jafino et al., 2020). Estimates from 70 peer-reviewed climate studies suggest that a temperature increase of 1.5 degrees Celsius above preindustrial levels could result in 18 million more people exposed to water scarcity, rising to 24 million people under a scenario where the increase in temperature approaches 2.0 degrees Celsius. Increasing water scarcity, lower crop productivity, sea level rise and storm surges, as well as heatwaves, extreme events, and land loss will combine to be powerful drivers of migration from rural and coastal areas to urban areas. Estimates for Latin America suggest that internal climate migration could reach 10.7 million and up to 17.1 million people by 2050 (Rigaud et al., 2018).

Urban areas in Latin America and the Caribbean will come under increasing pressure as internal climate migration aggravates existing high levels of social vulnerability to climate change. The region is among the most urbanized in the world, with 81 percent of the population residing in urban areas in 2018, exceeded only by Northern America (82 percent) (UNDESA, 2019). Latin America and the Caribbean is also the region with the highest share of inhabitants living in megacities (10 million inhabitants or more), at 17.6 percent of total urban population, compared to 14.8 percent in Asia and 10.5 percent in North America. Cities in the region are characterized by large informal settlements, often in areas of elevated risk for floods and landslides (Vera & Sordi, 2020). Cities in the region are not well placed to tackle the impact of climate change, constrained by existing low levels of public services and insufficient—and vulnerable—infrastructure.

Investment Is Essential for Tackling Climate Change and Sustainable Development

Tackling climate change and establishing a sustainable development path in Latin America and the Caribbean is a formidable challenge. The investments required to address climate change and development needs are very large.

However, building resilience to climate through adaptation investments will be crucial for supporting economic fundamentals and maintaining societal well-being in the coming decades. The persistent and growing impact caused by rising temperatures, coupled with a higher frequency of periodic severe weather events, threatens to undermine long-run growth, particularly through the rapid depreciation of capital and the reduction in labor productivity.

Adaptation investment will be required economy-wide, but with a particular emphasis in infrastructure, such as transportation, urban services, coastal protection, water supply and sanitation, irrigation, and water control, among others.

Investment in climate change mitigation is no less important and has important development implications. Reducing the region's greenhouse gas emissions, in line with the nationally determined contributions (NDCs) submitted within the framework of the Paris Accord, will be challenging. Emissions from energy consumption and generation make up nearly half of the region's greenhouse gas emissions (Climate Watch, 2022). Energy consumption in the region is highly carbon intensive, with coal, natural gas, and oil sources averaging 74 percent of total energy consumption in 2021. Caribbean countries are especially dependent on energy from fossil fuels—accounting for more than 95 percent of total energy consumption in Antigua and Barbuda, Barbados, Grenada, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, the Bahamas, and Trinidad and Tobago—that in many cases is obtained exclusively through costly imports.² Renewable energy, as a share of total energy consumption, is relevant in several countries—Belize (33 percent), Brazil (38 percent), Colombia (30 percent), Costa Rica (51 percent), Ecuador (35 percent), El Salvador (33 percent), Honduras (32 percent), Paraguay (71 percent), and Uruguay (54 percent)—but generally corresponds to hydroelectric power generation that is at risk to climate change. Transformation of the energy sector will be at the core of sustainable development and climate action; the rapid and widespread adoption of wind and solar power will pay a double dividend: Increased resilience to climate change and significantly reduced cost of long-run power generation.

The magnitude of adaptation and mitigation investment needs is only imprecisely estimated given the cross-cutting nature of climate actions and the inherent uncertainties about the future impacts of climate change. Despite the shortcomings of the existing studies, there is general agreement that the investment gaps that need to be addressed are very large (Table 10.1). A range of studies focused on Latin America and the Caribbean estimate gaps in the range of 3 percent to 8 percent of GDP, which would represent a major investment push given the level of overall investment in the region was equivalent to 19.7 percent of GDP in 2021.

Comprehensive estimates at the country level are scarce, and existing studies frequently present approximate values of required external financial support to achieve countries' climate adaptation and mitigation actions. Recent

2. Based on 2021 data from U.S. Energy Information Administration (EIA), <https://www.eia.gov/international/data/world>

Table 10.1. Representative list of recent studies of investment needs related to climate change adaptation and mitigation

Level	Source	Elements considered	Estimated annual investment needs
Latin America and the Caribbean	Castellani et al. (2019)	Infrastructure and addressing extreme poverty	10.6 percent of GDP by 2030 16 percent of GDP by 2030 (including completion of secondary education)
Latin America and the Caribbean	Rozenberg and Fay (2019)	Electricity, transport, water sanitation, flood protection, irrigation	2.6—8.8 percent of GDP, depending on scenario
Latin America and the Caribbean	Fay et al. (2017)	Infrastructure investment	3—8 percent of GDP
Antigua and Barbuda	Government of Antigua and Barbuda, first NDC, updated submission (2021)	Adaptation and mitigation actions	6.8—11.6 percent of GDP (adaptation and mitigation)
Belize	Government of Belize, first NDC, updated submission (2021)	Adaptation and mitigation actions	1.3 percent of 2021 GDP (adaptation), 5.7 percent of 2021 GDP (mitigation)
Dominican Republic	Government of the Dominican Republic, first NDC updated submission (2020)	Food security, infrastructure resilience, water, biodiversity	0.9 percent of 2021 GDP (adaptation), 0.9 percent of 2021 GDP (mitigation)
Grenada	Government of Grenada, second NDC (2020)	Mitigation actions	9—9.5 percent of 2021 GDP (mitigation)
Guyana	Government of Guyana, first NDC (2016)	Adaptation actions	2.1 percent of 2021 GDP (adaptation)
Haiti	Government of Haiti, first NDC updated submission (2021)	Adaptation and mitigation actions	6.2 percent of 2021 GDP (adaptation), 1.9 percent of 2021 GDP (mitigation)

Table 10.1. (Continued)

Saint Lucia	Government of Saint Lucia, first NDC updated submission (2021)	Mitigation actions	2.2 percent of 2021 GDP (mitigation)
Suriname	Government of Suriname, second NDC (2020)	Adaptation and mitigation actions	4.2 percent of 2021 GDP (adaptation and mitigation)
Trinidad and Tobago	Government of Trinidad and Tobago first NDC (2018)	Mitigation actions	0.8 percent of 2021 GDP (mitigation)

Source: Authors' elaboration based on cited publications.

submissions of NDCs suggest that adaptation investment needs in countries in the Caribbean are within the range of 1–2 percent of GDP per year. Estimated mitigation investment needs, in contrast, are much larger, reaching upward of 10 percent of GDP in countries such as Antigua and Barbuda and Grenada, where ambitious mitigation objectives will necessitate a wholesale restructuring of the energy and transport matrix.

The Region Faces This Investment Challenge from a Weak Starting Point

Economic activity in the region has stagnated in the past decade, exhibiting exceptionally low growth rates after a period of rapid expansion coinciding with a global commodity “supercycle.” Annual GDP growth averaged just 0.6 percent between 2014 and 2019, a period marked by falling commodities prices—particularly a collapse in international oil prices—and growing macroeconomic imbalances. Economic recovery has proved elusive, despite a strong rebound in 2021, and is projected to return to the meager rates observed prior to the crisis. The region suffers from multiple structural deficiencies that undermine long-run economic growth. Both private and public investment in the region are exceptionally low, resulting in a capital stock that is insufficient to spur the creation of more dynamic economies. Productivity is likewise low, reflecting the interaction of limited investment flows, a small stock of physical capital, and low levels of human capital.

If left unaddressed, climate change will intensify these structural gaps, directly impacting the underlying determinants of potential economic growth. Current investment levels, if maintained, would be insufficient to promote the needed accumulation of capital to bolster resilience to climate change. The increasing frequency and intensity of extreme climatic events—natural disasters

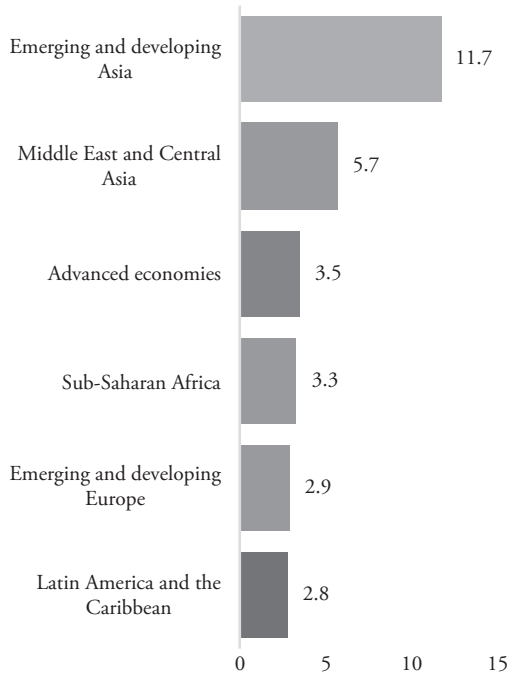
as well as droughts and floods—will likely result in accelerating rates of depreciation and outright destruction of the existing, largely climate-vulnerable, public capital stock. The region's energy matrix—highly carbonized—which underpins its productive structure will become increasingly costly to maintain as energy markets undergo significant changes in the coming decades. Labor productivity levels are also projected to decline as higher temperatures impact work performance and agricultural productivity.

Total investment in the region has lagged that of other emerging markets and developing economies for the last three decades. Investment rates in Latin America and the Caribbean, for example, have hovered around 20 percent of GDP since the 1990s. Comparable rates in emerging and developing Asia have been in the range of 40 percent of GDP for more than a decade, playing a major supportive role in economic growth and development. Notably, investment in Latin America and the Caribbean is also below the levels seen in advanced economies, despite the potential for rapid investment growth to close gaps in capital stock between the two groups of countries. Capital formation dynamics have also deteriorated in the last decades and have become more volatile since 1990, with more frequent cyclical downturns of greater magnitude and duration (ECLAC, 2022a).

Public investment is also exceptionally low in Latin America and the Caribbean. As shown in Figure 10.2, the region's capital formation at the general government level, which includes central and subnational governments, is the lowest among developing regions and below the level registered for advanced economies too. In 2019, the region dedicated just 2.8 percent of GDP to public investment, compared to 11.7 percent of GDP for the economies of emerging and developing Asia. This low level of investment translates to a small public capital stock, which provides limited and generally lower-quality economic services necessary to generate economic growth and development. Various metrics suggest that the quality of the region's infrastructure, largely the product of public sector investment, is lacking with consequences for competitiveness and growth (WEF, 2018).

There is limited fiscal space in the region to undertake active public policies to bolster growth, investment, and productivity. Stagnant public revenues were unable to meet the demands of public spending, resulting in persistent and elevated fiscal deficits in the decade leading up to the COVID-19 pandemic. In Latin America, these deficits and weakening macroeconomic fundamentals resulted in unfavorable debt dynamics, pushing central government gross public debt from a low of 29.4 percent of GDP in 2008 to 45.4 percent of GDP in 2019 (ECLAC, 2022a). Faced with rising debt, rising sovereign risk, and credit rating downgrades, Latin American countries increasingly pursued fiscal consolidation measures, including tax reforms and spending constraint, to reduce primary

Figure 10.2. Selected regions: General government gross fixed capital formation, 2019
(Percentages of GDP on the basis of constant prices, weighted average)



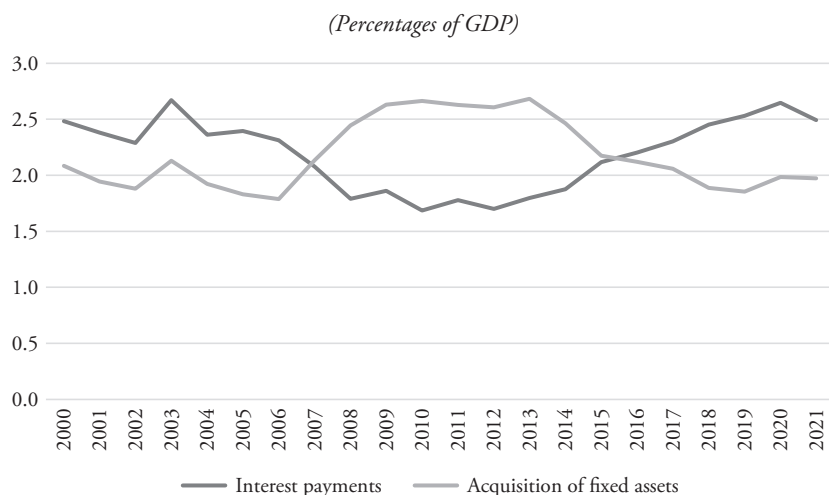
Note: Weighted averages, based on GDP purchasing power parity international dollars at current prices.

Source: Authors' elaboration based on IMF World Economic Outlook database, "Investment and capital stock dataset," <https://data.imf.org/?sk=1CE8A55F-CFA7-4BC0-BCE2-256EE65AC0E4>, and ECLAC (2022a).

deficits. Public investment was particularly hard hit, becoming the primary variable of fiscal adjustment to accommodate rising interest payments (Figure 10.3). Likewise, many countries in the Caribbean exercised strict fiscal restraint, forgoing needed social spending and public investment, in a bid to generate primary surpluses to reduce debt levels.

The COVID-19 pandemic upended the region's fiscal position in 2020, with potentially long-lasting consequences. Despite limited fiscal space, countries adopted unprecedented large-scale support packages, averaging 4.6 percent of GDP in Latin America alone (ECLAC, 2021a). However, the sharp rise in expenditure, combined with falling tax revenues, led to the creation of large deficits. The average overall balance for Latin America in 2020 reached a deficit of 6.9 percent of GDP, with the Caribbean registering a similar level (–6.8 percent of GDP). In the case of Latin America, deficits in 2020 surpassed those seen during the debt crisis of the 1980s.

Figure 10.3. Latin America (16 countries): Central government interest payments and investment in fixed assets, 2000–2021^a



Source: Authors' elaboration based on Economic Survey of Latin America and the Caribbean 2022, ECLAC (2022a). Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, and Uruguay.

These dynamics led to a sharp rise in public debt levels in both subregions. In Latin America, public debt reached levels last seen in the early 2000s during the midst of the economic crises that battered Argentina and Brazil in the years running up to 2002. In the Caribbean, public debt reached 89.3 percent of GDP, an increase of 21.1 percentage points over the level of 2019 (68.2 percent of GDP). By the end of 2021, six countries had debt levels above 90 percent of GDP: Bahamas, Barbados, Belize, Dominica, Jamaica, and Suriname (ECLAC, 2022a). Barbados and Suriname are particularly exposed, with debt levels above 130 percent of GDP. Despite a recent debt restructuring in Barbados—for domestic debt in 2018 and external debt in 2019—debt service remains high. Suriname entered an arrangement with the IMF under the Extended Fund Facility in late 2021 to support the domestic economy and tackle debt issues. Protracted negotiations between the country and its private and bilateral creditors are ongoing.

Financing Framework to Boost Climate and Development Investment

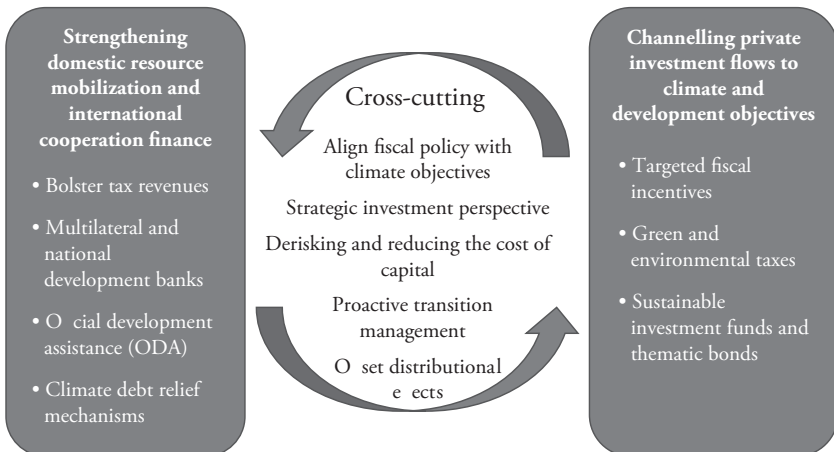
Meeting the climate change imperative across Latin America and the Caribbean demands prompt action. Delivering crucial adaptation and mitigation investments in the short term will strengthen public accounts in the medium term and

bolster the competitiveness of the economy while safeguarding social welfare. The needed scale of these investments is substantial, as described earlier, and they cannot be achieved by the public or private sector alone. Achieving an investment push therefore calls for a holistic and coherent financing strategy that aligns fiscal policy with climate and development objectives and that creates the conditions to incentivize and crowd-in private investment.

Figure 10.4 highlights two key pillars of this financing framework for a climate and development investment push. Bolstering public domestic resource mobilization and international cooperation finance—engaging multilateral development banks, official development assistance, and climate debt relief—will be key to creating the permanent revenues needed to finance ongoing public investment. These efforts must be accompanied by public policies, such as tax incentives and environmental taxes, to channel private investment toward climate and development objectives. Special attention should be paid to derisking climate mitigation and adaptation projects, particularly by leveraging multilateral development banks to reduce the cost of capital for private investments. Regulatory measures are also needed to harness sustainable funds and thematic bond markets to finance key climate and development investments.

Figure 10.4 also highlights some cross-cutting principles which should guide policy design. First, public policy should be guided by a strategic perspective that prioritizes investments with high environmental, economic, and social returns. Specific attention should be given to projects with high positive externalities but that are not financially viable in their own right. Second, given the region’s high level of economic and social vulnerability to climate change, a robust policy

Figure 10.4. Financing framework for a climate and development investment push



Source: Authors’ elaboration.

response calls for proactive transition management that aligns public policies, regulatory frameworks, and social policies toward the achievement of climate and development objectives. Third, the impact of climate change and climate policies is not shared equally across society. Internalizing the distributional effects to ensure that public policies address the vulnerabilities of low-income and other exposed populations will be crucial for maintaining social support for climate action.

Strengthening Domestic Resource Mobilization and International Cooperation Finance

Domestic Resource Mobilization

In Latin America and the Caribbean, public revenues have been insufficient to meet the demands of public spending, particularly investment, leading to entrenched deficits and upward pressure on debt levels. Thus, there is substantial room to strengthen domestic resource mobilization to increase the fiscal capacity of countries in the region to undertake climate change and development investments. The average tax take is low, at 21.9 percent of GDP in 2020, compared to 33.5 percent among the countries of the OECD, and several countries register less than 20 percent of GDP in tax revenues. Tax revenues are also low compared to other regions with a comparable level of economic development (OECD et al., 2021).

There are multiple opportunities for countries to bolster the tax take in the short term. Countries should take prompt action to tackle tax evasion and review costly tax expenditures. ECLAC estimates that revenue losses due to tax non-compliance in the region reached \$325 billion in 2018, equivalent to 6.1 percent of regional GDP (ECLAC, 2020). Tax systems in some countries collect less than half of the revenues that they should generate. This is especially pronounced in the case of the corporate and personal income taxes, with corporate tax losses estimated at between 0.7 percent and 5.3 percent of GDP in Latin America. Tax expenditures—meaning forgone revenues attributable to special tax law provisions—also represent significant forgone revenues in the region, averaging 3.7 percent of GDP. Fiscal incentives for investment are also significant—around 1.0 percent of GDP—and should be more fully aligned with climate and development objectives (ECLAC-Oxfam, 2019; ECLAC, 2019).

In the medium term, the region will necessarily require structural tax reforms to generate the resources necessary to attend to climate investment and support growing social demands. Consolidating the personal income tax will be key, as

it represents one of the principal tax gaps between the region and the OECD, with revenues averaging 2.2 percent of GDP in the region compared to 8.0 percent of GDP in the OECD in 2020 (OECD et al., 2022). There is scope to expand and strengthen wealth and property taxes, which generate little revenues despite their potential in such a highly unequal region. The review and modernization of fiscal regimes applied to the exploitation of nonrenewable natural resources is also a pending task for many producing countries. Reforms of these frameworks are especially key as the move toward a net zero emissions scenario will have severe fiscal and macroeconomic consequences for oil and gas producers in the region (Titelman et al., 2022). Mining countries, in contrast, may find themselves benefitted in this scenario, increasing the importance of establishing progressive tax frameworks before global demand for their minerals and metals increases.

Multilateral and National Development Banks

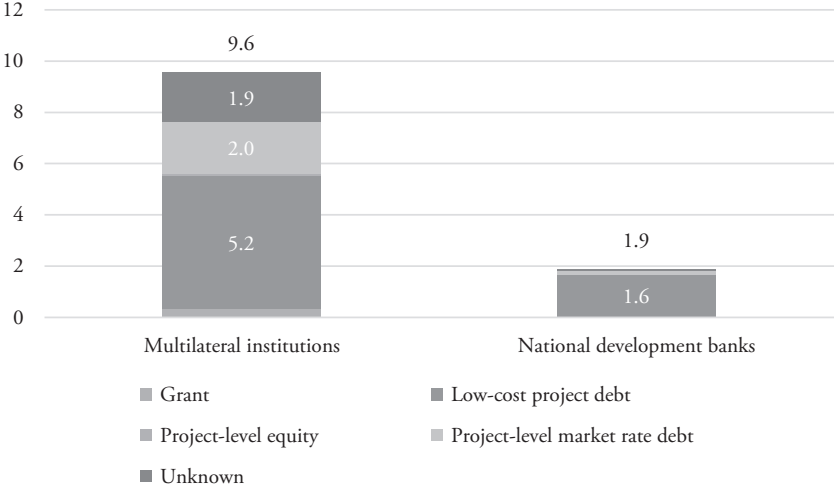
Multilateral development banks (MDBs), and their national counterparts (NDBs), can play a catalytic role in driving public and private climate and development investment. The involvement of these institutions can significantly lower the cost of capital, strengthen investment governance, and support the derisking of climate projects. In support of the aims, the Inter-American Development Bank, the Development Bank of Latin America, the Caribbean Development Bank, and the Central American Bank for Economic Integration seek to mobilize \$50 billion in financing for climate action by 2025—up from around \$33.3 billion in climate-related finance from 2015 to 2019 in the region (IDB, 2022; OECD et al., 2022).

Financing provided by MDBs and NDBs in the region is rather modest. As seen in Figure 10.5, between 2019 and 2020, NDBs and multilateral institutions provided an average of \$11.5 billion (0.2 percent of 2019 GDP) per year in climate finance in the region. A significant amount of the financing provided was in the form of low-cost project debt or project-level market rate debt. Data from national development banks in Brazil, Chile, and Mexico suggest much of their mitigation financing targets renewable energy, other forms of low-carbon energy production, and energy efficiency (Abramskiehn et al., 2017).

Beyond the provision of finance, MDBs could increase their impact in the region by providing support to countries as they seek to strengthen or build investment governance frameworks. National public investment systems are common in the region, but they require further strengthening to manage the

Figure 10.5. Latin America and the Caribbean: Multilateral institutions and national development banks climate finance, 2019–2020 average

(Billions of dollars)



Source: Authors' elaboration based on CBI (2021).

magnitude of investments necessary to tackle climate change and promote sustainable development. Due diligence carried out by MDBs provide important benchmarks to identify quality projects with high economic, social, and climatic impacts. This is especially crucial when public investment projects include private sector partners, particularly participation by foreign companies or nongovernmental organizations.

MDBs should also strengthen their support for derisking of private sector investment targeting climate change and sustainable development. These projects are inherently risky, exposed to a wide range of potential sovereign, policy, financial, macroeconomic, and technological risks, among others. The risk premium attached to these projects make many economically unviable, with the cost of capital well exceeding the potential financial return on investment. For countries, however, the potential social, environmental, and technological returns on these investments are large. Making these projects economically viable must therefore be a priority policy objective for governments and MDBs. For national governments, a key prerequisite is the establishment of a credible climate and investment framework. Establishing clear priorities and policies, backed by a solid legal framework, can substantially reduce political, sovereign, and policy risk. MDBs can backstop these measures through the extension of low-cost capital and insurance guarantees.

Official Development Assistance

Official development assistance (ODA) is a potential source of needed climate finance in the region, but it plays a very modest role. Total ODA flows targeting the region were largely flat in constant terms over the last 20 years, with a clear downward trend relative to GDP before stabilizing in the decade of the 2010s, averaging 0.16 percent of GDP between 2010 and 2019. The relative stability of ODA during the latter period was largely due to a significant rise in targeting climate change adaptation and mitigation projects. While the volume of climate change–related ODA flows is very modest, averaging 0.06 percent of GDP between 2010 and 2019, they represent one third of total ODA flows.

The increasing share of climate-related ODA flows, relative to total flows, is suggestive of a possible displacement of ODA targeting other priority areas, such as poverty reduction. However, given the cross-cutting nature of climate change, climate projects also manifest strong economic and social impacts. The efficiency and effectiveness of climate finance ODA can be hindered as it is channeled through multiple actors, including multilateral organizations, nongovernmental organizations, the private sector, and government agencies, among others. This highlights the importance of establishing clear climate change frameworks and coordination systems to ensure complementarity between projects carried out by governments and those by other actors.

Climate Debt Relief Mechanisms

Climate risk in the region is often correlated with concerns over the sustainability of public debt. As mentioned earlier, countries in the Caribbean are particularly vulnerable to the effects of climate change as natural disasters and severe climatic events increase in frequency and intensity. They are also among the most indebted countries in the world. Debt restructuring and relief mechanisms that address the nexus between climate change and public debt remain undeveloped. Despite widespread agreement on the importance of rationalizing and institutionalizing debt restructuring processes, there has of yet been little progress. General debt relief measures are also lacking, with the Paris Club being the principal exception. The Debt Service Suspension Initiative (DSSI), established in 2020, represented a positive step, but its strong focus on low-income countries and liquidity concerns limited its potential to bolster fiscal space more widely. The Common Framework for Debt Treatment beyond DSSI established by the G20 to tackle debt crises has been less successful due to limited participation of some key creditors and continuing challenges with debt contracts. The Common Framework, like the DSSI, has a limited scope, targeting mainly low-income countries, despite the need for similar relief efforts for middle-income countries.

Given the intimate links between climate change and debt vulnerability in the region, creating viable climate debt restructuring and relief mechanisms will be key to creating the fiscal space needed to drive a public investment big push. ECLAC is spearheading a Debt for Climate Adaptation initiative that envisions the creation of a Caribbean Resilience Fund to provide long-term, low-cost development financing for investment in climate adaptation and mitigation. The fund would also provide a financing window for debt restructuring and reprofiling to tackle high debt levels and liquidity concerns.

The Caribbean could also benefit from debt for climate change adaptation swaps; however, as of yet there has been only limited movement in this area. A promising example of such an initiative is the debt-for-nature swap signed between the government of Belize and The Nature Conservancy (TNC). Within the framework of the agreement, a TNC subsidiary lent funds to the country to repurchase its outstanding external debt at a discounted rate, reducing the country's debt burden by approximately 12 percentage points of GDP (ECLAC, 2021b). The loan is backed by the proceeds of a blue bond, which will also provide resources to support marine conservation.

Further work in the region will be required to strengthen the inclusion of disaster and hurricane-linked clauses to new debt offerings. External exogenous shocks, including severe climatic events or other climate-linked natural disasters, can be a key precipitating factors for debt crises. Countries in disaster prone areas are looking to establish innovative mechanisms to provide liquidity relief in the aftermath of a crisis. In the Caribbean, Grenada (2015) and Barbados (2018) successfully incorporated disaster/hurricane clauses in their restructured debt, but as yet not in regular debt issuance. Further development of this mechanism could consider potential links to environmental, social, and governance (ESG)-related indicators that could make these debt instruments more attractive for institutional investors, especially as creditors may demand higher interest rates.

Channeling Private Investment Flows to Climate and Development Objectives

Tax Incentives

The use of fiscal incentives to promote investment is widespread in Latin America and the Caribbean (ECLAC-Oxfam, 2019). Countries provide a wide range of preferential tax treatments—including exemptions, deductions, credits, reduced rates, and deferrals—to promote public policy objectives. During the past decade, tax incentives have been offered for climate-related objectives, principally mitigation efforts related to energy production or use. In most cases, the use of tax incentives was established within the framework of energy policy

reform or national decarbonization plans. Incentives for renewable energy are particularly prominent, often employed as a complement to other energy policies such as feed-in tariffs or quota obligations, among others (Podestá et al., 2022). Electromobility tax incentives are also becoming more widespread, with recent laws—including the Green Transport Law in Costa Rica³ and the 2022 budget measures in Barbados⁴—offering a significant reduction or complete exoneration from a series of consumption taxes.

Ensuring the effective use of these instruments calls for a strategic perspective that identifies areas where tax incentives can play a catalytic role in unlocking private capital, while at the same time minimizing public revenue losses. Climate and development strategies need to be complemented by efforts to build strong governance structures for tax incentives and ensure the most effective incentive instruments are employed (CEPAL-Oxfam, 2019). Tax incentives should be established in tax laws or codes, preferably centralized within one instrument, which establishes the objectives of each tax incentive—backed by cost-benefit analysis—the beneficiaries, and how the benefit can be requested. The administration of tax incentive programs should be centralized, to the extent possible, in ministries of finance and tax administrations to ensure policy coherence and institutionalize review processes. Ongoing cost-benefit analysis should be established to identify the effectiveness of incentives with the aim of reforming or eliminating underperforming measures. This can be important within the context of climate incentives, as the price of some low-carbon technologies may fall to the point where tax benefits are no longer necessary to promote their adoption. Finally, countries should take steps to increase transparency around the use of tax incentives and their costs.

Green and Environmental Taxes

Taxation can also play a crucial role in shifting the incentives of economic actors to promote climate and development investment. Climate change represents a classic case of the tragedy of the commons, where companies and households make use of a common resource—in this case the atmosphere—in their

3. Law of Incentives for Green Transport (Law No. 10.209 of 2022, which reforms Law No. 9.518 of 2018), which provides for a series of tax benefits for the purchase of qualifying electric vehicles, including a reduced value-added tax rate (starting at 1 percent, rising with time), and temporary exemptions for the excise tax (for 36 months) and property tax.

4. Barbados implemented a series of tax benefits to promote the adoption of low-carbon technologies, including a 2-year VAT holiday on the purchase of electric cars, a reduction import tariff for fuel-cell and solar powered vehicles (10 percent from 45 percent), and a reduction in the import duty and excise tax for new fuel-cell electric cars, among others.

self-interest, but to the detriment of the common good, leading to the eventual depletion or degradation of resource. Green taxes, carbon taxes, and other environmental levies therefore seek to internalize the environmental, economic, and social costs of these negative externalities and thereby influence the production and consumption decisions of economic actors.

Carbon taxes are still in their infancy in the region. Mexico enacted a carbon tax as part of a 2014 tax reform, with a levy of \$3.5 per ton of carbon dioxide released during combustion. The carbon tax in Colombia, adopted in 2016, established a tax of \$5 per ton of carbon dioxide generated by the use of fossil fuels, annually adjusted for inflation. The most ambitious green tax reform in the region to date was that carried out by Chile in 2014, which established taxes on emissions from fixed sources as well as a levy on the sale of new vehicles based on expected lifetime nitrogen oxide emissions.

Nevertheless, carbon taxes in Latin America and the Caribbean may be insufficient to achieve mitigation goals or to offset losses from falling hydrocarbons taxes. For example, agriculture, land-use change, and forestry account for nearly one half of the region's emissions and are less amenable to carbon taxes than those applied to the carbon content of fuels. At the same time, the revenues raised by carbon taxes on energy will provide little relief to hydrocarbon producers as their oil and gas revenues decline as the global community moves to a net zero emissions policy framework (Titelman et al., 2022).

Tax measures to cut carbon emissions must also take into account the inherent distributional effects of green tax policies, which may be regressive in nature. Chancel et al. (2022) highlight the need for a new approach to climate policymaking, based on a mix of instruments targeted to population income groups. For the bottom 50 percent, public investments in green energy access and low carbon public transports are needed, as well as cash transfers to compensate for the increase in fossil energy prices and to compensate workers in industries affected by the transition. For the top 10 percent, and particularly for the top 1 percent, the authors advocate for the adoption of wealth or corporate taxes with pollution top-up to finance the green transition, accelerate divestment from fossils, and accelerate the removal of the fossil fuel subsidies, which benefit mainly the wealthy groups.

*Sustainable Investment Funds and Bonds
(Green, Social, Sustainable Development)*

Sustainable investment funds and innovative financial products have grown rapidly in recent years and represent an important potential source of climate finance. UNCTAD (2022) estimates that the value of sustainability linked financial assets reached \$5.2 trillion in 2021, a 63 percent year-on-year increase

compared to 2020.⁵ Assets under management by sustainable funds—also known as ESG funds as the composition of the fund is linked to ESG ratings—is estimated at \$2.7 trillion in 2021. Most assets under management of these funds are in developed countries, principally in Europe (81 percent of the total), reflecting the size and liquidity of that region’s financial markets, supportive financial regulation, and the widespread reporting of ESG indicators by publicly listed corporations.

Sustainable funds play a very minor role in climate finance in developing countries and emerging markets. Existing sustainable funds outside developed economies are small in number and are principally located in developing Asia (UNCTAD, 2022). There are relatively few sustainable funds in Latin America and the Caribbean—mainly in Brazil—and the assets they manage are modest in scale. Significant barriers exist to the development of domestic sustainable funds in the region, reflecting the limited size and perceived high risk of financial markets, and the lack of required regulatory frameworks necessary. The region is also a minor recipient of investment by sustainable funds located in developed economies. A major limiting factor is the relative paucity of ESG reporting by firms in the region. Regulators in Brazil, Chile, Colombia, and Mexico have taken steps to mandate the inclusion of ESG indicators in annual financial reporting and establish how domestic institutional investors—particularly pension funds—should include ESG considerations in their investment decisions and risk analysis.

A growing area of climate and development finance is the use of thematic debt instruments. The global green bond market alone is expected to double in value in 2022, reaching \$1 trillion by the end of 2022, and may reach \$5 trillion by 2025 (CBI, 2021). Social and sustainability-linked bonds (e.g., SDG bonds) have also grown rapidly at the global level. Issuances of thematic bonds at the regional level rose from \$7.2 billion in 2019 to \$13 billion in 2020 and \$32.2 billion in 2021 (roughly 3.4 percent of global thematic bond issuance) (ECLAC, 2022b). The doubling of the thematic bond market in the region between 2020 and 2021 is principally attributable to the strong rise in social bonds offered by sovereign issuers aimed at financing social assistance programs to counteract the impact of the COVID-19 pandemic.

Private companies in the region have taken advantage of the thematic bond market to finance projects that reduce their carbon footprint. Two thirds of

5. The overall size of the ESG market is imprecisely estimated and varies significantly depending on the definition employed. For example, Global Sustainable Investment Alliance (2021) estimates that the value of assets linked to ESG-related investment funds approached \$35.3 trillion in 2020.

thematic bonds issued by private firms during the period were green bonds, with the energy sector leading with cumulative issuances of almost \$4.2 billion (IDB, 2022b). Indicative examples include the green bonds issued by AES Gener SA for \$450 million in 2019 and Colbun SA for \$600 million in 2021 to finance energy efficiency and renewable energy investments. Beyond the energy sector, the financial sector issued \$1.4 billion in sustainable bonds between 2019 and 2021 with the aim of offering credit lines to customers for the financing of sustainable projects (IDB, 2022b).

Conclusion

Climate change represents an epochal challenge for Latin America and the Caribbean. The region is already experiencing the growing effects of a changing climate. The frequency and severity of natural disasters and severe climatic events has increased, most notably impacting the Caribbean and Central America. The region is acutely vulnerable to these shocks due to its inability to ignite sustainable economic growth and development—which in turn limits its potential to respond to climate change—alongside public accounts characterized by large deficits and high debt levels, a high dependence on economic sectors that will be negatively impacted by climate change, and the exceptionally unequal social impact of a changing climate.

Responding to climate change and placing the region on a sustainable development path is contingent on large-scale, economy-wide investment. Unfortunately, the region simply does not invest enough to generate long-term economic growth and a productive capital stock. Overall investment levels are meager, among the lowest in the world. Public investment is extremely limited, resulting in a small public capital stock incapable of providing the economic services to support dynamic and competitive economies. Against this backdrop, a sustained investment effort to tackle climate adaptation and mitigation alone—between 2 percent and 10 percent of GDP—appears to be daunting.

Making large-scale climate and development investment viable will require a comprehensive financing framework that aligns fiscal policy with climate and development objectives, while managing fiscal sustainability, and that unlocks private capital. Bolstering domestic resource mobilization, principally through tax revenues, is required to generate the permanent revenues necessary to maintain a public investment push. These efforts can be multiplied by support from multilateral and national development banks, especially by derisking climate investment projects and by reducing the cost of capital for private investors. A mix of financial regulations and fiscal policies, including fiscal incentives and green taxes, can incentivize private investment and harness financial markets toward the deep challenges of climate change and sustainable development across the region.

References

- Abramskiehn D., Hallmeyer, K., Trabacchi, C., Escalante, D., Netto, M., Cabrera, M., & Vasa, A. (2017). Supporting national development banks to drive investment in the nationally determined contributions of Brazil, Mexico, and Chile. Inter-American Development Bank (Sept.), Washington DC.
- Arga Jafino, B., Walsh, B., Rozenberg, J., & Hallegatte, S. (2020). Revised estimates of the impact of climate change on extreme poverty by 2030. Policy Research Working Paper 9417, World Bank. <https://openknowledge.worldbank.org/handle/10986/34555#:~:text=Thousands%20of%20scenarios%20are%20used,132%20million%20in%20most%20scenarios>
- Carbon Brief. (2018). “The impacts of climate change at 1.5C, 2C and beyond.” <https://interactive.carbonbrief.org/impacts-climate-change-one-point-five-degrees-two-degrees/>.
- Castellani, F., Olarreaga, M., Panizza, U., & Zhou, Y. (2019). Investment gaps in Latin America and the Caribbean. *International Development Policy*. <https://doi.org/10.4000/poldev.2894>
- Centre for Research on the Epidemiology of Disasters. (2023). The International Disaster Database, EM-DAT. <https://www.emdat.be>
- Chancel, L., Piketty, T., Saez, E., Zucman, G., et al. (2022). World inequality report 2022. World Inequality Lab.
- Climate Bonds Initiative (CBI). (2021). \$1Trillion annual green bond milestone tipped for end 2022 in latest survey: Sean Kidney calls for \$5trillion per year by 2025. <https://www.climatebonds.net/2021/10/1trillion-annual-green-bond-milestone-tipped-end-2022-latest-survey-sean-kidney-calls>
- Climate Watch. (2022). CAIT Historical GHG Emissions. <https://www.climatewatch-data.org/ghg-emissions>
- Economic Commission for Latin America and the Caribbean (ECLAC). (2019). Fiscal panorama of Latin America and the Caribbean 2019: Tax policies for resource mobilization in the framework of the 2030 Agenda for Sustainable Development. (LC/PUB.2019/8-P).
- . (2020). Fiscal panorama of Latin America and the Caribbean, 2020: Fiscal policy amid the crisis arising from the coronavirus disease (COVID-19) pandemic. (LC/PUB.2020/6-P).
- . (2021a). Fiscal panorama of Latin America and the Caribbean 2021: Fiscal policy challenges for transformative recovery post-COVID-19. (LC/PUB.2021/5-P).
- . (2021b). Capital flows to Latin America and the Caribbean: First nine months of 2021. (LC/WAS/TS.2021/9), pp. 30–31.
- . (2022a). Economic survey of Latin America and the Caribbean 2022. (LC/PUB.2022/9-P).
- . (2022b). Fiscal panorama of Latin America and the Caribbean 2022: Fiscal policy challenges for sustainable and inclusive development. (LC/PUB.2022/7-P).
- ECLAC-Oxfam. (2019). Tax incentives for businesses in Latin America and the Caribbean. Summary. (LC/TS.2020/19).
- Fay, M., Andres, L. A., Fox, C., Narloch, U., Staub, S., and Slawson, M. (2017). Rethinking infrastructure in Latin America and the Caribbean: Spending better to achieve more. World Bank, Washington, DC.

- Global Sustainable Investment Alliance. (2021). Global sustainable investment: Review 2020.
- Government of Antigua and Barbuda. (2017). Hurricane Irma recovery needs assessment: A report by the government of Antigua and Barbuda. <https://www.gfdrr.org/en/publication/hurricane-irma-and-maria-recovery-needs-assessment-antigua-and-barbuda>
- Government of the Commonwealth of Dominica. (2015). Rapid damage and impact assessment Tropical Storm Erika. <https://www.gfdrr.org/sites/default/files/publication/Dominica-Rapid-Damage-and-Needs-Assessment.pdf>
- Inter-American Development Bank (IDB). (2022a). IDB Group reaffirms climate leadership, signs \$50 billion accord with other institutions. <https://www.iadb.org/en/news/idb-group-reaffirms-climate-leadership-signs-50-billion-accord-other-institutions>
- Inter-American Development Bank (IDB). (2022b). Green bond transparency platform. <https://www.greenbondtransparency.com/>
- Intergovernmental Panel on Climate Change (IPCC). (2022). Summary for policymakers. In H.-O. Pörtner, D. C. Roberts, M. Tignor, E. S. Poloczanska, K. Mintenbeck, A. Alegria, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, & B. Rama (Eds.), *Climate change 2022: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 3–33). Cambridge University Press. <https://doi.org/10.1017/9781009325844.001>
- Kemp L., Xu, C., Depledged, J., Ebie, K. L., Gibbins, G., Kohlerg, T. A., Rockstrom, J., Scheffer, M., Schellnhuber, H. J., Steffenm W., & Lenton T. M. (2022). Climate endgame: Exploring catastrophic climate change scenarios. *PNAS*.
- McKinsey. (2020). “Here’s how the mining industry can respond to climate change.” <https://www.mckinsey.com/business-functions/sustainability/our-insights/sustainability-blog/here-is-how-the-mining-industry-can-respond-to-climate-change>
- Morris, M., Rekha Sebastian, A., & Perego, V. M. E. (2020). Future foodscape. Re-imagining agriculture in Latin America and the Caribbean. World Bank. <https://documents1.worldbank.org/curated/en/942381591906970569/pdf/Future-Foodscapes-Re-imagining-Agriculture-in-Latin-America-and-the-Caribbean.pdf>
- Odell, S., Bebbington, A., & Frey, K. E. (2018). Mining and climate change: A review and framework for analysis. *The Extractive Industries and Society*, 5(1), 201–214.
- OECD-ECLAC-CIAT-IDB. (2021). Revenue statistics in Latin America and the Caribbean 2021. OECD Publishing.
- . (2022). Revenue statistics in Latin America and the Caribbean 2022. OECD Publishing.
- Podestá, A., Eirin, M. S., Contreras Lisperguer, R., & Salgado Pavez, R. (2022). Políticas de atracción de inversiones para el financiamiento de la energía limpia en América Latina, Documentos de Proyectos (LC/TS.2022/116).
- Rigaud, K., de Sherbinin, A., Jones, B., Bergmann, J., Clement, V., Ober, K., Schewe, J., Adamo, S., McCusker, B., Heuser, S., & Midgley, A. (2018). *Groundswell: Preparing for internal climate migration*. World Bank.
- Rozenberg, J., & Fay, M. (2019). Beyond the gap: How countries can afford the infrastructure they need while protecting the planet. Sustainable Infrastructure Series. World Bank.

- Titelman, D., Benitez, N., Hanni, M., Pérez Verdía Canales, C., & Saade Hazin, M. (2022). Fiscal impact estimates of a net-zero emissions transition for major hydrocarbon producers in Latin America and the Caribbean. TCD-IMF, Boston University.
- United Nations Conference on Trade and Development (UNCTAD). (2022). World investment report 2022: International tax reforms and sustainable development. United Nations.
- United Nations Department of Economic and Social Affairs (UNDESA). (2019). World urbanization prospects: The 2018 revision (ST/ESA/SER.A/420). United Nations.
- Vera, F., & Sordi, J. (2020). *Ecological design: Strategies for the vulnerable city: Adapting precarious areas in Latin America and the Caribbean to climate change*. Inter-American Development Bank.
- World Economic Forum (WEF). (2018). The global competitiveness report 2017–2018. WEF
- World Meteorological Organization (WMO). (2022). State of the climate in Latin America and the Caribbean 2021. (WMO-No. 1295).
- World Resources Institute (WRI). (2019). “Aqueduct 3.0 country rankings.” <https://www.wri.org/data/aqueduct-30-country-rankings>

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About the Center for Sustainable Development at Brookings

The Center for Sustainable Development generates leading research, insights, and convening to advance the economic, social, and environmental challenges of global sustainable development and help implement the Sustainable Development Goals (SDGs) within and across all countries.

To set a more robust global path to net-zero emissions by 2050, the world needs to pay greater attention to the needs of emerging markets and developing economies (EMDEs), even when holding aside the special case of China. Over the coming several decades, no part of the world will play a greater role in both experiencing and affecting global climate change outcomes than EMDEs themselves. They need greater international support to tackle growth-enhancing sustainable development strategies.

In *Keys to Climate Action*, twenty-five authors describe new economic narratives and global actions that can help catalyze progress toward inclusive, sustainable, and resilient growth in EMDEs. The volume begins with the stark reality of climate change's devastating consequences already hindering economic development around the world. It underscores the need for urgent investments in adaptation, resilience, and nature to avoid development setbacks while paying heed to the world's narrow window for climate action. It requires empathy for many developing countries' profound energy conundrum: a tension between the need to expand access for people who need it most while facing pressures to pursue low-carbon opportunities, often in the face of local political and financing headwinds. It implies practical urgency in tackling the broken threads of the international financing system for climate and development.

The volume brings together a cross-section of distinguished academics and leading policy voices from a variety of developing country geographies and contexts. It presents perspectives on the country-specific climate and development challenges and opportunities in Bangladesh by **SALEEMUL HUQ** and **MIZAN KHAN**, Egypt by **HALA ABOU-ALI**, **AMIRA ELAYOUTY**, and **MAHMOUD MOHIELDIN**, India by **MONTEK SINGH AHLUWALIA** and **UTKARSH PATEL**, Indonesia by **MUHAMAD CHATIB BASRI** and **TEUKU RIEFKY**, Nigeria by **BELINDA ARCHIBONG** and **PHILIP OSAFO-KWAAKO**, and South Africa by **RICHARD CALLAND**. Then, broader case studies focus on regional issues in East Africa by **NJUGUNA NDUNG'U** and **THÉOPHILE AZOMAHOU**, across the African continent as a whole by **VERA SONGWE** and **JEAN-PAUL ADAM**, in Latin America and the Caribbean by **DANIEL TITELMAN**, **MICHAEL HANNI**, **NOEL PEREZ BENITEZ**, and **JEAN-BAPTISTE CARPENTIER**, and among the Vulnerable Twenty Group of Ministers of Finance of the Climate Vulnerable Forum by **SARA JANE AHMED**. A final chapter by **MONTEK SINGH AHLUWALIA** and **UTKARSH PATEL** focuses on systemic issues in financing development and climate-driven prosperity.

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